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# **SCHEDULE OF RATES - 2019**

## **ROAD CONSTRUCTION DEPARTMENT**



**AIIMS – Digha Elevated Corridor**

PUBLISHED BY STATE LEVEL SCHEDULE RATE COMMITTEE  
BIHAR, PATNA

Effective from 01.04.2019

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बिहार सरकार

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GOVERNMENT OF BIHAR

पथ निर्माण विभाग

(राष्ट्रीय उच्च पथ उपभाग सहित)

**Road Construction Department**  
(Including National Highway Wing)

अनुसूचित दर (दर विश्लेषण सहित)  
**Schedule of Rates with Analysis**  
(Fourteenth Edition)

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## प्रस्तावना


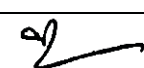


बिहार लोक निर्माण संहिता की कण्डिका-103 के संशोधन के आलोक में बिहार सरकार, पथ निर्माण विभाग द्वारा निर्गत संकल्प सह पठित ज्ञापांक 1/बी-12-2003-5762 (एस) डबलू ई0 पटना दिनांक 05.06.2006 की कण्डिका 2 (iii) में यह प्रावधान किया गया है कि अनुसूचित दर का निर्धारण के लिए दर विश्लेषण तथा सामग्रियों का दर निर्धारण पथ निर्माण विभाग के संयोजन में गठित राज्य स्तरीय अनुसूचित दर निर्धारण समिति द्वारा किया जायेगा। इसी क्रम में यह प्रावधान किया गया है कि पथ निर्माण विभाग में अनुसूचित दर का निर्धारण सड़क, परिवहन एवं राजमार्ग, मंत्रालय भारत सरकार के स्टैण्डर्ड डाटा बुक के आधार पर किया जायेगा, जबकि अन्य विभागों में इससे संबंधित भारत सरकार के कार्य विभागों में प्रचलित विशिष्टियों या दर विश्लेषण के आधार पर किया जायेगा। वर्तमान में राज्य स्तरीय अनुसूचित दर निर्धारण समिति के सदस्य इस प्रकार हैं :-

(I)	अभियंता प्रमुख, पथ निर्माण विभाग, बिहार, पटना	संयोजक
(ii)	अभियंता प्रमुख, ग्रामीण कार्य विभाग, बिहार, पटना	सदस्य
(iii)	अभियंता प्रमुख, भवन निर्माण विभाग, बिहार, पटना	सदस्य
(iv)	अभियंता प्रमुख, मुख्यालय, जल संसाधन विभाग, बिहार, पटना	सदस्य
(v)	अभियंता प्रमुख, लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना	सदस्य
(vi)	अभियंता प्रमुख, लघु जल संसाधन विभाग, बिहार, पटना	सदस्य
(vii)	अभियंता प्रमुख, तकनीकी परीक्षण कोषांग, निगरानी विभाग, बिहार, पटना	सदस्य
(viii)	मुख्य अभियंता (असैनिक), बिहार स्टेट पावर होल्डिंग कंपनी लि0, पटना	सदस्य
(ix)	मुख्य अभियंता (विद्युत), भवन निर्माण विभाग, बिहार, पटना	सदस्य

बिहार लोक निर्माण संहिता की कण्डिका-103 में संशोधन के आलोक में MORT&H Standard Data Book एवं Software पर आधारित पथ निर्माण विभाग (राष्ट्रीय उच्च पथ सहित) के लिए अनुसूचित दर पुस्त का प्रथम संस्करण दिनांक-05.12.2006 से लागू किया गया था।

समिति द्वारा पथ निर्माण विभाग (राष्ट्रीय उच्च पथ सहित) के लिए अनुसूचित दर पुस्त (दर विश्लेषण सहित) में आवश्यक संशोधन एवं पुनरीक्षण के पश्चात् निम्नलिखित संस्करण किया गया :-

द्वितीय संस्करण	:	23.05.2007
तृतीय संस्करण	:	24.03.2008
चतुर्थ संस्करण	:	01.04.2009
पंचम संस्करण	:	01.04.2010
षष्ठम् संस्करण	:	01.05.2011
सप्तम् संस्करण	:	02.07.2012
अष्टम् संस्करण	:	01.04.2013
नवम् संस्करण	:	01.04.2014
दशम् संस्करण	:	01.04.2015
एकादश संस्करण	:	01.04.2016
द्वादश संस्करण	:	01.04.2017
त्रयोदश संस्करण	:	01.04.2018

समिति द्वारा द्वादश संस्करण में आवश्यक संशोधन एवं पुनरीक्षण के पश्चात् इसके त्रयोदश संस्करण दिनांक-01.04.2018 को किया गया।

चतुर्दश संस्करण करने के लिए राज्य अनुसूचित दर निर्धारण समिति की बैठक दिनांक-26-02-2019 को आहूत की गई।

दिनांक-26-02-2019 के बैठक में उपस्थित सभी सदस्यों द्वारा कुछ संशोधन के साथ अनुसूचित दर पुस्तिका को दिनांक-01.04.2019 से चतुर्दश संस्करण को लागू करने में अपनी सहमति दी।

इस पुस्तिका के संस्करण के पश्चात् भी समय-समय पर निर्माण सामग्री यथा बिटुमेन, सीमेंट, स्टील इत्यादि के दरों में होनेवाली घटोत्तरी-बढ़ोत्तरी को देखते हुए लगभग तीन माह पर राज्य स्तरीय अनुसूचित दर निर्धारण समिति की बैठक होती है जिसमें उनके द्वारा दरों को अद्यतन किया जाता है। इसके साथ ही साथ विभिन्न विभागों, संस्थाओं एवं कार्यालयों से प्राप्त सुझावों एवं प्रस्तावों के आधार पर समुचित निर्णय लिये जाते हैं जिन्हे विभागीय वेबसाइट [www.rcd.bih.nic.in](http://www.rcd.bih.nic.in) पर भी उपलब्ध कराये जाते हैं।

अतः इस पुस्तिका का उपयोग करनेवाले सभी पदाधिकारियों, व्यक्तियों, संस्थाओं, निगमों से अनुरोध है कि समय-समय पर विभागीय वेबसाइट का अवलोकन करते रहें।

बिहार लोक निर्माण संहिता की कण्डिका-103 के संशोधन के पश्चात् MORT&H Standard Data Book एवं Software पर आधारित अनुसूचित दर पुस्त का यह चतुर्दश संस्करण है। यद्यपि यह सभी सदस्यों की देख-रेख में तैयार किया गया है, फिर भी ऐसी संभावना है कि इस अनुसूचित दर पुस्त को तैयार करने में कुछ त्रुटियाँ रह गई हो और व्यवहार में लाने के क्रम में कुछ त्रुटियाँ दृष्टिगोचर हो सकती है, ऐसी स्थिति में मेरा अनुरोध है कि उन त्रुटियों को राज्य स्तरीय अनुसूचित दर निर्धारण समिति की जानकारी में E-mail [ID-sorrccd2012@gmail.com](mailto:ID-sorrccd2012@gmail.com) / पत्र/ दूरभाष-0612 2545514 द्वारा अथवा व्यक्तिगत रूप से अविलम्ब दी जाय ताकि सम्यक विचारोपरान्त उन त्रुटियों का समुचित निराकरण किया जा सके।

**चूँकि यह दर विश्लेषण सड़क निर्माण के उच्च एवं आधुनिक तकनीक पर आधारित है। अतः Users को परामर्श दिया जाता है कि उनके द्वारा सम्बन्धित कार्यमद का दर विश्लेषण एवं विशिष्टि का गहन अध्ययन अवश्य किया जाय।**

वर्तमान अनुसूचित दर पुस्त को तैयार करने तथा उसे प्रभावी बनाने में सहयोग करने के लिए निम्नलिखित पदाधिकारियों एवं कर्मचारियों का कार्य अत्यन्त ही सराहनीय रहा है:-

1. ई0 सोहैल अख्तर, अधीक्षण अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग पटना।
2. ई0 श्याम कुमार, तकनीकी सलाहकार, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
3. ई0 श्रीमन नारायण शर्मा, कार्यपालक अभि०, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
4. ई0 सुनील कुमार, कार्यपालक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
5. ई0 संजू कुमारी, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
6. ई0 संजीव कुमार, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
7. ई0 प्रियंका कुमारी, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
8. ई0 रामनाथ प्रसाद, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
9. ई0 दिनेश कुमार, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
10. ई0 अजय कुमार, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
11. सुश्री नायला नयाब, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
12. ई0 राम दुलार राम, कनीय अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।

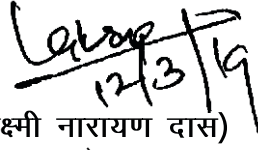
13. ई0 जयचन्द्र लाल, कनीय अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
14. ई0 विमलेश्वर कुमार सिन्हा, कनीय अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
15. श्री मो0 कमालउद्दीन अशरफ, सहायक, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।

राज्य स्तरीय अनुसूचित दर निर्धारण समिति यांत्रिक उपभाग के प्रभारी मुख्य अभियंता, श्री अशोक कुमार, अधीक्षण अभियंता, श्री सईद आलम एवं कार्यपालक अभियंता, श्री संजीव कुमार सिन्हा के प्रति आभार व्यक्त करता है जिनके सहयोग एवं रचनात्मक सुझाव से अनुसूचित दर पुस्त के इस संस्करण में विशेष सहयोग मिला है।

अनुसूचित दर पुस्त के उपयोग करनेवालों के विशेष सुविधा के लिए इस अनुसूचित दर पुस्तक के साथ Soft Copy (C.D.) भी संलग्न की जा रही है। साथ ही साथ यह अनुसूचित दर पुस्त विभागीय वेबसाइट [www.rcd.bih.nic.in](http://www.rcd.bih.nic.in) पर भी उपलब्ध है।

यह अनुसूचित दर पुस्त दिनांक 01.04.2019 से प्रभावी होगा।

स्थान— पटना  
दिनांक—

  
(लक्ष्मी नारायण दास)  
संयोजक

राज्य स्तरीय अनुसूचित दर निर्धारण समिति  
—सह— अभियंता प्रमुख  
—सह—अपर आयुक्त—सह—विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।



**MORT&H Standard Data Book एवं इसके Software पर आधारित पथ निर्माण विभाग (राष्ट्रीय उच्च पथ सहित) के लिये अनुसूचित दर पुस्तिका (दर विश्लेषण सहित) के चतुर्दश संस्करण का राज्य स्तरीय अनुसूचित दर निर्धारण समिति द्वारा अनुमोदन :-**

बिहार लोक निर्माण संहिता की कण्डिका-103 में संशोधन के आलोक में बिहार सरकार, पथ निर्माण विभाग द्वारा निर्गत संकल्प सह पठित ज्ञापांक 1/बी0-12/2003-5762 (एस) (डब्लू ई) पटना, दिनांक-05.06.2006 की कंडिका-2 (iii) में यह प्रावधान किया गया है कि अनुसूचित दर, दर विश्लेषण तथा सामग्रियों का दर निर्धारण पथ निर्माण विभाग के संयोजन में गठित राज्य स्तरीय अनुसूचित दर निर्धारण समिति द्वारा किया जायेगा। इसी क्रम में यह प्रावधान किया गया है कि पथ निर्माण विभाग में अनुसूचित दर का निर्धारण सड़क परिवहन एवं राजमार्ग मंत्रालय, भारत सरकार के स्टैन्डर्ड डाटा बुक के आधार पर किया जायेगा। राज्य स्तरीय अनुसूचित दर निर्धारण समिति द्वारा श्रमदर, निर्माण सामग्रियों एवं Plant & Machinery के दर में हुए दर पुनरीक्षण के आलोक में पथ निर्माण विभाग (राष्ट्रीय उच्च पथ सहित) के लिये लागू अनुसूचित दर (दिनांक 01.04.2019 से प्रभावी) के पुनरीक्षण के लिए दिनांक 26.02.2019 की बैठक में निर्माण सामग्री एवं Plant & Machinery के usage rate के लिए INPUT की स्वीकृति दी गयी है। सदस्यों की सहमति से पथ निर्माण विभाग (राष्ट्रीय उच्च पथ सहित) के लिए दिनांक 01.04.2018 से प्रभावी अनुसूचित दर पुस्त (दर विश्लेषण सहित)-त्रयोदश संस्करण में आवश्यक संशोधन एवं पुनरीक्षण के पश्चात् इसके चतुर्दश संस्करण (दिनांक-01.04.2019 से प्रभावी) का अनुमोदन किया जाता है। अनुसूचित दर तैयार करने में निम्नलिखित प्रक्रिया अपनाई गई है:-

- (i) राष्ट्रीय राजमार्ग एवं भूतल परिवहन मंत्रालय के लिए लागू डाटा बुक एवं सॉफ्टवेयर के Basic Approach/Guide Lines for Road & Bridges के आधार पर 10% Contractor's Profit शामिल किया गया है।
- (ii) राष्ट्रीय राजमार्ग एवं भूतल परिवहन मंत्रालय के लिए लागू डाटा बुक एवं सॉफ्टवेयर के Basic Approach/Guide Lines for Road & Bridges के आधार पर दर-विश्लेषण में Goods & Service tax (GST) लागू होने के उपरांत overhead charge में पूर्व से सम्मिलित 4% Sale tax/VAT को हटाते (Minus) हुए निम्न प्रकार से overhead charge लिए जाने का निर्णय लिया गया है :-
  - (a) Chapter 1 से 11 तक में ₹ 50 Crores तक के Road Projects के लिए Overhead charges 6% (10%-4%) लिया गया है।
  - (b) Chapter 12 से 15 तक में Major Bridges के लिए Overhead charges 21% (25%-4%) लिया गया है।
  - (c) Chapter 16 में Repair & Rehabilitation Work में Overhead charges 26% (30%-4%) लिया गया है।
- (iii) राष्ट्रीय राजमार्ग एवं भूतल परिवहन मंत्रालय के लिए लागू स्टैन्डर्ड डाटा बुक में दिये गये Guidelines for Road & Bridges के अनुसार Road Works के लिए ₹ 50 Crores से ऊपर के कार्य के लिए 8% Overhead charges एवं Minor Bridges included in the Road Packages के लिए Overhead charges 20% का प्रावधान रखा गया है, परंतु वर्तमान में GST (Goods & Services tax) लागू होने के कारण Road works के लिए 50 Crores



से उपर के कार्य के लिए 4% (8%-4%) overhead charges एवं Minor Bridges included in the Road Packages के लिए overhead charges 16% (20%-4%) लिया गया है। अतएव दर विश्लेषण के विभिन्न Chapters के कार्यमद दर विभिन्न स्थितियों में निम्नलिखित Factor को कार्यमद दर से Multiply किया जाय :-

(A)

- (a) Chapter 1 से 11 तक में जिसमें ₹50 Crores तक के Road project का दर है उसमें Overhead charges 6% एवं CP 10% के आधार पर दर तैयार किया गया है, इसमें Multiplying Factor लागू नहीं होगा।
- (b) यदि Road project का cost ₹ 50 Crores से ज्यादा हो तो Overhead charges 4% एवं CP 10% देय होने के कारण (a) के दर में Multiplying Factor 0.981 होगा।

(B)

- (a) Chapter 12 से 15 तक Major Bridge including state of Art Bridge और Minor Bridge के लिए Overhead charges 21% एवं CP 10% के आधार पर दर तैयार किया गया है, इसलिए इन कार्यों के लिए इसमें Multiplying Factor लागू नहीं होगा।
- (b) Chapter 12 से 15 का मद (जिसमें OH 21% एवं CP 10% है) का इस्तेमाल ₹50 करोड़ रुपये के लागत के अन्तर्गत पथ कार्य (जिसमें OH 6% एवं CP 10% देय होगा) के लिये उपयोग में लायी जाती है, तो उक्त मद के दर में Multiplying Factor 0.876 होगा।
- (c) Chapter 12 से 15 का मद (जिसमें OH 21% एवं CP 10% है) का इस्तेमाल ₹50 करोड़ रुपये से अधिक लागत के पथ कार्य (जिसमें OH 4% एवं CP 10% देय होगा) के लिये उपयोग में लायी जाती है, तो उक्त मद के दर में Multiplying Factor 0.860 होगा।
- (d) Chapter 12 से 15 का मद (जिसमें OH 21% एवं CP 10% है) का इस्तेमाल Minor bridges included in Road Project (जिसमें OH 16% एवं CP 10% देय होगा) के लिये उपयोग में लायी जाती है, तो उक्त मद के दर में Multiplying Factor 0.959 होगा।

(C)

Chapter 16 में Repair & Rehabilitation Work of Bridge में Overhead charges 26% एवं CP 10% के आधार पर दर तैयार किया गया है, इसमें Multiplying Factor लागू नहीं होगा।

(D)

भविष्य में परियोजनाओं के DPR तैयार करने के क्रम में यदि किसी परियोजना में पथ कार्य के साथ Bridge कार्य भी सम्मिलित है, तो पथ कार्य में नियमानुसार लागू overhead (OH) तथा Bridge कार्य (Chapter 12 से 15 तक) में MORT&H के Standard Data Book के अनुरूप नियमानुसार लागू overhead (OH) मद का प्रावधान करते हुए प्राक्कलन का सृजन किया जाय।

(iv)

- (a) सिमेन्ट के दर में पटना के लिये लागू OPC Grade 43 के दर को व्यवहार में लाया गया है। निरूपण एवं संरचना की आवश्यकतानुसार संबंधित सक्षम पदाधिकारी अन्य प्रकार के सिमेंट का व्यवहार कर सकते हैं।



- (b) स्टील के दर में TMT Bar के लिये Fe 500 HYSD के दर को दर विश्लेषण के लिए व्यवहार में लाया गया है।
- (c) बिटुमेन के लिए Packed 60/70(VG30) ग्रेड एवं Packed 80/100(VG 10) ग्रेड Ex-Barauni का दर व्यवहार में लाया गया है। Bitumen Emulsion RS-1 Packed Ex-Patna, Modified Graded Bitumen CRMB-55 Packed Ex-Barauni एवं Bitumen (Cutback) Packed Ex-Barauni के दर को दर विश्लेषण में लिया गया है।
- (d) M-197 में Ex- Patna VG-40 के दर को विश्लेषण में लिया गया है।
- (e) Brick 100 "A" का दर Patna Urban के लिये लागू दर को व्यवहार में लाया गया है।
- (v) (a) खान एवं भूतत्व विभाग, बिहार सरकार, पटना के ज्ञापांक-प्र0-1(विविध) बैठक-15/17-285/एम0, पटना दिनांक-15.01.2018 एवं ज्ञापांक-7020 दिनांक-14-11-2017 के आलोक में Coarse Sand का Schedule-M/MORTH-1 के M-004 एवं M-005 के अनुसार अनुमोदित दर को व्यवहार में लाया गया है।

संबंधित सक्षम पदाधिकारी निर्माण कार्यक्षेत्र के जोन के अनुसार ही **Bitumen/ Cement/ Brick/Coarse Sand** के निर्धारित दर का प्रयोग करेंगे और इसके अनुसार दर में अन्तर की राशि को प्राक्कलन में जोड़ेगे या घटायेगें।

- (b) TMT Bars, Mild Steel bars एवं Structural Steel के भिन्न आकार/व्यास का व्यवहार निर्माण कार्यों में किया जाता है। इसे अनुसूचित दर विश्लेषण में अधिसूचित दर के औसत दर को व्यवहार में लिया गया है। संबंधित सक्षम पदाधिकारी द्वारा वास्तविक निरूपण के आधार पर भिन्न व्यास/आकार प्रकार के स्वीकृत दरों को आवश्यकतानुसार व्यवहार में लाया जा सकता है।
- (c) TATA, SAIL RINL एवं Shyam Steel Industries Ltd, Kolkata से प्राप्त दर पर राज्यस्तरीय अनुसूचित दर निर्धारण समिति द्वारा विचार-विमर्श कर स्टील का दर अनुमोदित करने का निर्णय लिया गया। इन्हीं चार कम्पनियों यथा TATA, SAIL RINL एवं Shyam Steel Industries Ltd, Kolkata के स्टील का प्रयोग निर्माण कार्यों में किया जाना है।
- (vi) (a) अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव, पथ निर्माण विभाग, बिहार, पटना के पत्रांक-प्र0-7/विविध-101/2017-3082 (ई), पटना दिनांक-27.04.2018 के आलोक में Royalty का प्रावधान खान एवं भूतत्व विभाग की अधिसूचना संख्या-245, पटना दिनांक-27.01.2012 एवं अधिसूचना संख्या-250 दिनांक-27.01.2012 के अनुसार किया गया है। रॉयल्टी की कटौती विपत्रों से Loose Volume of Materials पर की जानी है न कि Finished Volume of Materials (Compacted Volume) पर, जिसका अनुपालन सुनिश्चित करने की जिम्मेवारी क्षेत्रीय पदाधिकारियों की होगी।
- (b) जब तक MORT&H, भारत सरकार का Standard Data Book update होकर प्राप्त नहीं हो जाता है तब तक Goods& Services tax (GST) की प्रक्रिया समिति द्वारा सर्वसम्मति से विचारोपरांत निम्न प्रकार से अपनाने का निर्णय लिया गया है :-



- (i) MORT&H के वर्तमान Standard Data Book में overhead (OH) मद में सम्मिलित 4% VAT/Sale tax को दर-विश्लेषण से हटा दिया जाय।
- (ii) दर-विश्लेषण में प्रयुक्त प्रत्येक सामग्री की दर में GST नहीं जोड़ा जाए।
- (iii) Carriage overhead charge (excluding 4% VAT/Sale tax), Contractor profit, Royalty को जोड़कर प्रत्येक कार्य मद का दर निर्धारित किया जाए तथा इस निर्धारित दर के आधार पर परियोजना की प्राक्कलित राशि निर्धारित की जाए।
- (iv) Work-Contracts के लिए उपरोक्त कंडिका-(iii) में निर्धारित प्राक्कलित राशि/कुल लागत (Labour Cess रहित) पर Contractor Service tax/work contract G.S.T. का प्रावधान वित्त मंत्रालय, भारत सरकार की अधिसूचना संख्या-20/2017-Central Tax (Rate), नई दिल्ली दिनांक-22-08-17 में निर्मित तालिका के कॉलम-4 में निर्धारित G.S.T. (C.G.S.T.& S.G.S.T. मिलाकर जो वर्तमान में 12% है) तथा समय-समय पर भारत सरकार एवं राज्य सरकार द्वारा अधिसूचित कर की दर के अनुसार किया जाय।

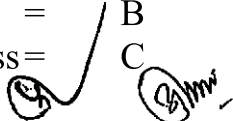
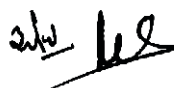
परन्तु "For composite supply of work contract as defined in clause (119) of section 2 of the Central Goods & Services Tax Act 2017, involving predominantly earth work (That is, constituting more than 75% of the value of work contract) provided to the central Government, Union Territory, State Government, local Authority, a Government Authority or a Government Entity, the Goods & Services Tax (GST) for contract is 5% (CGST=2.5%, SGST=2.5%) only and as per revised GST Rates by the respective Government Authority time to time".

- (v) उपरोक्त कंडिका-(iii) में निर्धारित प्राक्कलित राशि (G.S.T रहित) पर 1% Labour Cess का प्रावधान निर्धारित मापदण्डों के अनुसार किया जाय।
- (vi) Bill of Quantity (B.O.Q.) में work value, labour less value एवं G.S.T. value का अलग-अलग उल्लेख किया जाय।

तत्संबंधी उदाहरण तालिका (Model Calculation Sheet) निम्न प्रकार है :-

- (a) Estimated Amount (प्राक्कलित राशि) including carriage, overhead charge (excluding 4% VAT/Sale Tax), Contractor profit, Royalty but excluding GST & Labour Cess="A"
- (b) Contractor Service Tax/Work Contract GST in percentage="Y" %
- (c) Contract Service tax/contract GST Amount  

$$= \text{"B"} = \frac{AY}{100}$$
- (d) Labour Cess Amount@1% = "C" =  $A \times 0.01$
- (e) Bill of Quantity (B.O.Q.)  
 Work Value = A  
 GST Value = B  
 Labour Cess = C


विश्लेषित दर में किसी तरह का G.S.T. शामिल नहीं है।

- (c) राज्य अनुसूचित दर निर्धारण समिति द्वारा MORD (Ministry of Rural Development) में दिये गये विश्लेषण के आधार पर 40-60TPH का दर विश्लेषण (with Mechanical Paver Finisher) Chapter -5B में दिया गया है जिस पर समिति के सदस्यों की सहमति प्राप्त है।

- (vii) श्रमिक कल्याण कोष हेतु 1% (एक प्रतिशत) सेस की कटौती से संबंधित श्रम विभाग, बिहार सरकार के पत्रांक 4984 दिनांक-01.10.2008 एवं संयोजक-सह-अभियंता प्रमुख के पत्रांक-746 (अनु0) दिनांक-25.02.2010 द्वारा दिये गये निर्देश का अनुपालन सुनिश्चित करने की जिम्मेवारी क्षेत्रीय पदाधिकारियों की होगी।

इस अनुसूचित दर पुस्त के दर विश्लेषण में 1%(एक प्रतिशत) सेस की राशि सम्मिलित नहीं किया गया है।

- (viii) रेलवे द्वारा निर्माण सामग्री की ढुलाई का दर निर्धारण हेतु रेल मंत्रालय (रेलवे बोर्ड) भारत सरकार, महाप्रबंधक (परिचालन)/वाणिज्य के पत्रांक-2009/टी-टी III/27/1, नई दिल्ली दिनांक-06.10.2009 के द्वारा माल ढुलाई हेतु Route Chart उपलब्ध कराया है जिसे क्षेत्रीय पदाधिकारी जाँचोपरांत व्यवहार में लायेंगे। Route Chart की छाया प्रति इस अनुसूचित दर पुस्त में संलग्न कर दी गई है। Freight Rate से संबंधित रेल मंत्रालय भारत सरकार के पत्रांक-TCR/1078/2015/07, नई दिल्ली, दिनांक-31-10-2018 (Rate Circular No.-19 of 2018) एवं इस पत्र के साथ संलग्न Annexure-1, II & III के रूप में Freight Rate Table-2018 की प्रति इस अनुसूचित दर पुस्त में संलग्न कर दी गई है।

- (a) MORT&H Standard Data Book में दिये गये " Carriage of Materials" के Calculation के अलावे रेलवे द्वारा निर्माण सामग्री की ढुलाई पर समिति के सदस्यों द्वारा विचार विमर्श किया गया। सर्वसम्मति से पूर्णविचारोपरान्त, सदस्यों द्वारा यह निर्णय लिया गया कि वैसे स्थल जहाँ पर रेलवे के द्वारा निर्माण सामग्रियों की ढुलाई संभव हो वहाँ पर Road एवं Railway दोनों के द्वारा Carriage of Materials का दर प्राप्त किया जाय तथा दोनों में से न्यूनतम दर को ही प्रयोग में लाया जाय।

The maximum lead to be considered as per T.E.C. Norms is as follows-

- (i) For local Sand 3 Km with 1 km kuchcha road.  
(ii) For brick 8 km with 1 km kuchcha road.  
(iii) For Coarse Sand, Stone Metal, Stone chips, Moorum, Stone Boulder, Bitumen as per actual lead with Provision of kuchcha lead as per requirement of site condition.

- (ix) Chapter 5A में 100-120 TPH with Mechanical Paver finisher (For different items) का दर विश्लेषण किया गया है, जिस पर समिति के सदस्यों की सहमति प्राप्त है।



- (x) इसके पूर्व में भी समय-समय पर अनुसूचित दर में "संशोधित दर" प्रकाशित किया गया है जिसका समायोजन इस अनुसूचित दर पुस्तिका में कर लिया गया है।

Chapter-1 (Carriage of Materials) में दिये गये दरों में Contractor's profit (10%) and Overhead charges 6% (10%-4%) include कर दिया गया है।

1. बिटुमेन से संबंधित दर :-

अनुसूचित दर के पुनरीक्षण के क्रम में राष्ट्रीयकृत कम्पनी Indian Oil Corporation, Bharat Petroleum एवं Hindustan Petroleum Corporation से दर प्राप्त हुआ है। Emulsion MS/RS-1/SS-1 Packed का दर Hindustan Petroleum Corporation Ltd. से प्राप्त हुआ है। समिति द्वारा इन कम्पनियों से प्राप्त दर में GST को घटाकर विभिन्न Grades के Bitumen का दर अनुमोदित करने का निर्णय लिया गया। समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, संलग्न अनुसूची "M4" के अनुसार बिटुमेन के विभिन्न Grades/प्रकार के दर को अनुमोदित किया गया।

2. सिमेंट का दर :-

- (i) **Ordinary Portland Cement (43 Grade)** का दर विभिन्न कंपनियों से प्राप्त हुआ है। इस दर में शामिल GST को घटाकर प्रति बोरा दर अनुमोदित करने का निर्णय लिया गया। पटना के न्यूनतम दर के आधार पर, पूर्व से निर्धारित दर के अनुपात में अन्य जोनों के लिए दर प्राप्त किया गया। समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, संलग्न अनुसूची "M1" के दर को अनुमोदित करने का निर्णय लिया गया।
- (ii) **Ordinary Portland Cement (33 Grade)** का दर किसी भी सीमेंट निर्माता कम्पनी से प्राप्त नहीं हुआ है। समिति के द्वारा इसपर विस्तार से विचार-विमर्श किया गया तथा समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, दिनांक-18.01.2018 को आहूत राज्यस्तरीय अनुसूचित दर निर्धारण समिति की बैठक में बिना GST के अनुमोदित अनुसूची "M2" के दर को व्यवहार में लाने का निर्णय लिया गया।
- (iii) **Portland Pozzolona Cement (PPC)** का दर विभिन्न कंपनियों से प्राप्त हुआ है। इस दर में शामिल GST को घटाकर प्रति बोरा दर अनुमोदित करने का निर्णय लिया गया। समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, संलग्न अनुसूची "M3A" के दर को अनुमोदित किया गया।
- (iv) **Portland Slag Cement (PSC)** का दर सीमेंट निर्माता कम्पनी से प्राप्त हुआ है। इस दर में शामिल GST को घटाकर प्रति बोरा दर अनुमोदित करने का निर्णय लिया गया। P.S.C. के लिए प्राप्त पटना के न्यूनतम दर के आधार पर, पूर्व से निर्धारित दर के अनुपात में अन्य जोन के दरों को भी निर्धारित करने का निर्णय लिया गया। समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, संलग्न अनुसूची "M3B" के अनुसार P.S.C. के दर को अनुमोदित किया गया।
- (v) **Portland Composite Cement PCC (IS 16415:2015)** का दर विभिन्न कम्पनियों से प्राप्त हुआ है। इस दर में शामिल GST को घटाकर प्रति बोरा दर अनुमोदित करने का निर्णय लिया गया। समिति के द्वारा सर्वसम्मति से पूर्ण विचारोपरान्त संलग्न अनुसूची "M3C" के अनुसार PCC के दर को अनुमोदित किया गया।

3. **Steel से संबंधित निर्माण सामग्रियों का दर :-**

- a. **G.C. Sheet** का दर :- G.C. Sheet का दर TATA एवं SAIL से प्राप्त हुआ है। तदनुसार TATA एवं SAIL से प्राप्त न्यूनतम दर बिना GST के समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, अनुसूची "M5" के अनुसार अनुमोदित करने का निर्णय लिया गया।
- b. **Wire rod in coil** :- Wire rod in coil के भिन्न भिन्न व्यास का दर RINL से प्राप्त हुआ है। इसपर समिति के सदस्यों द्वारा विचार-विमर्श किया गया तथा RINL से प्राप्त दर बिना GST के समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, अनुसूची "M6" के अनुसार अनुमोदित करने का निर्णय लिया गया।
- c. **Steel Channel** का दर :- Steel Channel का दर RINL से प्राप्त हुआ है, तदनुसार RINL से प्राप्त न्यूनतम दर बिना GST के समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, अनुसूची "M8" के अनुसार अनुमोदित करने का निर्णय लिया गया।
- d. **Steel Angles** का दर :- भिन्न-भिन्न आकार वाले Steel Angles का दर RINL से प्राप्त हुआ है। तदनुसार RINL से प्राप्त न्यूनतम दर बिना GST के समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, Schedule "M9" के अनुसार अनुमोदित करने का निर्णय लिया गया।
- e. **TMT Bar (Fe 500)** का दर :- TMT Bar का दर TATA, RINL SAIL एवं Shyam Steel Industries Ltd. से प्राप्त हुआ है। TATA, RINL, SAIL एवं Shyam Steel Industries Ltd. से प्राप्त न्यूनतम दर बिना GST के समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, Schedule "M10A" के अनुसार अनुमोदित करने का निर्णय लिया गया।
- f. **Schedule M7:-** यह Steel Joist से संबंधित है। वर्तमान में इसका निर्माण SAIL, TATA, RINL द्वारा नहीं किया जा रहा है अतः इसका वर्तमान में इस्तेमाल नहीं होने तथा दर के अनुपलब्धता के कारण इस पुस्तिका से विलोपित किया जा रहा है।

4. **Plant & Machinery का Usage charge के दर पुनरीक्षण के संबंध में।**

Plant & Machinery के अन्तर्गत 101 मद हैं , जिनमें से पथ निर्माण कार्य में प्रयुक्त होनेवाले मशीनों जिनके Item no:- P&M002, P&M-010, P&M017, P&M-018, P&M-021, P&M-022, P&M-023, P&M-024, P&M-031, P&M-032, P&M-034, P&M-035 , P&M-044, P&M-048, P&M-059, P&M-080 , P&M-081, P&M-094, तथा WMM Paver finisher, Tipping Truck 14cum, 6.5KVA Generator, Vibratory Earth Compactor, Tractor (25HP), 5KVA Generator एवं Mini Hot mix Plant (6-10) TPH के दर का पुनरीक्षण यांत्रिक उपभाग, पथ निर्माण विभाग से प्राप्त प्रस्ताव के अनुसार राज्य स्तरीय अनुसूचित दर निर्धारण समिति की बैठक में अनुमोदित करने का निर्णय लिया गया। शेष मशीनों के मदों के Usage Charges के दर का पुनरीक्षण हेतु यांत्रिक उपभाग, पथ निर्माण विभाग/लोक स्वास्थ्य अभियंत्रण विभाग/जल संसाधन विभाग तथा भवन निर्माण विभाग, बिहार, पटना को अनेकों बार लिखित एवं मौखिक अनुरोध के बावजूद भी दर प्राप्त नहीं होने के कारण कार्यहित में पूर्व प्रधान सचिव श्री आर0 के0 सिंह द्वारा संचिका सं0- मु0 नि0 (पथ-08/2006) पृष्ठ 10 से 12) में दिये गये निर्देश के आलोक में Plant & Machinery के शेष मदों (P&M-003, P&M-009, एवं P&M-047 को छोड़कर ) के दर का पुनरीक्षण किया गया है। इसमें Usage Charges के दर में इसके विभिन्न Components यथा Ownership Charges, Operational Charges,





POL Charges & Establishment Charges का मान क्रमशः 20%, 30%, 25% एवं 25% रखने का निर्णय राज्य स्तरीय अनुसूचित दर निर्धारण समिति के द्वारा दिनांक-05.12.2006 के बैठक में लिया गया था, जिसके आधार पर इन विभिन्न Components के RBI द्वारा निर्गत Wholesale Price Index के moving average में हुए बढ़ोत्तरी/घटोत्तरी के अनुसार Usage Charges के दर में Weighted mean की गणना के आधार पर अद्यतन करने का निर्णय लिया गया।

उक्त गणना से आकलित Usage Charges में 2017-18 के दर में औसतन 5.362% की बढ़ोत्तरी एवं शेष मशीनरी मदों में (P&M-003, P&M-009 एवं P&M-047 को छोड़कर) Usage Charges में बढ़ोत्तरी करते हुए दर पुनरीक्षित करने पर सदस्यों द्वारा सर्वसम्मति से निर्णय लिया गया।

P&M-003 (Batching & Mixing plant 15-20cum capacity) का दर P&M-002(Batching & Mixing plant 30cum capacity) के पुनरीक्षित दर रू0 2851 प्रति घंटा के आधार पर उनके Output के अनुरूप Pro-data basis से  $2851 \times (13/20) = 1853/\text{hr}$  निर्धारित करने पर सर्वसम्मति से निर्णय लिया गया।

P&M-009 (Concrete Mixer 0.4/0.28cum capacity) का दर P&M-10 (Concrete Mixer 01 cum capacity) के पुनरीक्षित दर रू0 247 प्रति घंटा के आधार पर उनके Output के अनुरूप Pro-data basis से  $(247 \times 2.5/7.5) = 82.30/\text{hr}$  निर्धारित करने का निर्णय लिया गया।

इस संबंध में विशेष सुझाव हेतु सड़क पोत परिवहन एवं राष्ट्रीय राज्य मार्ग मंत्रालय के Director General (Roads) cum Special Secretary को भी संयोजक, राज्य अनुसूचित दर निर्धारण समिति के द्वारा पत्रांक सं0-26 (अनु0) दिनांक-04.02.13 के माध्यम से अनुरोध किया गया है।

#### P&M-047 Tipper 5cum का Tonne-km दर

वर्ष 2001-02 में per tonne - km दर	Rs. 1.74
वर्ष 2001-02 में per hr per tipper(5 cum capacity) दर	Rs. 200.00
वर्ष 2017-18 में per hr per tipper(5 cum capacity) दर	Rs. 1018.00

वर्ष 2018-19 में पुनरीक्षित दर Per tonne-km में  $\text{Rs. } 1018 \times 1.74/200 = 8.83$

P&M-047 Tipper (5cum capacity) के लिये उक्त तरीके से प्राप्त per Tonne-km दर ₹8.86 को अनुमोदित करने का निर्णय लिया गया।

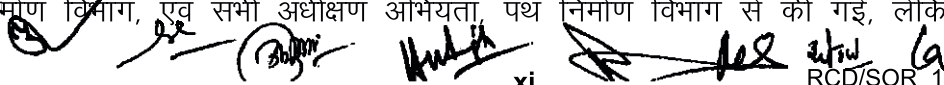
WMM Plant 100 TPH(P&M-093) के दर को पूर्व की भाँति WMM Plant 75 TPH(P&M-094) के दर के सामान ही रखने पर सदस्यों द्वारा सहमति व्यक्त की गई।

#### **5. Carriage का दर पुनरीक्षण के संबंध में :-**

Carriage of materials by Tipper & Tractor :- MORT&H Standard Data Book के Chapter-1 के Item no. 1.1, 1.2, 1.3, 1.4(i), 1.4(ii) and 1.4(iii) को अद्यतन मशीनरी दर एवं श्रम दर के आधार पर संलग्न अनुसूची "Carriage of Materials by Tipper" and "Carriage of Materials by Tractor" के अनुसार पुनरीक्षित करने पर सर्वसम्मति से सदस्यों द्वारा अनुमोदित करने का निर्णय लिया गया।

#### **6. ईट एवं ईट से संबंधित निर्माण सामग्रियों का दर पुनरीक्षण :-**

विभिन्न ग्रेड के ईट एवं ईट से संबंधित निर्माण सामग्रियों के दर की मांग अभियंता प्रमुख, भवन निर्माण विभाग, एवं सभी अधीक्षण अभियंता, पथ निर्माण विभाग से की गई, लेकिन कहीं से भी दर



की प्राप्ति नहीं हुई। जिसके आलोक में RBI द्वारा निर्गत Plain Bricks के Wholesale Price Index के moving average के आधार पर बिना GST के ईट के दर में संशोधन करने का निर्णय सदस्यों द्वारा लिया गया।

**7. स्टोन एवं स्टोन चीप्स से संबंधित निर्माण सामग्रियों का दर पुनरीक्षण :-**

पथ निर्माण विभाग (राष्ट्रीय उच्च पथ सहित) के लिए दिनांक-01.04.2019 से प्रभावी अनुसूची दर में व्यवहृत स्टोन बोल्टर, मेटल्स एवं विभिन्न आकार के चीप्स के दरों को राज्य स्तरीय अनुसूचित दर निर्धारण समिति के द्वारा RBI से निर्गत Stone, Chip के Wholesale Price Index (मूल्य सूचकांक) के Moving Averages के आधार पर Aggregate का दर M-01 से M-55 तक (M-004 एवं M-005 को छोड़कर) के दर को तदनुसार पूर्णविचारोपरान्त बिना GST के अनुसूची "Schedule-M/MORTH-1" के अनुसार अनुमोदित करने का निर्णय लिया गया।

**8. Coarse Sand का दर पुनरीक्षण - खान एवं भूतत्व विभाग, बिहार सरकार, पटना के ज्ञापांक-प्र0-1 (विविध) बैठक-15/17-285/एम0 पटना दिनांक-15.01.2018 एवं ज्ञापांक-7020, दिनांक-14-11-2017 के आलोक में Schedule-M/MORTH-1 के Item संख्या M-004 एवं M-005 पर अंकित Coarse Sand (Yellow Sand) के दर को समिति के सदस्यों द्वारा पूर्ण विचारोपरान्त अनुमोदित करने का निर्णय लिया गया।**

**9. MORT&H Standard Data Book के कार्य मदों में व्यवहृत विभिन्न निर्माण सामग्रियों (Schedule-M/MORTH-1A) के दर निर्धारण के संबंध में :-**

Schedule-M/MORTH-1A में निहित विभिन्न निर्माण सामग्रियों में से कई मदों को विभिन्न श्रेणियों में रखते हुए RBI द्वारा निर्गत Wholesale Price Index के moving average के आधार पर बिना GST के दर को अद्यतन किया गया है, जो निम्न प्रकार से है :-

Material Code	Name of Commodity	% Change
M-56	Asbestos Corrugated Sheet	2.16% Increase
M-57,58,131,132,146,190	Manufacture of paints	1.965% Increase
M-59,60	Aluminium alloy	3.63% Increase
M-61	Aluminium Metal	1.95% Increase
M-62,71,90,91,92,96,99,100,112,113,116,120,122,134,140,141,143,144,147,152,155,159,160,161,162,163,165,166,167,168,187,189	All Commodities	4.31% Increase
M-63,72,123,124,125,192	M.S. Wire rods	15.91% Increase
M-64,65, 88, 93,127,128,173,178	Alloy Steel Castings	4.053% Increase
M-66,67,68,69,70	Manufacturing of bearing, gear etc.	3.504 % Increase



M-80	Cost Iron, Castings	4.03% Increase
M-84,133	Fibres	5.208% Increase
M-86	Copper metals	8.924% Increase
M-87,103	Steel Structure	7.259% Increase
M-89	Non-metallic-heavy	64.44% Increase
M-94	Manufacture of electric equipments	1.804% Increase
M-95,97,98	Epoxy Liquid	10.12% Increase
M-101,102	Galvanised Iron Pipe	6.124% Increase
M-104	Gelatin	2.195% Decrease
M-105,106,107, 108, 109	Manufacture of made of up textile article	3.078% Increase
M-110,129,130,158	Bolts, Screw, Nuts & Bolts of Iron & Steel.	10.15% Increase
M-111	Injection Pump	1.317% Increase
M-114,115,138,139	Plastic tubes	0.73% Increase
M-117,118,137,164	Plastic Components	3.023% Increase
M-119	Stainless steel, bars and rods	8.36% Increase
M-121	Cordage/ ropes wire of jute & coir.	3.39% Decrease
M-135, 149,150,151	Manufacture of Article of Cement concrete	2.58% Increase
M-136	Insecticides.& Pesticides	3.162% Increase
M-142,148,169,182	Stone, Chips	1.17% Decrease
M-174, 175	Steel Pipes tube & pols	7.25% Increase
M-172	Steel drum & Barrels	10.275% Increase
M-176,177	Steel Cables	5.657% Increase
M-180	Plasticizer	9.17% Increase

M-184	Ceramic & utilities	4.929% Decrease
M-185,193,194, 196	Timber	1.103% Decrease
M-188	Lime & Calcium Carbonate	4.976% Increase
M-191	Alloy Steel wire rods	18.42% Increase
M-79	Plain Bricks	0.81% Decrease
M-199,201	Cement Concrete block	6.69% Increase

Kerb Stone (size 375mmx300mmx150mm) Input क्रम सं० M-200 के दर का विश्लेषण M-30 ग्रेड PCC के आधार पर करने का निर्णय लिया गया। इस आधार पर कार्य मदों में व्यवहृत विभिन्न निर्माण सामग्रियों का दर M-56 से M-201(M-198 को छोड़कर) तक के दर में तदनुसार पूर्णविचारोपरान्त अनुसूची " Schedule- M/MORTH-1A" के अनुसार अनुमोदित करने का निर्णय लिया गया।

**10. निर्माण कार्य (सड़के, बाँध तथा सिंचाई कार्य) में नियोजित विभिन्न श्रेणी के मजदूरों का संशोधित न्यूनतम दैनिक मजदूरी के दर पुनरीक्षण हेतु लिये गये निर्णय :-**

श्रम संसाधन विभाग, बिहार, पटना के अधिसूचना सं०-6770, दिनांक-26-09-2018 के आलोक में पथ निर्माण कार्य में प्रयुक्त 72 प्रकार के विभिन्न कर्मियों तथा बांध निर्माण एवं सिंचाई कार्य के लिये प्रयुक्त 71 प्रकार के कर्मियों के न्यूनतम दैनिक श्रम दर का अनुमोदन दिनांक-28-11-2018 की बैठक में सदस्यों द्वारा सर्वसम्मति से पूर्णविचारोपरान्त अनुसूची-I एवं II के अनुसार करने का निर्णय लिया गया तथा समिति के सदस्यों द्वारा निर्णय लिया गया कि यह दर भवन निर्माण, ग्रामीण कार्य विभाग, लोक स्वास्थ्य अभियंत्रण विभाग एवं अन्य कार्य विभाग के अंतर्गत कराये जानेवाले निर्माण कार्य के उपयोग में भी लाया जा सकता है।

**11. Fly Ash Brick:-**

दिनांक-08.07.2013 को अनुसूचित दर निर्धारण समिति की राज्यस्तरीय बैठक में Fly Ash Brick के दर को N.T.P.C. एवं B.M.T.P.C. के Guidelines के आधार पर अनुसूचित दर पुस्तिका में सम्मिलित किया गया था। उपरोक्त Guidelines के आधार पर Labour, Material तथा Machineries के बढ़े नये दर के अनुरूप की गई, दर विश्लेषण के आधार पर Fly Ash Brick का दर प्रति एक हजार 5008/-रु० GST छोड़कर आता है, जिसे "Schedule-M/MORTH-1A" के क्रम सं०-M-198 के अनुसार अनुमोदित करने का निर्णय लिया गया।


**12. MORT&H Specification for Roads and Bridges work के fifth revision पर आधारित MORT&H के Standard Data Book for analysis of Rates का revision प्रक्रियाधीन है। Standard Data Book for analysis of Rates के revision हुए बिना अनुसूचित दर पुस्त का दर विश्लेषण MORT&H Specification for Roads and Bridges work के fifth revision के अनुसार किया जाना संभव नहीं है। इस अनुसूचित**

दर पुस्त का दर विश्लेषण **Standard Data Book** के 1<sup>st</sup> revision के आधार पर ही करने का निर्णय पूर्णविचारोपरान्त सर्वसम्मति से समिति के सदस्यों द्वारा लिया गया।

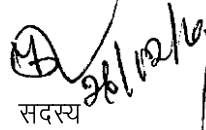
**13. Admixture :-**Batching, Plant, Transit Mixture एवं कंक्रीट पम्प के माध्यम से सीमेंट कंक्रीट की ढलाई करने पर आवश्यकतानुसार सक्षम प्राधिकार द्वारा अनुमोदित Design Mix की विशिष्टियों के अनुरूप Admixture (plasticizer, super plasticizer etc) का उपयोग किया जा सकता है तथा इसे तत्संबंधित मद-विशेष के दर विश्लेषण में पूर्व से Admixture शामिल नहीं रहने की स्थिति में सम्मिलित किया जा सकता है।

**14. नई अनुसूचित दर पुस्त का प्रकाशन के संबंध में विचार विमर्श :-**

पिछले वर्ष की भाँति इस वर्ष भी नये अनुसूचित दर पुस्त का प्रकाशन किया जाना है, जिस पर सदस्यों द्वारा विचार विमर्श किया गया तथा इसे दिनांक-01.04.2019 से लागू किये जाने का सर्वसम्मति से निर्णय लिया गया।

  
26/2/19  
सदस्य

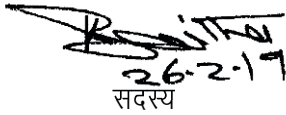
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बिहार, पटना।

  
सदस्य

राज्य स्तरीय अनुसूचित दर  
निर्धारण समिति-सह-अभियंता  
प्रमुख, ग्रामीण कार्य विभाग,  
बिहार, पटना।

सदस्य

राज्य स्तरीय अनुसूचित दर  
निर्धारण समिति-सह-अभियंता  
प्रमुख, लघु जल संसाधन  
विभाग, बिहार, पटना।

  
26.2.19  
सदस्य

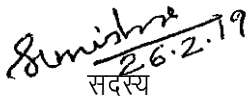
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निर्धारण समिति-सह-मुख्य  
अभियंता (असैनिक) बिहार  
स्टेट पावर होल्डिंग कंपनी  
लि0, बिहार, पटना।

  
सदस्य

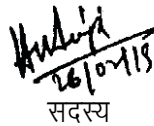
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निर्धारण समिति-सह-मुख्य  
अभियंता (विद्युत), भवन निर्माण  
विभाग, बिहार, पटना।

  
सदस्य

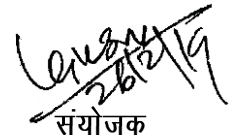
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निर्धारण समिति-सह-अभियंता  
प्रमुख, तकनीकी परीक्षण  
कोषांग, निगरानी विभाग, बिहार,  
पटना।

  
26.2.19  
सदस्य

राज्य स्तरीय अनुसूचित दर  
निर्धारण समिति-सह-अभियंता  
प्रमुख, लोक स्वास्थ्य अभियंत्रण  
विभाग, बिहार, पटना।

  
सदस्य

राज्य स्तरीय अनुसूचित दर  
निर्धारण समिति-सह-अभियंता  
प्रमुख, मुख्यालय, जल संसाधन  
विभाग, बिहार, पटना।

  
संयोजक

राज्य स्तरीय अनुसूचित दर  
निर्धारण समिति-सह-अभियंता  
प्रमुख-सह-अपर  
आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार,  
पटना।



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# LABOUR RATE

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**SCHEDULE - I**

**Dtd.: 28.11.2018**

**Approved Schedule of Rates for labour engaged in construction & maintenance of Roads**

Sl. No.	Category of Employees	Minimum Rates of wages per day as per					
		Lab. Deptt. Noti. No. 2787 /28.09.11	Lab. Deptt. Noti. No. 4971/ 29.11.16	Lab. Deptt. Noti. No. 1194/ 28.03.17	Lab. Deptt. Noti. No. 4835/ 15.09.17	Lab. Deptt. Noti. No. 1453/ 28.03.18	Lab. Deptt. Noti. No. 6770/ 26.09.18
1	2	3	4((1.43xcl3)*1.15)	5(1.02336xcl4)	6	7(1.03498xcl6)	8(1.00816xcl7)
1	Unskilled labour	144.00	237.00	242.00	247.00	254.00	257.00
2	Sweeper	144.00	237.00	242.00	247.00	254.00	257.00
3	Mistry	144.00	237.00	242.00	247.00	254.00	257.00
4	Cleaner	144.00	237.00	242.00	247.00	254.00	257.00
5	Helper	144.00	237.00	242.00	247.00	254.00	257.00
6	Khalsi/Chainman	144.00	237.00	242.00	247.00	254.00	257.00
7	Marker	184.00	302.00	309.00	309.00	320.00	323.00
8	Fitter grade-I	199.00	328.00	336.00	336.00	348.00	351.00
	Fitter grade-II	175.00	288.00	295.00	295.00	305.00	307.00
9	Turner	175.00	288.00	295.00	295.00	305.00	307.00
10	Mechanic grade-I	225.00	370.00	379.00	379.00	392.00	395.00
	Mechanic grade-II	209.00	344.00	352.00	352.00	364.00	367.00
11	Electrician grade-I	185.00	305.00	312.00	312.00	323.00	326.00
	Electrician grade-II	175.00	288.00	295.00	295.00	305.00	307.00
12	Lineman/Wireman	169.00	278.00	284.00	284.00	294.00	296.00
13	Chargeman	209.00	344.00	352.00	352.00	364.00	367.00
14	Foreman	247.00	406.00	415.00	415.00	430.00	434.00
15	Welder grade-I	220.00	362.00	370.00	370.00	383.00	386.00
	Welder grade-II	185.00	305.00	312.00	312.00	323.00	326.00
16	Glazier	164.00	270.00	276.00	276.00	286.00	288.00
17	Carpenter	175.00	288.00	295.00	295.00	305.00	307.00
18	Head Carpenter	196.00	322.00	330.00	330.00	342.00	345.00
19	Checker	177.00	291.00	298.00	298.00	308.00	311.00
20	Hammerman	153.00	252.00	258.00	258.00	267.00	269.00
21	Tin smith	199.00	328.00	336.00	336.00	348.00	351.00
22	Tin plate maker	209.00	344.00	352.00	352.00	364.00	367.00
23	Black Smith	175.00	288.00	295.00	295.00	305.00	307.00
24	Head black smith	196.00	322.00	330.00	330.00	342.00	345.00
25	Tile layer	155.00	255.00	261.00	261.00	270.00	272.00
26	Thatcher	155.00	255.00	261.00	261.00	270.00	272.00
27	Plumber	185.00	305.00	312.00	312.00	323.00	326.00
28	Grader	177.00	291.00	298.00	298.00	308.00	311.00
29	Road binder	164.00	270.00	276.00	276.00	286.00	288.00
30	Mason	175.00	288.00	295.00	295.00	305.00	307.00
31	Head Mason	196.00	322.00	330.00	330.00	342.00	345.00
32	Stone layer	175.00	288.00	295.00	295.00	305.00	307.00
33	Tarman	153.00	252.00	258.00	258.00	267.00	269.00
34	Fireman	155.00	255.00	261.00	261.00	270.00	272.00
35	Grinder	175.00	288.00	295.00	295.00	305.00	307.00
36	Gas cutter	184.00	302.00	309.00	309.00	320.00	323.00
37	Rigger	177.00	291.00	298.00	298.00	308.00	311.00
38	Sarang	209.00	344.00	352.00	352.00	364.00	367.00
39	Chipper-cum-rivetter	184.00	302.00	309.00	309.00	320.00	323.00
40	Tractor operator	209.00	344.00	352.00	352.00	364.00	367.00
41	Dozer operator grade-I	247.00	406.00	415.00	415.00	430.00	434.00
	Dozer operator grade-II	220.00	362.00	370.00	370.00	383.00	386.00
42	Dumper operator	210.00	345.00	353.00	353.00	365.00	368.00
43	Vibrator Operator	163.00	268.00	274.00	274.00	284.00	286.00
44	Pump driver grade-I	185.00	305.00	312.00	312.00	323.00	326.00
	Pump driver grade-II	175.00	288.00	295.00	295.00	305.00	307.00
45	Dragline operator grade-I	247.00	406.00	415.00	415.00	430.00	434.00
	Dragline operator grade-II	220.00	362.00	370.00	370.00	383.00	386.00
46	Concrete mixer operator grade-I	185.00	305.00	312.00	312.00	323.00	326.00
	Concrete mixer operator grade-II	175.00	288.00	295.00	295.00	305.00	307.00
47	Compressor operator grade-I	185.00	305.00	312.00	312.00	323.00	326.00
	Compressor operator grade-II	175.00	288.00	295.00	295.00	305.00	307.00



SCHEDULE - I					Dtd.: 28.11.2018		
Approved Schedule of Rates for labour engaged in construction & maintenance of Roads							
Sl. No.	Category of Employees	Minimum Rates of wages per day as per					
		Lab. Deptt. Noti. No. 2787 /28.09.11	Lab. Deptt. Noti. No. 4971/ 29.11.16	Lab. Deptt. Noti. No. 1194/ 28.03.17	Lab. Deptt. Noti. No. 4835/ 15.09.17	Lab. Deptt. Noti. No. 1453/ 28.03.18	Lab. Deptt. Noti. No. 6770/ 26.09.18
1	2	3	4((1.43xcl3)*1.15)	5(1.02336xcl4)	6	7(1.03498xcl6)	8(1.00816xcl7)
48	Earth excavator						
	(a) For every 110 cu. ft for soft earth	144.00	237.00	243.00	243.00	252.00	254.00
	(b) For every 100 cu. ft for hard earth	144.00	237.00	243.00	243.00	252.00	254.00
	(c) For every 90 cu. ft for highly hard earth	144.00	237.00	243.00	243.00	252.00	254.00
49	Truck driver	209.00	344.00	352.00	352.00	364.00	367.00
50	Car/Jeep driver	184.00	302.00	309.00	309.00	320.00	323.00
51	Crane operator grade-I	247.00	406.00	415.00	415.00	430.00	434.00
	Crane operator grade-II	220.00	362.00	370.00	370.00	383.00	386.00
52	Winch operator	185.00	305.00	312.00	312.00	323.00	326.00
53	Road roller driver	252.00	414.00	424.00	424.00	439.00	443.00
54	Blaster	243.00	399.00	408.00	408.00	422.00	425.00
55	Painter grade-I	185.00	305.00	312.00	312.00	323.00	326.00
56	Polisher	155.00	255.00	261.00	261.00	270.00	272.00
57	Peon / Darvan / Choukidar	153.00	252.00	258.00	258.00	267.00	269.00
58	Clerk / Typist / Typist clerk	173.00	284.00	291.00	291.00	301.00	303.00
59	Time keeper	173.00	284.00	291.00	291.00	301.00	303.00
60	Store Assistant / Storeman	187.00	307.00	314.00	314.00	325.00	328.00
61	Store head	178.00	293.00	300.00	300.00	310.00	313.00
62	Material chaser	178.00	293.00	300.00	300.00	310.00	313.00
63	Mate and Road mate	155.00	255.00	261.00	261.00	270.00	272.00
64	Munshi	163.00	268.00	274.00	274.00	284.00	286.00
65	Work Supervisor	164.00	270.00	276.00	276.00	286.00	288.00
66	Amin	173.00	284.00	291.00	291.00	301.00	303.00
67	Surveyer	177.00	291.00	298.00	298.00	308.00	311.00
68	Supervisory diploma holder	237.00	390.00	399.00	399.00	413.00	416.00
69	Supervisory non-diploma holder	175.00	288.00	295.00	295.00	305.00	307.00
70	Any other category of semi-skilled workers not mentioned above	150.00	247.00	252.00	257.00	265.00	268.00
71	Any other category of skilled workers not mentioned above	183.00	301.00	307.00	313.00	322.00	325.00
72	Highly skilled labour	223.00	367.00	374.00	381.00	392.00	396.00

Note :- The above rates has been calculated as 0.816% increase vide Labour Dept. Notification No. 6770 Dtd. 26.09.2018 i.e (1.00816 \* column 7).

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख, लघु जल संसाधन  
विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह  
-मुख्य अभियंता (असैनिक), बिहार स्टेट पावर  
होल्टिंग कंपनी लि०ए बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग,  
बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-  
अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

संयोजक,  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख-सह-अपर  
आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।



# SCHEDULE - II

Dtd.:- 28.11.2018

## Approved Schedule of Rates for labour engaged in Dam construction & Irrigation works

Sl. No.	Category of Employees	Minimum Rates of wages per day as per					
		Lab. Dep'tt. Noti. No. 2787 / 28.09.11	Lab. Dep'tt. Noti. No. 4971/ 29.11.16	Lab. Dep'tt. Noti. No. 1194/ 28.03.17	Lab. Dep'tt. Noti. No. 4835/ 15.09.17	Lab. Dep'tt. Noti. No. 1453/ 28.03.18	Lab. Dep'tt. Noti. No. 6770/ 26.09.18
1	2	3	4((1.43xcl3)*1.15)	5(1.02336xcl4)	6	7(1.03498xcl6)	8(1.00816xcl7)
1	Unskilled labour	144.00	237.00	242.00	247.00	254.00	257.00
2	Mate	158.00	260.00	266.00	266.00	275.00	277.00
3	Head Mason	196.00	322.00	330.00	330.00	342.00	345.00
4	Mason	175.00	288.00	295.00	295.00	305.00	307.00
5	Printer Class-I	185.00	305.00	312.00	312.00	323.00	326.00
6	Printer Class-II	175.00	288.00	295.00	295.00	305.00	307.00
7	Head Carpenter	196.00	322.00	330.00	330.00	342.00	345.00
8	Carpenter	175.00	288.00	295.00	295.00	305.00	307.00
9	Head black smith	196.00	322.00	330.00	330.00	342.00	345.00
10	Black Smith	175.00	288.00	295.00	295.00	305.00	307.00
11	Glazier	155.00	255.00	261.00	261.00	270.00	272.00
12	Stone Dresser	185.00	305.00	312.00	312.00	323.00	326.00
13	Water Carrier	144.00	237.00	243.00	243.00	252.00	254.00
14	Fitter Class-I	199.00	328.00	336.00	336.00	348.00	351.00
15	Fitter Class-II	175.00	288.00	295.00	295.00	305.00	307.00
16	Helper	153.00	252.00	258.00	258.00	267.00	269.00
17	Hammer man	153.00	252.00	258.00	258.00	267.00	269.00
18	Bellowman	144.00	237.00	243.00	243.00	252.00	254.00
19	Road Roller Driver	252.00	414.00	424.00	424.00	439.00	443.00
20	Concrete Mixer Operator, Class-I	185.00	305.00	312.00	312.00	323.00	326.00
21	Concrete Mixer Operator, Class-II	175.00	288.00	295.00	295.00	305.00	307.00
22	Stone Crusher Driver, Class-I	185.00	305.00	312.00	312.00	323.00	326.00
23	Stone Crusher Driver, Class-II	175.00	288.00	295.00	295.00	305.00	307.00
24	Truck Driver	209.00	344.00	352.00	352.00	364.00	367.00
25	Compressor Operator, Class-I	185.00	305.00	312.00	312.00	323.00	326.00
26	Compressor Operator, Class-II	175.00	288.00	295.00	295.00	305.00	307.00
27	Pump Driver, Class-I	185.00	305.00	312.00	312.00	323.00	326.00
28	Pump Driver, Class-II	175.00	288.00	295.00	295.00	305.00	307.00
29	Concrete Mixer Attendant	153.00	252.00	258.00	258.00	267.00	269.00
30	Cleaner or Oilman	148.00	244.00	250.00	250.00	259.00	261.00
31	TarBoiler Man	175.00	288.00	295.00	295.00	305.00	307.00
32	Plumber	185.00	305.00	312.00	312.00	323.00	326.00
33	Thatcher	155.00	255.00	261.00	261.00	270.00	272.00
34	Khalasi / Chainman	155.00	255.00	261.00	261.00	270.00	272.00
35	Sweeper	148.00	244.00	250.00	250.00	259.00	261.00
36	Watchamn	148.00	244.00	250.00	250.00	259.00	261.00
37	Stone Breaker	148.00	244.00	250.00	250.00	259.00	261.00
38	Work Sarker	164.00	270.00	276.00	276.00	286.00	288.00
39	Time Keeper	173.00	284.00	291.00	291.00	301.00	303.00
40	Welder, Grade-I	220.00	362.00	370.00	370.00	383.00	386.00
41	Welder, Grade-II	185.00	305.00	312.00	312.00	323.00	326.00
42	Wireman/Lineman	169.00	278.00	284.00	284.00	294.00	296.00
43	Mechanic, Grade-I	225.00	370.00	379.00	379.00	392.00	395.00
44	Mechanic, Grade-II	209.00	344.00	352.00	352.00	364.00	367.00
45	Sarang	209.00	344.00	352.00	352.00	364.00	367.00
46	Drill Operator	175.00	288.00	295.00	295.00	305.00	307.00
47	Tractor Operator	209.00	344.00	352.00	352.00	364.00	367.00
48	Gauge Reader-cum-silt Observer	153.00	252.00	258.00	258.00	267.00	269.00
49	Crane Operator, Grade-I	247.00	406.00	415.00	415.00	430.00	434.00
50	Crane Operator, Grade-II	220.00	362.00	370.00	370.00	383.00	386.00
51	Dragline / Scraper / Showel Operator Grade-I	247.00	406.00	415.00	415.00	430.00	434.00
52	Dragline/Scraper/Showel Operator Grade-II	220.00	362.00	370.00	370.00	383.00	386.00
53	Dumper Operator	210.00	345.00	353.00	353.00	365.00	368.00
54	Foreman	247.00	406.00	415.00	415.00	430.00	434.00

SCHEDULE - II					Dtd.:- 28.11.2018		
Approved Schedule of Rates for labour engaged in Dam construction & Irrigation works							
Sl. No.	Category of Employees	Minimum Rates of wages per day as per					
		Lab. Deptt. Noti. No. 2787 /28.09.11	Lab. Deptt. Noti. No. 4971/ 29.11.16	Lab. Deptt. Noti. No. 1194/ 28.03.17	Lab. Deptt. Noti. No. 4835/ 15.09.17	Lab. Deptt. Noti. No. 1453/ 28.03.18	Lab. Deptt. Noti. No. 6770/ 26.09.18
1	2	3	4((1.43xcl3)*1.15)	5(1.02336xcl4)	6	7(1.03498xcl6)	8(1.00816xcl7)
55	Junior Forman	220.00	362.00	370.00	370.00	383.00	386.00
56	Chargeman	210.00	345.00	353.00	353.00	365.00	368.00
57	Electrician, Grade-I	185.00	305.00	312.00	312.00	323.00	326.00
58	Electrician, Grade-II	175.00	288.00	295.00	295.00	305.00	307.00
59	Electrician, Grade-III	153.00	252.00	258.00	258.00	267.00	269.00
60	Turner	175.00	288.00	295.00	295.00	305.00	307.00
61	Compounder	175.00	288.00	295.00	295.00	305.00	307.00
62	Supervisor / (Diploma holder)	237.00	390.00	399.00	399.00	413.00	416.00
63	Surveyer / Supervisor	175.00	288.00	295.00	295.00	305.00	307.00
64	Blue Printer	153.00	252.00	258.00	258.00	267.00	269.00
65	Tracer	153.00	252.00	258.00	258.00	267.00	269.00
66	Vibrator Operator	163.00	268.00	274.00	274.00	284.00	286.00
67	Clerk / Typist / Typist Clerk	173.00	284.00	291.00	291.00	301.00	303.00
68	Earth Excavator,						
	(a) For every 110 cubic feet of soft earth	144.00	237.00	243.00	243.00	252.00	254.00
	(b) For every 100 cubic feet of hard earth	144.00	237.00	243.00	243.00	252.00	254.00
	(c) For every 90 cubic feet of highly hard earth	144.00	237.00	243.00	243.00	252.00	254.00
69	Any other category of semi-skilled workers not mentioned above	150.00	247.00	252.00	257.00	265.00	268.00
70	Any other category of skilled workers not mentioned above	183.00	301.00	307.00	313.00	322.00	325.00
71	Highly skilled labour	223.00	367.00	374.00	381.00	392.00	396.00

Note :- The above rates has been calculated as 0.816% increase vide Labour Dept. Notification No. 6770 Dtd. 26.09.2018 i.e (1.00816 \* column 7).

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख, लघु जल संसाधन  
विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह  
-मुख्य अभियंता (असैनिक), बिहार स्टेट पावर  
होल्टिंग कंपनी लि०ए बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग,  
बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-  
अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

संयोजक,  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख-सह-अपर  
आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।

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# **CONSTRUCTION MATERIAL RATE**

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# Schedule : M1

Date: 26.02.19

List of Rates of Ordinary Portland Cement approved by State Level Schedule Rate Committee for the year 2019 - 20(for Preparation of Schedule of Rates only) - Materials should conform to relevant BIS/IRC/MORT&H Specifications.

Rates are exclusive of GST.

Sl. No.	Name & Description of Material	Unit	Zones	Approved Rate	
				in figure (₹)	in words
1	2	3	4	5	6
1	Ordinary Portland Cement (O.P.C. - 43 Grade)	Per bag of 50 Kg	Patna	257.80	Rupees Two Hundred Fifty Seven and Paise Eighty Only
			Muzaffarpur	253.70	Rupees Two Hundred Fifty Three and Paise Seventy Only
			Darbhanga	257.80	Rupees Two Hundred Fifty Seven and Paise Eighty Only
			Bhagalpur	253.80	Rupees Two Hundred Fifty Three and Paise Eighty Only
			Munger	253.80	Rupees Two Hundred Fifty Three and Paise Eighty Only
			Saharsa	257.80	Rupees Two Hundred Fifty Seven and Paise Eighty Only
			Purnea	257.80	Rupees Two Hundred Fifty Seven and Paise Eighty Only
			Gaya	244.10	Rupees Two Hundred Forty Four and Paise Ten Only
			Saran	253.40	Rupees Two Hundred Fifty Three and Paise Forty Only

Note:- The above rate of cement is exclusive of 28% GST.

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
सह-मुख्य अभियंता (असै०), बिहार  
स्टेट पावर होल्डिंग कंपनी लिमिटेड  
बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।

## Schedule : M2

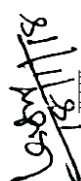
Date: 18.01.18


**List of Rates of Ordinary Portland Cement approved by State Level Schedule Rate Committee for the year 2018- 19 (for Preparation of Schedule of Rates only) - Materials should conform to relevant BIS/IRC/MORT&H Specifications.**


**Rates are exclusive of GST.**


Sl. No.	Name & Description of Material	Unit	Zones	Approved Rate	
				in figure (₹)	in words
1	2	3	4	5	6
1	Ordinary Portland Cement	Per bag of 50 Kg	Patna	210.90	Rupees Two Hundred Ten and Paise Ninety Only
	(O.P.C. - 33 Grade)		Muzaffarpur	213.90	Rupees Two Hundred Thirteen and Paise Ninety Only
			Darbhanga	220.90	Rupees Two Hundred Twenty and Paise Ninety Only
			Bhagalpur	220.90	Rupees Two Hundred Twenty and Paise Ninety Only
			Munger	220.90	Rupees Two Hundred Twenty and Paise Ninety Only
			Saharsa	228.10	Rupees Two Hundred Twenty Eight and Paise Ten Only
			Purnea	228.10	Rupees Two Hundred Twenty Eight and Paise Ten Only
			Graya	199.60	Rupees One Hundred Ninety Nine and Paise Sixty Only
			Saran	213.90	Rupees Two Hundred Thirteen and Paise Ninety Only

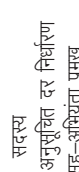
**Note:- The above rate of cement is exclusive of 28% GST.**


  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

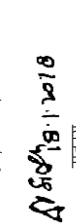
  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।


  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असैनिक),  
बिहार स्टेट पावर होल्डिंग कंपनी लि०  
बिहार, पटना।

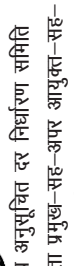
  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निर्माण विभाग, बिहार, पटना।

  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, लोक  
स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

  
संयोजक,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-  
विशेष सचिव, पथ निर्माण विभाग, बिहार, पटना।

# Schedule : M3A

Date: 26.02.19

List of Rates of Portland Pozzolana Cement approved by State Level Schedule Rate Committee for the year 2019- 20 (for Preparation of Schedule of Rates only) - Materials should conform to relevant BIS/IRC/MORT&H Specifications.

Rates are exclusive of GST.

Sl. No.	Name & Description of Material	Unit	Zones	Approved Rate	
				in figure (₹)	in words
1	2	3	4	5	6
1	Portland Pozzolana Cement (P.P.C.)	Per bag of 50 Kg	Patna	218.80	Rupees Two Hundred Eighteen and Paise Eighty Only
			Muzaffarpur	211.20	Rupees Two Hundred Eleven and Paise Twenty Only
			Darbhanga	211.20	Rupees Two Hundred Eleven and Paise Twenty Only
			Bhagalpur	218.80	Rupees Two Hundred Eighteen and Paise Eighty Only
			Munger	216.70	Rupees Two Hundred Sixteen and Paise Seventy Only
			Saharsa	215.00	Rupees Two Hundred Fifteen and Paise Zero Only
			Purnea	222.30	Rupees Two Hundred Twenty Two and Paise Thirty Only
			Gaya	192.30	Rupees One Hundred Ninety Two and Paise Thirty Only
			Saran	213.70	Rupees Two Hundred Thirteen and Paise Seventy Only

Note:- The above rate of cement is exclusive of 28% GST.

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असें), बिहार स्टेट  
पावर होल्डिंग कंपनी लिमिटेड, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
नगरानी विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह  
-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।

# Schedule : M3B

Date: 26.02.19

List of Rates of Portland Slag Cement approved by State Level Schedule Rate Committee for the year 2019 - 20(for Preparation of Schedule of Rates only) - Materials should conform to relevant BIS/IRC/MORT & H Specifications.

Rates are exclusive of GST.

Sl. No.	Name & Description of Material	Unit	Zones	Approved Rate	
				in figure (₹)	in words
1	2	3	4	5	6
1	Portland Slag Cement (P.S.C.)	Per bag of 50 Kg	Patna	242.20	Rupees Two Hundred Forty Two and Paise Twenty Only
			Muzaffarpur	240.90	Rupees Two Hundred Forty and Paise Ninety Only
			Darbhanga	236.00	Rupees Two Hundred Thirty Six and Paise Zero Only
			Bhagalpur	241.60	Rupees Two Hundred Forty One and Paise Sixty Only
			Munger	232.60	Rupees Two Hundred Thirty Two and Paise Sixty Only
			Saharsa	240.10	Rupees Two Hundred Forty and Paise Ten Only
			Purnea	236.00	Rupees Two Hundred Thirty Six and Paise Zero Only
			Gaya	231.80	Rupees Two Hundred Thirty One and Paise Eighty Only
			Saran	238.40	Rupees Two Hundred Thirty Eight and Paise Forty Only

Note:- The above rate of cement is exclusive of 28% GST.

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26.2.19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै०), बिहार स्टेट  
पावर होल्डिंग कंपनी लिमिटेड, बिहार, पटना।

सदस्य  
26.2.19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह  
-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
26.2.19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
नगरानी विभाग, बिहार, पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।



# Schedule : M3C

Date: 26.02.19

List of Rates of Portland Composite Cement approved by State Level Schedule Rate Committee for the year 2019 - 20 (for Preparation of Schedule of Rates only) - Materials should conform to relevant BIS/IRC/MORT & H Specifications.

Rates are exclusive of GST.

Sl. No.	Name & Description of Material	Unit	Zones	Approved Rate	
				in figure (₹)	in words
1	2	3	4	5	6
1	Portland Composite Cement (P.C.C.)	Per bag of 50 Kg	Patna	226.60	Rupees Two Hundred Twenty Six and Paise Sixty Only
			Muzaffarpur	226.60	Rupees Two Hundred Twenty Six and Paise Sixty Only
			Darbhanga	226.60	Rupees Two Hundred Twenty Six and Paise Sixty Only
			Bhagalpur	226.60	Rupees Two Hundred Twenty Six and Paise Sixty Only
			Munger	226.60	Rupees Two Hundred Twenty Six and Paise Sixty Only
			Saharsa	226.60	Rupees Two Hundred Twenty Six and Paise Sixty Only
			Purnea	226.60	Rupees Two Hundred Twenty Six and Paise Sixty Only
			Gaya	226.60	Rupees Two Hundred Twenty Six and Paise Sixty Only
			Saran	226.60	Rupees Two Hundred Twenty Six and Paise Sixty Only

Note:- The above rate of cement is exclusive of 28%GST.

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै०), बिहार स्टेट  
पावर होल्डिंग कंपनी लिमिटेड, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह  
-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
नगरानी विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।

# Schedule : M4

Date: 26.02.19

List of Rates of Different Grades of Bitumen approved by State Level Schedule Rate Committee for the year 2019 - 20 for the preparation of Schedule of Rates only. Materials should confirm to relevant BIS/IRC/MORT&H Specifications.

Rates are exclusive of GST @ 18%.

Sl. No.	Name & Description of Material	Unit	Approved Rate	
			in figure(₹)	in words
1	2	3	4	5
1	Bitumen Grade VG-40(30/40 )Packed			
	(i) Ex. Muzaffarpur	Per MT	34427.50	Rupees Thirty Four Thousand Four Hundred Twenty Seven and Paise Fifty Only
	(ii) Ex. Fatuha	Per MT	34177.50	Rupees Thirty Four Thousand One Hundred Seventy Seven and Paise Fifty Only
	(iii) Ex. Gaya	Per MT	33980.00	Rupees Thirty Three Thousand Nine Hundred Eighty and Paise Zero Only
2	Bitumen Grade VG-30(60/70) Packed			
	(i ) Ex. Barauni	Per MT	32830.00	Rupees Thirty Two Thousand Eight Hundred Thirty and Paise Zero Only
	(ii) Ex. Gaya	Per MT	32710.00	Rupees Thirty Two Thousand Seven Hundred Ten and Paise Zero Only
	(iii) Ex. Fatuha	Per MT	32907.50	Rupees Thirty Two Thousand Nine Hundred Seven and Paise Fifty Only
	(iv) Ex. Jasidih	Per MT	32407.50	Rupees Thirty Two Thousand Four Hundred Seven and Paise Fifty Only
	(v) Ex. Muzaffarpur	Per MT	33157.50	Rupees Thirty Three Thousand One Hundred Fifty Seven and Paise Fifty Only
3	Bitumen Grade VG-10( 80/100) Packed			
	(i ) Ex. Barauni	Per MT	32030.00	Rupees Thirty Two Thousand Thirty and Paise Zero Only
	(ii) Ex. Gaya	Per MT	31910.00	Rupees Thirty One Thousand Nine Hundred Ten and Paise Zero Only
	(iii) Ex. Fatuha	Per MT	32107.50	Rupees Thirty Two Thousand One Hundred Seven and Paise Fifty Only
	(iv) Ex. Jasidih	Per MT	31607.50	Rupees Thirty One Thousand Six Hundred Seven and Paise Fifty Only
	(v) Ex. Muzaffarpur	Per MT	32357.50	Rupees Thirty Two Thousand Three Hundred Fifty Seven and Paise Fifty Only
4	Bitumen Grade VG-40( 30/40) Bulk			
	(i) Ex. Barauni	Per MT	28820.00	Rupees Twenty Eight Thousand Eight Hundred Twenty and Paise Zero Only
5	Bitumen Grade VG-30( 60/70) Bulk			
	(i) Ex. Barauni	Per MT	28350.00	Rupees Twenty Eight Thousand Three Hundred Fifty and Paise Zero Only
6	Bitumen Grade VG-10(80/100) Bulk			
	(i) Ex. Barauni	Per MT	27950.00	Rupees Twenty Seven Thousand Nine Hundred Fifty and Paise Zero Only
7	Modified Graded Bitumen			
	(i) CRMB-55 Packed Ex. Barauni	Per MT	34920.00	Rupees Thirty Four Thousand Nine Hundred Twenty and Paise Zero Only
	(ii) CRMB-55 Packed Ex. Gaya	Per MT	36050.00	Rupees Thirty Six Thousand Fifty and Paise Zero Only
	(iii) CRMB-55 Packed Ex. Fatuha	Per MT	34997.50	Rupees Thirty Four Thousand Nine Hundred Ninety Seven and Paise Fifty Only
	(iv) CRMB-55 Packed Ex. Muzaffarpur	Per MT	36497.50	Rupees Thirty Six Thousand Four Hundred Ninety Seven and Paise Fifty Only
8	Bitumen Emulsion RS1(Packed) Drum			
	(i) Ex. Patna	Per MT	37539.00	Rupees Thirty Seven Thousand Five Hundred Thirty Nine and Paise Zero Only
	(ii) Ex. Gaya	Per MT	37739.00	Rupees Thirty Seven Thousand Seven Hundred Thirty Nine and Paise Zero Only
	(iii) Ex. Muzaffarpur	Per MT	37289.00	Rupees Thirty Seven Thousand Two Hundred Eighty Nine and Paise Zero Only
9	Bitumen Emulsion MS(Packed) Drum			
	(i) Ex. Patna	Per MT	39475.00	Rupees Thirty Nine Thousand Four Hundred Seventy Five and Paise Zero Only
	(ii) Ex. Gaya	Per MT	39625.00	Rupees Thirty Nine Thousand Six Hundred Twenty Five and Paise Zero Only
	(iii) Ex. Muzaffarpur	Per MT	39175.00	Rupees Thirty Nine Thousand One Hundred Seventy Five and Paise Zero Only
10	Bitumen Emulsion SS1(Packed) Drum			
	(i) Ex. Patna	Per MT	39613.00	Rupees Thirty Nine Thousand Six Hundred Thirteen and Paise Zero Only
	(ii) Ex. Gaya	Per MT	39813.00	Rupees Thirty Nine Thousand Eight Hundred Thirteen and Paise Zero Only
	(iii) Ex. Muzaffarpur	Per MT	39363.00	Rupees Thirty Nine Thousand Three Hundred Sixty Three and Paise Zero Only

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26-2-19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै०), बिहार  
स्टेट पावर होल्डिंग कंपनी लिमिटेड  
बिहार, पटना।

सदस्य  
26-2-19  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार,  
पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-  
सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।

**Schedule : M5**

Date: 26.02.19

**Approved new rate of G.C. Sheet by State Level Schedule Rate Committee for the year 2019- 20 (for Preparation of Schedule of Rates only) - Materials should conform to relevant BIS/IRC/MORT & H Specifications.**

**Rates are exclusive of GST@ 18%.**

Sl. No.	Name & Description of Material	Unit	Approved Rate	
			in figure (₹)	in words
1	2	3	4	5
	<b>G. C. Sheet in mm</b>			
1	0.63	Per MT	51355.93	Rupees Fifty One Thousand Three Hundred Fifty Five and Paise Ninety Three Only
2	0.50	Per MT	52881.36	Rupees Fifty Two Thousand Eight Hundred Eighty One and Paise Thirty Six Only
3	0.40	Per MT	70405.08	Rupees Seventy Thousand Four Hundred Five and Paise Eight Only
4	0.35	Per MT	73072.88	Rupees Seventy Three Thousand Seventy Two and Paise Eighty Eight Only

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै०), बिहार स्टेट पावर होल्डिंग कंपनी लिमिटेड, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह  
-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
नगरानी विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।

# Schedule : M6

Date: 26.02.19

Approved rate of Steel - Wire Rod in Coil by State Level Schedule Rate Committee for the year 2019- 20 (for Preparation of Schedule of Rates only) - Materials should conform to relevant BIS/IRC/MORT&H Specifications.

Rates are exclusive of GST@ 18%.

Sl. No.	Name & Description of Material	Unit	Approved Rate	
			in figure (₹)	in words
1	2	3	4	5
	Wire Rod in Coil			
1	5.5 mm	Per MT	46050.00	Rupees Forty Six Thousand Fifty and Paise Zero Only
2	6.0 mm	Per MT	45970.00	Rupees Forty Five Thousand Nine Hundred Seventy and Paise Zero Only
3	6.5 mm	Per MT	45830.00	Rupees Forty Five Thousand Eight Hundred Thirty and Paise Zero Only
4	7.0 mm	Per MT	45700.00	Rupees Forty Five Thousand Seven Hundred and Paise Zero Only
5	8.0 mm	Per MT	45570.00	Rupees Forty Five Thousand Five Hundred Seventy and Paise Zero Only
6	10.0 mm	Per MT	46100.00	Rupees Forty Six Thousand One Hundred and Paise Zero Only
7	12.0/12.7 mm	Per MT	46100.00	Rupees Forty Six Thousand One Hundred and Paise Zero Only

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै), बिहार स्टेट पावर होल्डिंग कंपनी लिमिटेड, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै), बिहार स्टेट पावर होल्डिंग कंपनी लिमिटेड, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
नगरानी विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
नगरानी विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
नगरानी विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।

# Schedule : M8

Date: 26.02.19

Approved rate of Steel Channel by State Level Schedule Rate Committee for the year 2019 - 20(for Preparation of Schedule of Rates only) - Materials should conform to relevant BIS/IRC/MORT&H Specifications.  
Rates are exclusive of GST@ 18%.

Sl. No.	Name & Description of Material	Unit	Approved Rate	
			in figure (₹)	in words
1	2	3	4	5
	STEEL CHANNEL			
1	Channel 100 x 50	Per MT	45260.00	Rupees Forty Five Thousand Two Hundred Sixty and Paise Zero Only
2	Channel 125 x 65	Per MT	45260.00	Rupees Forty Five Thousand Two Hundred Sixty and Paise Zero Only
3	Channel 150 x 75	Per MT	45260.00	Rupees Forty Five Thousand Two Hundred Sixty and Paise Zero Only
4	Channel 200 x 75	Per MT	45530.00	Rupees Forty Five Thousand Five Hundred Thirty and Paise Zero Only

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै०), बिहार स्टेट पावर होलिंग कंपनी लिमिटेड, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह  
-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषाग,  
निगरानी विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।

# Schedule : M9

Date: 26.02.19

Approved rate of Steel Angles by State Level Schedule Rate Committee for the year 2019 - 20 (for Preparation of Schedule of Rates only) - Materials should conform to relevant BIS/IRC/MORT&H Specifications.

Rates are exclusive of GST@ 18%.

Sl. No.	Name & Description of Material	Unit	Approved Rate	
			in figure (₹)	in words
1	2	3	4	5
	STEEL ANGLES			
1	75 x 75 x 6	Per MT	43550.00	Rupees Forty Three Thousand Five Hundred Fifty and Paise Zero Only
2	80 x 80 x 8/10/12	Per MT	43550.00	Rupees Forty Three Thousand Five Hundred Fifty and Paise Zero Only
3	90 x 90 x 6/8	Per MT	43550.00	Rupees Forty Three Thousand Five Hundred Fifty and Paise Zero Only
4	100 x 100 x 8/10/12	Per MT	43550.00	Rupees Forty Three Thousand Five Hundred Fifty and Paise Zero Only
5	110 x 110 x 8/10/12	Per MT	43550.00	Rupees Forty Three Thousand Five Hundred Fifty and Paise Zero Only
6	130 x 130 x 10/12	Per MT	43550.00	Rupees Forty Three Thousand Five Hundred Fifty and Paise Zero Only
7	150 x 150 x 12/16/20	Per MT	43550.00	Rupees Forty Three Thousand Five Hundred Fifty and Paise Zero Only
8	200 x 200 x 16/18/20	Per MT	43550.00	Rupees Forty Three Thousand Five Hundred Fifty and Paise Zero Only

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै०), बिहार स्टेट पावर होल्डिंग कंपनी लिमिटेड, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह  
-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
नगरानी विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।

# Schedule : M10A

Date: 26.02.19

Approved rate of Steel - TMT BARS (Fe 500) State Level Schedule Rate Committee for the year 2019- 20 (for Preparation of Schedule of Rates only) - Materials should conform to relevant BIS/IRC/MORT&H Specifications.

Rates are exclusive of GST@ 18%.

Sl. No.	Name & Description of Material	Unit	Approved Rate	
			in figure (₹)	in words
1	2	3	4	5
	STEEL TMT BARS			
1	TMT Fe 500 - 8 mm	Per MT	43644.00	Rupees Forty Three Thousand Six Hundred Forty Four and Paise Zero Only
2	TMT Fe 500 -10 mm	Per MT	42712.00	Rupees Forty Two Thousand Seven Hundred Twelve and Paise Zero Only
3	TMT Fe 500 -12 mm	Per MT	42119.00	Rupees Forty Two Thousand One Hundred Nineteen and Paise Zero Only
4	TMT Fe 500 -16 mm	Per MT	42119.00	Rupees Forty Two Thousand One Hundred Nineteen and Paise Zero Only
5	TMT Fe 500 -20 mm	Per MT	42119.00	Rupees Forty Two Thousand One Hundred Nineteen and Paise Zero Only
6	TMT Fe 500 -25 mm	Per MT	42119.00	Rupees Forty Two Thousand One Hundred Nineteen and Paise Zero Only
7	TMT Fe 500 -28 mm	Per MT	42712.00	Rupees Forty Two Thousand Seven Hundred Twelve and Paise Zero Only
8	TMT Fe 500 -32 mm	Per MT	42712.00	Rupees Forty Two Thousand Seven Hundred Twelve and Paise Zero Only

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै०), बिहार स्टेट पावर होल्डिंग कंपनी लिमिटेड, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह  
-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
नगरानी विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।



## Schedule: M11

Date: 26.02.19

Approved Rate of Bricks & Bricks related materials by the State Level Schedule Rate Committee for the year 2019 - 20

(for preparation of Schedule of Rates only) - Materials should conform to relevant BIS/IRC/MoRT&H Specifications.

Rates are inclusive of Royalty but Exclusive of all taxes, Contractor's profit and Overhead charges (Rates at source).

Sr. No.	Materials	Unit	Approved Rate	
			in figure (₹)	in words
<b>1</b>	<b>100 A Bricks</b>			
	(i) For urban Patna	Nos/1000	6214.00	Rupees Six Thousand Two Hundred Fourteen and Paise Zero Only
	(ii) For Darbhanga, Bhagalpur, Munger & Muzaffarpur	Nos/1000	5243.00	Rupees Five Thousand Two Hundred Forty Three and Paise Zero Only
	(iii) For Gaya & Saran	Nos/1000	4960.00	Rupees Four Thousand Nine Hundred Sixty and Paise Zero Only
	(iv) For Saharsa	Nos/1000	5386.00	Rupees Five Thousand Three Hundred Eighty Six and Paise Zero Only
	(v) For Purnea	Nos/1000	5671.00	Rupees Five Thousand Six Hundred Seventy One and Paise Zero Only
	(vi) For rural Patna	Nos/1000	5173.00	Rupees Five Thousand One Hundred Seventy Three and Paise Zero Only
<b>2</b>	<b>100 B Bricks</b>			
	(i) For urban Patna	Nos/1000	5767.00	Rupees Five Thousand Seven Hundred Sixty Seven and Paise Zero Only
	(ii) For Darbhanga, Bhagalpur, Munger & Muzaffarpur	Nos/1000	4816.00	Rupees Four Thousand Eight Hundred Sixteen and Paise Zero Only
	(iii) For Gaya & Saran	Nos/1000	4533.00	Rupees Four Thousand Five Hundred Thirty Three and Paise Zero Only
	(iv) For Saharsa	Nos/1000	4960.00	Rupees Four Thousand Nine Hundred Sixty and Paise Zero Only
	(v) For Purnea	Nos/1000	5243.00	Rupees Five Thousand Two Hundred Forty Three and Paise Zero Only
	(vi) For rural Patna	Nos/1000	4728.00	Rupees Four Thousand Seven Hundred Twenty Eight and Paise Zero Only
<b>3</b>	<b>Brick Tiles (300mmx150mmx50mm)</b>			
	(i) For urban Patna and rural Patna	Nos/1000	6214.00	Rupees Six Thousand Two Hundred Fourteen and Paise Zero Only
	(ii) For Saharsa, Bhagalpur, Darbhanga & Muzaffarpur	Nos/1000	6240.00	Rupees Six Thousand Two Hundred Forty and Paise Zero Only
	(iii) For Purnea	Nos/1000	6526.00	Rupees Six Thousand Five Hundred Twenty Six and Paise Zero Only
	(iv) For other places	Nos/1000	5955.00	Rupees Five Thousand Nine Hundred Fifty Five and Paise Zero Only
<b>4</b>	<b>Picket Jhama Bricks</b>			
	(i) For urban Patna	Nos/1000	5324.00	Rupees Five Thousand Three Hundred Twenty Four and Paise Zero Only
	(ii) For Darbhanga, Bhagalpur, Munger & Muzaffarpur	Nos/1000	4391.00	Rupees Four Thousand Three Hundred Ninety One and Paise Zero Only
	(iii) For Gaya & Saran	Nos/1000	4102.00	Rupees Four Thousand One Hundred Two and Paise Zero Only
	(iv) For Purnea	Nos/1000	4816.00	Rupees Four Thousand Eight Hundred Sixteen and Paise Zero Only
	(v) For Saharsa	Nos/1000	4533.00	Rupees Four Thousand Five Hundred Thirty Three and Paise Zero Only
	(vi) For rural Patna	Nos/1000	4292.00	Rupees Four Thousand Two Hundred Ninety Two and Paise Zero Only
<b>5</b>	<b>Brick Bats</b>			
	(i) For urban Patna	Per m <sup>3</sup>	1096.00	Rupees One Thousand Ninety Six and Paise Zero Only
	(ii) For Purnea, Saharsa, Bhagalpur, Munger & Darbhanga	Per m <sup>3</sup>	1051.00	Rupees One Thousand Fifty One and Paise Zero Only
	(iii) For other places	Per m <sup>3</sup>	1006.00	Rupees One Thousand Six and Paise Zero Only
	(iv) For rural Patna	Per m <sup>3</sup>	1050.00	Rupees One Thousand Fifty and Paise Zero Only
<b>6</b>	<b>Jhama Metals</b>			
	<b>(a) 63 mm to 40 mm size</b>			
	(i) For urban Patna	Per m <sup>3</sup>	1302.00	Rupees One Thousand Three Hundred Two and Paise Zero Only
	(ii) For Purnea, Saharsa, Bhagalpur, Munger & Darbhanga	Per m <sup>3</sup>	1246.00	Rupees One Thousand Two Hundred Forty Six and Paise Zero Only
	(iii) For other places	Per m <sup>3</sup>	1221.00	Rupees One Thousand Two Hundred Twenty One and Paise Zero Only
	(iv) For rural Patna	Per m <sup>3</sup>	1272.00	Rupees One Thousand Two Hundred Seventy Two and Paise Zero Only
	<b>(b) 40 mm to 20 mm size</b>			
	(i) For urban Patna	Per m <sup>3</sup>	1449.00	Rupees One Thousand Four Hundred Forty Nine and Paise Zero Only
	(ii) For Purnea, Saharsa, Bhagalpur, Munger & Darbhanga	Per m <sup>3</sup>	1390.00	Rupees One Thousand Three Hundred Ninety and Paise Zero Only
	(iii) For other places	Per m <sup>3</sup>	1349.00	Rupees One Thousand Three Hundred Forty Nine and Paise Zero Only
	(iv) For rural Patna	Per m <sup>3</sup>	1406.00	Rupees One Thousand Four Hundred Six and Paise Zero Only



Sr. No.	Materials	Unit	Approved Rate	
			in figure (₹)	in words
	<b>(c) 20 mm and down</b>			
	(i) For urban Patna	Per m <sup>3</sup>	1660.00	Rupees One Thousand Six Hundred Sixty and Paise Zero Only
	(ii) For Purnea, Saharsa, Bhagalpur, Munger & Darbhanga	Per m <sup>3</sup>	1591.00	Rupees One Thousand Five Hundred Ninety One and Paise Zero Only
	(iii) For other places	Per m <sup>3</sup>	1534.00	Rupees One Thousand Five Hundred Thirty Four and Paise Zero Only
	(iv) For rural Patna	Per m <sup>3</sup>	1602.00	Rupees One Thousand Six Hundred Two and Paise Zero Only
<b>7</b>	<b>Surkhi</b>			
	(i) For urban Patna	Per m <sup>3</sup>	1718.00	Rupees One Thousand Seven Hundred Eighteen and Paise Zero Only
	(ii) For Purnea, Saharsa, Bhagalpur, Munger & Darbhanga	Per m <sup>3</sup>	1648.00	Rupees One Thousand Six Hundred Forty Eight and Paise Zero Only
	(iii) For other places	Per m <sup>3</sup>	1591.00	Rupees One Thousand Five Hundred Ninety One and Paise Zero Only
	(iv) For rural Patna	Per m <sup>3</sup>	1660.00	Rupees One Thousand Six Hundred Sixty and Paise Zero Only

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असै०), बिहार स्टेट पावर होल्डिंग कंपनी लिमिटेड बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
26/02/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (विद्युत), भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/02/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय, जल संसाधन विभाग, बिहार, पटना।

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग, निगरानी विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव, पथ निर्माण विभाग, बिहार, पटना।

## Approved Rate for Coarse Sand (Yellow Sand for 2019-20)

खान एवं भूतत्व विभाग, बिहार सरकार, पटना के ज्ञापांक-प्र0-1 (विविध) बैठक-15/17-285/एम0, पटना दिनांक-15.01.2018 एवं ज्ञापांक-7020/एम0, पटना दिनांक-14.11.2017 के अनुसार

Rate of Coarse sand (Yellow sand) at Source (with Royalty, उत्खनन खर्च, Handling Charge, Loading Charge, Mineral development Fund & all taxes including GST)

$$= ₹900/-Per 100 cft+5\% BSMC Commission$$

$$= ₹945/- Per 100 cft i.e ₹333.69/CUM$$

$$\text{Rate excluding GST}@5\%=333.69/1.05=₹317.80$$

Now Rate of Coarse sand at source including Royalty but excluding Loading-Unloading Charge

$$= ₹317.80-167.00=₹150.80/CUM$$

समिति के सदस्यों द्वारा पूर्ण विचारोपरान्त Schedule-M/MORTH-1 के मद संख्या M-004 एवं M-005 पर अंकित Coarse sand का दर ₹150.80/cum अनुमोदित करने का निर्णय लिया गया।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असै०), बिहार स्टेट पावर होल्डिंग कंपनी लिमिटेड बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (विद्युत), भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय, जल संसाधन विभाग, बिहार, पटना।

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग, निगरानी विभाग, बिहार, पटना।

संयोजक  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव, पथ निर्माण विभाग, बिहार, पटना।

# Schedule - M / MORTH - 1

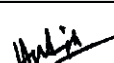
Date: 26.02.19

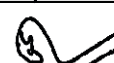
List of Approved Rates of Stone Materials for the Preparation of Schedule of Rates only by the State Level Schedule Rate Committee (Materials Should conform to relevant BIS, MoRD and MoRT&H Specifications). The rates are inclusive of Royalty but exclusive of all taxes, G.S.T. and Contractor's profit.

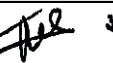
Sl. No.	Description of materials	Unit	Approved Rate (₹)	Remarks
M-001	Stone Boulder of size 150 mm and below at Crusher Plant	cum	303.85	Including Royalty @ ₹ 100.0 per Cum
M-002	Supply of quarried stone 150 - 200 mm size for Hand Broken at site	cum	303.85	Including Royalty @ ₹ 100.0 per Cum
M-003	Boulder with minimum size of 300 mm for Pitching at Site	cum	303.85	Including Royalty @ ₹ 100.0 per Cum
M-004	Coarse sand i) at source Quarry Koilwar/Sone sand	cum	150.80	Including Royalty @ ₹ 50.0 per Cum
M-005	Coarse sand ii) Equivalent to Koilwar/ Sone sand	cum	150.80	Including Royalty @ ₹ 50.0 per Cum
M-006	Fine sand at Site	cum	116.85	Including Royalty @ ₹ 50.0 per Cum
M-007	Moorum at Site	cum	131.28	Including Royalty @ ₹ 55.0 per Cum
M-008	Gravel/Quarry spall at Site	Cum	303.85	Including Royalty @ ₹ 100.0 per Cum
M-009	Granular Material or hard murrum for GSB works at Site	Cum	131.53	Including Royalty @ ₹ 50.0 per Cum
M-010	Granular Material or hard murrum for GSB works at Mixing Plant	Cum	131.53	Including Royalty @ ₹ 50.0 per Cum
M-011	Fly ash conforming to IS: 3812 (Part II & I) at HMP Plant / Batching Plant / Crushing Plant	Cum	0.00	Nil
M-012	Filter media/Filter Material as per Table 300-3 (MORT&H Specification)	Cum	408.83	Including Royalty @ ₹ 50.0 per Cum
M-013	Close graded Granular sub-base Material 53 mm to 9.5 mm	cum	516.42	Including Royalty @ ₹ 50.0 per Cum
M-014	Close graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	492.71	Including Royalty @ ₹ 50.0 per Cum
M-015	Close graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	553.32	Including Royalty @ ₹ 50.0 per Cum
M-016	Close graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	531.40	Including Royalty @ ₹ 50.0 per Cum
M-017	Close graded Granular sub-base Material 9.5 mm to 2.36 mm	cum	411.33	Including Royalty @ ₹ 50.0 per Cum
M-018	Close graded Granular sub-base Material 4.75mm to 2.36 mm	cum	202.91	Including Royalty @ ₹ 50.0 per Cum
M-019	Close graded Granular sub-base Material 4.75mm to 75 micron mm	cum	188.40	Including Royalty @ ₹ 50.0 per Cum
M-020	Close graded Granular sub-base Material 2.36 mm	cum	188.40	Including Royalty @ ₹ 50.0 per Cum
M-021	Stone crusher dust finer than 3mm with not more than 10% passing 0.075 sieve.	cum	97.14	Including Royalty @ 10.0 % of price
M-022	Coarse graded Granular sub-base Material 2.36 mm & below	cum	185.94	Including Royalty @ ₹ 100.0 per Cum
M-023	Coarse graded Granular sub-base Material 4.75mm to 75 micron mm		185.94	Including Royalty @ ₹ 100.0 per Cum
M-024	Coarse graded Granular sub-base Material 4.75 mm to 2.36 mm	cum	200.45	Including Royalty @ ₹ 100.0 per Cum
M-025	Coarse graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	528.94	Including Royalty @ ₹ 100.0 per Cum
M-026	Coarse graded Granular sub-base Material 26.5 mm to 4.75 mm	cum	499.76	Including Royalty @ ₹ 100.0 per Cum
M-027	Coarse graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	550.85	Including Royalty @ ₹ 100.0 per Cum
M-028	Coarse graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	490.24	Including Royalty @ ₹ 100.0 per Cum
M-029	Coarse graded Granular sub-base Material 53 mm to 26.5mm	cum	458.22	Including Royalty @ ₹ 100.0 per Cum
M-030	Aggregates below 5.6 mm	cum	200.45	Including Royalty @ ₹ 100.0 per Cum
M-031	Aggregates 22.4 mm to 2.36 mm	cum	528.14	Including Royalty @ ₹ 100.0 per Cum
M-032	Aggregates 22.4 mm to 5.6 mm	cum	528.14	Including Royalty @ ₹ 100.0 per Cum
M-033	Aggregates 45 mm to 2.8 mm	cum	470.93	Including Royalty @ ₹ 100.0 per Cum
M-034	Aggregates 45 mm to 22.4 mm	cum	479.11	Including Royalty @ ₹ 100.0 per Cum
M-035	Aggregates 53 mm to 2.8 mm	cum	470.93	Including Royalty @ ₹ 100.0 per Cum

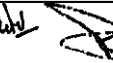


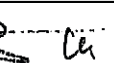
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RCD/SOR\_14<sup>th</sup> Edition\_April 2019

Sl. No.	Description of materials	Unit	Approved Rate (₹)	Remarks
M-036	Aggregates 53 mm to 22.4 mm	cum	458.22	Including Royalty @ ₹ 100.0 per Cum
M-037	Aggregates 63 mm to 2.8 mm	cum	427.80	Including Royalty @ ₹ 100.0 per Cum
M-038	Aggregates 63 mm to 45 mm	cum	427.69	Including Royalty @ ₹ 100.0 per Cum
M-039	Aggregates 90 mm to 45 mm	cum	396.24	Including Royalty @ ₹ 100.0 per Cum
M-040	Aggregates 10 mm to 5 mm	cum	528.94	Including Royalty @ ₹ 100.0 per Cum
M-041	Aggregates 11.2 mm to 0.09 mm	cum	345.52	Including Royalty @ ₹ 100.0 per Cum
M-042	Aggregates 13.2 mm to 0.09 mm	cum	470.04	Including Royalty @ ₹ 100.0 per Cum
M-043	Aggregates 13.2 mm to 5.6 mm	cum	614.17	Including Royalty @ ₹ 100.0 per Cum
M-044	Aggregates 13.2 mm to 10 mm	cum	642.67	Including Royalty @ ₹ 100.0 per Cum
M-045	Aggregates 20 mm to 10 mm	cum	642.67	Including Royalty @ ₹ 100.0 per Cum
M-046	Aggregates 25 mm to 10 mm	cum	612.59	Including Royalty @ ₹ 100.0 per Cum
M-047	Aggregates 19 mm to 6 mm	cum	528.14	Including Royalty @ ₹ 100.0 per Cum
M-048	Aggregates 37.5 mm to 19 mm	cum	479.11	Including Royalty @ ₹ 100.0 per Cum
M-049	Aggregates 37.5 mm to 25 mm	cum	479.11	Including Royalty @ ₹ 100.0 per Cum
M-050	Aggregates 6 mm nominal size	cum	408.74	Including Royalty @ ₹ 100.0 per Cum
M-051	Aggregates 10 mm nominal size	cum	614.17	Including Royalty @ ₹ 100.0 per Cum
M-052	Aggregates 13.2/12.5 mm nominal size	cum	642.67	Including Royalty @ ₹ 100.0 per Cum
M-053	Aggregates 20 mm nominal size	cum	550.85	Including Royalty @ ₹ 100.0 per Cum
M-054	Aggregates 25 mm nominal size	cum	525.31	Including Royalty @ ₹ 100.0 per Cum
M-055	Aggregates 40 mm nominal size	cum	441.08	Including Royalty @ ₹ 100.0 per Cum

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै०), बिहार  
स्टेट पावर होल्डिंग कंपनी लिमिटेड  
बिहार, पटना।

सदस्य  
26/02/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

सदस्य  
26.2.19

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार,  
पटना।

सदस्य  
26/02/19

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

संयोजक,  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष  
सचिव,  
पथ निर्माण विभाग, बिहार, पटना।

**List of Approved Rates of Construction Materials for the Preparation of Schedule of Rates only by the State Level Schedule Rate Committee (Materials Should conform to relevant B.I.S., MoRD and MoRT&H Specifications). The rates are inclusive of Royalty but exclusive of all taxes, G.S.T. and Contractor's profit.**




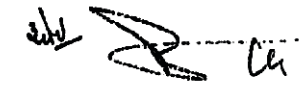
Sl. No.	Description	Unit	Approved Rate (Rs.)
M-056	AC pipe 100 mm dia	metre	40.75
M-057	Acrylic polymer bonding coat	litre	input
M-058	Alluminium Paint	litre	110.75
M-059	Aluminium alloy plate 2mm Thick	sqm	8615.21
M-060	Aluminium alloy/galvanised steel	tonne	34460.81
M-061	Aluminium sheeting fixed with encapsulated lens type reflective sheeting including 2% towards lettering, cost of angle iron, cost of drilling holes, nuts, bolts etc.and signs as applicable	sqm	8035.86
M-062	Road Stud with Micro Prismatic lens reflectors (with shank)	each	165.38
M-063	Barbed wire	kg	61.21
M-064	Bearing (Cost of parts)	nos	input
M-065	Bearing (Cast steel rocker bearing assembly of 250 tonne )	nos	77610.30
M-066	Bearing (Elastomeric bearing assembly consisting of 7 internal layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation)	cubic cm	0.59
M-067	Bearing (Forged steel roller bearing of 250 tonne)	nos	45625.63
M-068	Bearing (Pot type bearing assembly consisting of a metal piston supported by a disc, PTFE pads providing sliding surfaces against stainless steel mating together with cast steel assemblies/ fabricated structural steel assemblies duly painted with all components	MT	137.10
	(a) Fixed POT-PTFE Bearing	MT	137.10
	(b) Free POT-PTFE Bearing	MT	146.90
	(c) Guide Slide (L) POT-PTFE Bearing	MT	156.70
	(d) Guide Slide (T) POT-PTFE Bearing	MT	151.80
M-069	Bearing (PTFE sliding plate bearing assembly of 80 tonnes )	nos	input
M-070	Bearing (Supply of sliding plate bearing of 80 tonne)	nos	30724.33
M-071	Bentonite	kg	3.55
M-072	Binding wire	kg	62.27
M-073	Bitumen ( Cationic Emulsion ) Ex- Patna (R.S1) Packed	tonne	37539.00
M-074	Bitumen (60-70 grade) Packed Ex- Barauni	tonne	32830.00
M-075	Bitumen (80-100 grade ) Packed Ex- Barauni	tonne	32030.00
M-076	Bitumen (Cutback ) Packed Ex- Barauni	tonne	32830.00
M-077	Bitumen (emulsion) Packed Ex- Patna (M.S)	tonne	39475.00
M-078	Bitumen (modified graded) Packed Ex - Barauni (CRMB - 55)	tonne	34920.00
M-079	Brick 100A for - Patna Urban	each	6.214
M-080	C.I. shoes for the pile	kg	43.17
M-081	Cement - OPC 43 Grade at Patna	tonne	5156.00
M-082	Cold twisted bars (HYSD Bars) - Fe 500 Av. of M-10A	tonne	42532.00
M-083	Collar for joints 300 mm dia	nos	input
M-084	Compressible Fibre Board (20mm thick)	sqm	988.42
M-085	Connectors / Staples	each	input
M-086	Copper Plate (12m long x 250mm wide)	kg	746.00
M-087	Corrosion resistant Structural steel	tonne	42131.76

Sl. No.	Description	Unit	Approved Rate (Rs.)
M-088	Corrugated sheet, 3 mm thick, "Thrie" beam section railing	kg	45.04
M-089	Credit for excavated rock found suitable for use (add Royalty @ 25% of Rate)	cum	222.81
M-090	Curing compound	litre	120.27
M-091	Delineators from ISI certified firm as per the standard drawing given in IRC - 79	each	776.17
M-092	Earth Cost or compensation for earth taken from private land	cum	23.78
M-093	Elastomeric slab seal expansion joint assembly manufactured by using chloroprene, elastomer for elastomeric slab unit conforming to clause 915.1 of IRC: 83 (part II)	metre	25876.07
M-094	Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	100 nos	572.86
M-095	Epoxy compound with accessories for preparing epoxy mortar	kg	550.68
M-096	Epoxy mortar	kg	721.64
M-097	Epoxy primer	kg	12.59
M-098	Epoxy resin-hardner mix for prime coat	kg	668.67
M-099	Flag of red color cloth 600 x 600 mm	each	50.74
M-100	Flowering Plants	each	33.83
M-101	Galvanised MS flat clamp	nos	14.70
M-102	Galvanised steel wire crates of mesh size 100 mm x 100 mm woven with 4mm dia. GI wire in rolls of required size.	sqm	95.72
M-103	Galvanised structural steel plate 200 mm wide, 6 mm thick, 24 m long	kg	42.10
M-104	Gelatin 80%	kg	781.83
M-105	Geo grids	sqm	input
M-106	Geomembrane	sqm	input
M-107	Geonets	sqm	101.66
M-108	Geotextile	sqm	79.47
M-109	Geotextile filter fabric	sqm	79.47
M-110	GI bolt 10 mm Dia	nos	15.82
M-111	Grouting pump with agitator	hour	140.04
M-112	Grass (Doob)	kg	4.38
M-113	Grass (Fine)	kg	4.38
M-114	HDPE pipes 75mm dia	metre	191.60
M-115	HDPE pipes 90mm dia	metre	191.60
M-116	Hedge plants	each	33.83
M-117	Helical pipes 600mm diameter	metre	input
M-118	Hot applied Thermoplastic compound (Sp. Gravity - 2.10)	litre	192.38
M-119	HTS strand	tonne	69872.80
M-120	Joint Sealant Compound	kg	24.05
M-121	Jute netting, open weave, 2.5 cm square opening for seeding and Mulching	sqm	33.66
M-122	LDO for steam curing	litre	input
M-123	M.S. Clamps	nos	35.97
M-124	M.S. Clamps	kg	65.11
M-125	M.S.shoes @ 35 Kg per pile of 15 m	kg	24.90
M-126	Mild Steel bars (Av-M6)	tonne	45903.00
M-127	Modular strip/box seal expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm assembly comprising of edge beams, central beam, 2 modules chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative	metre	28516.45

Sl. No.	Description	Unit	Approved Rate (Rs.)
M-128	Modular strip/box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm box/box seal joint assembly containing 3 modules/cells and comprising of edge beams, two central beams, chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative	metre	input
M-129	Nipples 12mm	nos	input
M-130	Nuts and bolts	kg	61.19
M-131	Paint	litre	219.05
M-132	Pavement Marking Paint	litre	219.05
M-133	Paving Fabric	sqm	input
M-134	Perforated geosynthetic pipe 150 mm dia	metre	25.91
M-135	Perforated pipe of cement concrete, internal dia 100 mm	metre	106.55
M-136	Pesticide	kg	75.60
M-137	Pipes 200 mm dia, 2.5 m long for drainage	metre	168.15
M-138	Plastic sheath, 1.25 mm thick for dowel bars	sqm	14.35
M-139	Plastic tubes 50 cm dia, 1.2 m high	nos	input
M-140	Polymer braids	metre	input
M-141	Pre moulded Joint filler, 25 mm thick for expansion joint.	sqm	939.64
M-142	Pre-coated stone chips of 13.2 mm nominal size	cum	590.02
M-143	Preformed continuous chloroprene elastomer or closed cell foam sealing element with high tear strength, vulcanised in a single operation for the full length of a joint to ensure water tightness.	metre	input
M-144	Pre-moulded asphalt filler board	sqm	939.64
M-145	Pre-packed cement based polymer concrete of strength 45 Mpa at 28 days	kg	input
M-146	Primer	kg	12.07
M-147	Quick setting compound	kg	input
M-148	Random Rubble Stone	cum	288.85
M-149	RCC Pipe NP 4 heavy duty non presure pipe 1000 mm dia	metre	2744.50
M-150	RCC Pipe NP 4 heavy duty non presure pipe 1200 mm dia	metre	3901.83
M-151	RCC Pipe NP 4 heavy duty non presure pipe 300 mm dia	metre	502.61
M-152	Reflectorising glass beads	kg	63.57
M-153	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Copper Strips)	metre	input
M-154	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Galvanised carbon steel strips)	metre	input
M-155	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Glass reinforced polymer/fibre reinforced polymer/polymeric strips)	metre	input
M-156	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Stainless steel strips)	metre	input
M-157	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Aluminium strips)	metre	input
M-158	Rivets	each	8.04
M-159	Sand bags (Cost of sand and Empty cement bag)	nos	7.46
M-160	Sapling 2 m high 25 mm dia	each	22.56
M-161	Scrap tyres of size 900 x 20	nos	75.17
M-162	Seeds	kg	33.83
M-163	Selected earth (Excluding royalty @ ₹22.0 per cum & compensation @ ₹1.65 per cum)	cum	23.78
M-164	Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	14.78
M-165	Sheathing duct	metre	82.70




Sl. No.	Description	Unit	Approved Rate (Rs.)
M-166	Shrubs	each	16.91
M-167	Sludge / Farm yard manure @ 0.18 cum per 100 sqm at site of work for turfing	cum	761.11
M-168	Sodium vapour lamp	each	input
M-169	Square Rubble Coursed Stone	cum	288.84
M-170	Steel circular hollow pole of standard specification for street lighting to mount light at 5 m height above deck level	each	input
M-171	Steel circular hollow pole of standard specification for street lighting to mount light at 9 m height above road level	each	input
M-172	Steel drum 300 mm dia 1.2 m high/empty bitumen drum	nos	125.91
M-173	Steel helmet and cushion block on top of pile head during driving.	kg	38.06
M-174	Steel pipe 25 mm external dia as per IS:1239	metre	123.51
M-175	Steel pipe 50 mm external dia as per IS:1239	metre	221.02
M-176	Steel wire rope 20 mm	kg	42.15
M-177	Steel wire rope 40 mm	kg	42.15
M-178	Strip seal expansion join	metre	8027.80
M-179	Structural Steel (Av. of M6, M8 & M9)	tonne	44927.00
M-180	Super plastisizer admixture IS marked as per 9103-1999	kg	166.14
M-181	Synthetic Geogrids as per clause 3102.8 and approved design and specifications.	sqm	input
M-182	Through and bond stone	each	10.48
M-183	Tie rods 20mm diameter	nos	input
M-184	Tiles size 300 x 300 mm and 25 mm thick	each	39.73
M-185	Timber	cum	42224.54
M-186	Traffic cones with 150 mm reflective sleeve	nos	input
M-187	Tube anchorage set complete with bearing plate, permanent wedges etc	nos	45.10
M-188	Unslaked lime	tonne	3555.38
M-189	Water	KL	253.69
M-190	Water based cement paint	litre	111.48
M-191	Welded steel wire fabric	kg	44.36
M-192	Wire mesh 50mm x 50mm size of 3mm wire	kg	42.86
M-193	Wooden ballies 2" Dia for bracing (Sal)	each	20.98
M-194	Wooden ballies 8" Dia and 9 m long (9 m @ ₹67.41/m) - Sal	each	507.48
M-195	Wooden packing	cum	input
M-196	Wooden staff for fastening of flag 25 mm dia, 1.0 m long	each	26.23
M-197	Bitumen (30/40 grade) Ex-Patna Packed	tonne	34177.50
M-198	Fly Ash Brick conforming to IS: 3812 ( Part I & II ) (Excluding the carriage cost* of Fly Ash from point of production to Kiln site without OH & CP) (*Carriage cost of fly ash is same as of sand)(Cost of 1000nos. is ₹5008)	each	5.008
M-199	Paver Block (Excluding VAT )		0.00
	(i) M -35 Grade and 60 mm thickness (a) White	sqm	463.54
	(b) Red	sqm	471.80
	(c) Yellow	sqm	486.61

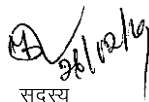







Sl. No.	Description		Unit	Approved Rate (Rs.)
	(ii) M-40 Grade and 80mm thickness	(a) White	sqm	531.94
		(b) Red	sqm	545.86
		(c) Yellow	sqm	563.46
M-200	Kerb-Stone Block- M30 Grade (Size 375mm x 300mm x150mm ) inclusive of OH & CP		each	76.04
M-201	Autoclaved Aerated Concrete (AAC) Block		cum	2248.07

  
26/2/19  
सदस्य

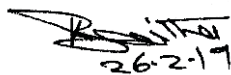
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

  
26/2/19  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य


राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

  
26.2.19  
सदस्य

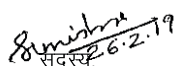
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-सह-मुख्य अभियंता (असै०), बिहार  
स्टेट पावर होल्डिंग कंपनी लिमिटेड  
बिहार, पटना।

  
26/02/19  
सदस्य

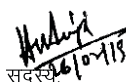
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-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

  
26.2.19  
सदस्य,

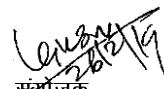
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-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

  
26.2.19  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार,  
पटना।

  
26/02/19  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

  
26/2/19  
सह-अध्यक्ष,

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष  
सचिव,  
पथ निर्माण विभाग, बिहार, पटना।



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# **PLANT & MACHINERY RATE**

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**Schedule - P&M / MORTH - 1A**

Dt. 26.02.2019

**Approved Usages Rates of Plants and Machinery. The Usages charges for the machines include ownership charges, cost of repair & maintenance including replacement of tyre and running and operating charges which includes crew, fuel & lubricants. These rates are for the preparation of Schedule of Rates only.**

Sl. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
P&M-001	Air Compressor	General Purpose	capacity in cfm	170/250	hour	481.00
P&M-002	Batching and Mixing Plant (a) 30 cum capacity	Concrete Mixing	cum/hour	20	hour	2851.00
P&M-003	Batching and Mixing Plant (b) 15 - 20 cum capacity	Concrete Mixing	cum/hour	13	hour	1853.00
P&M-004	Bitumen Pressure Distributor	Applying bitumen tack coat	sqm/hour	1750	hour	1613.00
P&M-005	Bitumen Boiler oil fired	Bitumen Spraying	capacity in litre	1500	hour	298.00
P&M-006	Concrete Paver Finisher with 40 HP Motor	Paving of concrete surface	cum / hour	20	hour	1470.00
P&M-007	Concrete Pump of 45 & 30 cum capacity	Pumping of concrete	cum / hour	33 / 22	hour	385.00
P&M-008	Concrete Bucket	For Pouring concrete	capacity in cum	1	hour	24.20
P&M-009	Concrete Mixer (a) 0.4/0.28 cum	Concrete Mixing	cum/hour	2.5	hour	82.30
P&M-010	Concrete Mixer (b) 1 cum	Concrete Mixing	cum/hour	7.5	hour	247.00
P&M-011	Crane (a) 80 tonnes	Lifting Purpose			hour	1925.00
P&M-012	Cranes b) 35 tonnes	Lifting Purpose			hour	1282.00
P&M-013	Cranes c) 3 tonnes	Lifting Purpose			hour	537.00
P&M-014	Dozer D - 80 - A 12	Spreading /Cutting / Clearing	cum/hour	300/ 150/250	hour	5598.00
P&M-015	Dozer D - 50 - A 15	Spreading /Cutting / Clearing	cum/hour	200/ 120/150	hour	3319.00
P&M-016	Emulsion Pressure Distributor	Applying emulsion tack coat	sqm/hour	1750	hour	1203.00
P&M-017	Front End loader 1 cum bucket capacity	Soil loading / Aggregate loading	cum/hour	60 /25	hour	1373.00
P&M-018	Generator (a) 125 KVA	Genration of electric Energy	KVA	100	hour	2637.00
P&M-019	Generator( b) 63 KVA	Genration of electric Energy	KVA	50	hour	1062.00
P&M-020	GSB Plant 50 cum	Producing GSB	cum/hour	40	hour	1564.00
P&M-021	Hotmix Plant - 120 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	40	hour	51428.00
P&M-022	Hotmix Plant - 100 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	30	hour	39088.00
P&M-023	Hotmix Plant - 60 to 90 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	25	hour	32919.00
P&M-024	Hotmix Plant - 40 to 60 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	17	hour	23018.00
P&M-025	Hydraulic Chip Spreader	Surface Dressing	sqm/hour	1500	hour	3964.00
P&M-026	Hydraulic Excavator of 1 cum bucket	Soil Ordinary/Soil Marshy / Soil Unsuitable	cum/hour	60 /60 /60	hour	1958.00
P&M-027	Integrated Stone Crusher 100THP	Crushing of Spalls	TPH	100	hour	13036.00
P&M-028	Integrated Stone Crusher 200 THP	Crushing of Spalls	TPH	200	hour	27425.00
P&M-029	Kerb Casting Machine	Kerb Making	Rm/hour	80	hour	467.00
P&M-030	Mastic Cooker	Mastic Wearing coat	capacity in tonne	1	hour	92.70
P&M-031	Mechanical Broom Hydraulic	Surface Cleaning	sqm/hour	1250	hour	555.00
P&M-032	Motor Grader 3.35 mtr blade	Clearing /Spreading /GSB /WBM	cum/hour	200/200/50/50	hour	2697.00
P&M-033	Mobile slurry seal equipment	Mixing and laying slurry seal	sqm/hour	2700	hour	1516.00
P&M-034	Paver Finisher Hydrostatic with sensor control 100 TPH	Paving of DBM/ BM/SDC/ Premix	cum/hour	40	hour	3505.00
P&M-035	Paver Finisher Mechanical 100 TPH	Paving of WMM /Paving of DLC	cum/hour	40/30	hour	1390.00
P&M-036	Piling Rig with Bantonite Pump	0.75 m dia to 1.2 m dia Boring attachment	Rm/hour	2 to 3	hour	8220.00
P&M-037	Pneumatic Road Roller	Rolling of Asphalt Surface	cum/hour	25	hour	1872.00
P&M-038	Pneumatic Sinking Plant	Pneumatic Sinking of wells	cum/hour	1.5 to 2.00	hour	6273.00

Sl. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
P&M-039	Pot Hole Repair Machine	Repair of potholes	cum/hour	4	hour	1363.00
P&M-040	Prestressing Jack with Pump & access	Stressing of steel wires/stands			hour	194.00
P&M-041	Ripper	Scarifying	cum/hour	60	hour	43.20
P&M-042	Rotavator	Scarifying	cum/hour	25	hour	26.30
P&M-043	Road marking machine	Road marking	Sqm/hour	100	hour	141.00
P&M-044	Smooth Wheeled Roller 8 tonne	Soil Compaction /BM Compaction	cum/hour	70/25	hour	781.00
P&M-045	Tandem Road Roller	Rolling of Asfalt Surface	cum/hour	30	hour	1722.00
P&M-046	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	km	36.90
P&M-047	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	tonne.km	8.86
P&M-048	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	hour	1018.00
P&M-049	Transit Mixer 4.0/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	hour	1398.00
P&M-050	Transit Mixer 4/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	tonne.km	6.94
P&M-051	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	hour	1282.00
P&M-052	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	tonne.km	9.24
P&M-053	Tractor	Pulling	capacity in HP	50	hour	546.00
P&M-054	Tractor with Rotevator	Rate of Tractor + Rotevator			hour	570.00
P&M-055	Tractor with Ripper	Rate of Tractor 6+ Ripper			hour	588.00
P&M-056	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	km	32.70
P&M-057	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	hour	929.00
P&M-058	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	tonne.km	3.47
P&M-059	Vibratory Roller 8 tonne	Earth or soil / GSB / WBM	cum/hour	100/60/60	hour	2029.00
P&M-060	Water Tanker	Water Transport	capacity in KL	6	hour	183.00
P&M-061	Water Tanker	Water Transport	capacity in KL	6	km	37.90
P&M-062	Wet Mix Plant 60 TPH	Wet Mix	cum/hour	25	hour	1812.00
Sl. No.	Description of Machine				Unit	Rate (Rs)
P&M-063	Air compressor with pneumatic chisel attachment for cutting hard clay.				hour	934.00
P&M-064	Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour				hour	3730.00
P&M-065	Belt conveyor system				hour	input
P&M-066	Boat to carry atleast 20 persons				hour	234.00
P&M-067	Cement concrete batch mix plant @ 175 cum per hour (effective output)				hour	7833.00
P&M-068	Cement concrete batch mix plant @ 75 cum per hour				hour	3356.00
P&M-069	Cold milling machine @ 20 cum per hour				hour	1398.00
P&M-070	Crane 5 tonne capacity				hour	1282.00
P&M-071	Crane 10 tonne capacity				hour	1282.00
P&M-072	Crane 15 tonne capacity				hour	1282.00
P&M-073	Crane 20 tonne capacity				hour	1282.00
P&M-074	Crane 40 T capacity				hour	1925.00
P&M-075	Crane with grab 0.75 cum capacity				hour	1925.00
P&M-076	Compressor with guniting equipment along with accessories				hour	234.00
P&M-077	Drum mix plant for cold mixes of appropriate capacity but not less than 75 tonnes/hour.				hour	1812.00
P&M-078	Epoxy Injection gun				hour	174.00
P&M-079	Generator 33 KVA				hour	559.00
P&M-080	Generator 100 KVA				hour	1923.00

Sl. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
P&M-081	Generator 250 KVA				hour	3691.00
P&M-082	Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking.				hour	input
P&M-083	Joint Cutting Machine with 2-3 blades (for rigid pavement)				hour	350.00
P&M-084	Jack for Lifting 40 tonne lifting capacity.				day	1282.00
P&M-085	Piling rig Including double acting pile driving hammer (Hydraulic rig)				hrs	8220.00
P&M-086	Plate compactor				hour	467.00
P&M-087	Snow blower equipment 140 HP @ 600 cum per hour				hour	input
P&M-088	Texturing machine (for rigid pavement)				hour	118.00
P&M-089	Truck Trailor 30 tonne capacity				hour	3730.00
P&M-090	Truck Trailor 30 tonne capacity				t.km	3.47
P&M-091	Tunnel Boring machine				hour	input
P&M-092	Vibrating Pile driving hammer complete with power unit and accessories.				hour	input
P&M-093	Wet Mix Plant 100 TPH				hour	2791.00
P&M-094	Wet Mix Plant 75 TPH				hour	2791.00

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
26-2-19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै०), बिहार  
स्टेट पावर होल्डिंग कंपनी लिमिटेड  
बिहार, पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

सदस्य  
26-2-19  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार,  
पटना।

सदस्य  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

संयोजक,  
26/2/19  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर  
आयुक्त-सह-विशेष सचिव, पथ निर्माण विभाग,  
बिहार, पटना।

## Schedule - P & M / MORTH -1 B

Dt. :- 26.02.2019

Approved Usages Rates of Plants and Machinery. The Usages charges for the machines include ownership charges, cost of repair & maintenance including replacement of tyre and running and operating charges which includes crew, fuel & lubricants. These rates are for the preparation of Schedule of Rates only.						
Sl. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate
1	WMM Paver Finisher	Paving of WMM/Paving of DLC.	Cum/hour		hour	1598.00
2	Tipping Truck 14 M ^3	Transportation of Soil, GSB, WMM, Hot mix etc.	Capacity in cum		hour	2323.00
3	6.5 KVA Generator	Generation of electric Energy	KVA		hour	258.00
4	Vibratory Earth Compactor		Cum/hour		hour	1849.00
5	Tractor (25 HP)	Carriage	25 HP Capacity	2.25 cum	hour	525.00
6	5 KVA Silent Type Generator	Generation of electric Energy	KVA		hour	225.00
7	Mini HOT MIX PLANT - (6-10) TPH		Cum/hour	2.7	hour	3601.00

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असैठ), बिहार स्टेट पावर होल्डिंग कंपनी लिमिटेड, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह  
-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव,  
पथ निर्माण विभाग, बिहार, पटना।



## Schedule - HMP1

Date: 26.02.19

पथ निर्माण विभाग में उपलब्ध Hot Mix Plant एवं अन्य संलग्न यंत्रों-संयंत्रों से तैयार किये जा रहे Production/Carriage/ Laying/Compaction का Usage Charge Per MT की पुनरीक्षित दर गणना

Sr. No.	P& M Code	Machinery	Unit	Quantity	Rate (₹)	Cost (₹)
1	P&M-024	Batch mix HMP 40-60 TPH @ 37.4 tonne per hour actual output	hour	6.000	23018.00	138108.00
2	P&M-031	Mechanical broom hydraulic @ 1250 sqm per hour	hour	2.200	555.00	1221.00
3	P&M-035	Paver finisher Mechanical	hour	6.000	1390.00	8340.00
		OR				
3	P&M-034	Sensor Paver Finisher	hour	6.000	3505.00	21030.00
4	P&M-018	Generator 125 KVA	hour	6.000	2637.00	15822.00
5	P&M-017	Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00
6	P&M-044	Smooth wheeled Roller 8 -10 tonnes for initial break down rolling	hour	12.00x0.65*	781.00	6091.80
7	P&M-059	Vibratory Roller 8 - 10 tonnes for intermediate rolling	hour	6.00x0.65*	2029.00	7913.10

**Total cost of usages charge using Paver Finisher ( Mechanical ) in Rupees ₹ 185733.90**

and

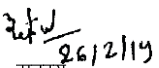
**Total cost of usages charge using Paver Finisher (Sensor ) in Rupees ₹ 198423.90**

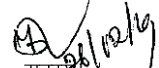
Output of Plant = 17\*2.2\*6 = 224.4 MT per day

- (a) Cost per MT with Mechanical Paver finisher **185733.9 / 224.4 = 827.70**  
(with 0.0 km Lead) = Say ₹ **828.00 / MT**
- and
- (b) Cost per MT with Sensor Paver finisher **198423.9 / 224.4 = 884.20**  
(with 0.0 km Lead) = Say ₹ **884.00 / MT**

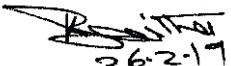
In addition to the above, following points shall be considered while calculating Usages Rate per MT :-


- (i) **For carriage of Mix by Tipper @ ₹8.2 per t-km will be charged extra as per Lead from the Government Hot Mix Plant.**
- (ii) **The cost of labour for Bitumen feeding & laying at Paver site will be arranged by the Contractor.**


  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

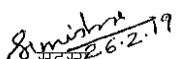
  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

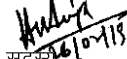
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

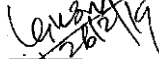
  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै०), बिहार  
स्टेट पावर होल्डिंग कंपनी लिमिटेड  
बिहार, पटना।

  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार,  
पटना।

  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

  
संयोजक,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर  
आयुक्त-सह-विशेष सचिव, पथ निर्माण विभाग,  
बिहार, पटना।

## Schedule - WMP1

Date: 26.02.19

पथ निर्माण विभाग में उपलब्ध **Wet Mix Macadam (WMM) Plant** एवं अन्य संलग्न यंत्रों-संयंत्रों से तैयार किये जा रहे **Production/Carriage/ Laying/Compaction** का **Usage Charge Per MT** की पुनरीक्षित दर गणना

Sr. No.	P& M Code	Machinery	Unit	Quantity	Rate (₹)	Cost (₹)
1	P&M-094	Wet Mix Macadam Plant 75 TPH @ 68.75 tonne per hour actual output	hour	6.000	2791.00	16746.00
2	P&M-031	Mechanical broom hydraulic @ 1250 sqm per hour	hour	2.200	555.00	1221.00
3	-	WMM Paver finisher	hour	6.000	1598.00	9588.00
4	P&M-080	Generator 100 KVA	hour	6.000	1923.00	11538.00
5	P&M-017	Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00
6	P&M-044	Smooth wheeled Roller 8 - 10 tonnes for initial break down rolling	hour	6.00x0.65*	781.00	3046.00
7	P&M-059	Vibratory Roller 8 - 10 tonnes for intermediate rolling	hour	6.00x0.65*	2029.00	7913.00
8	-	Vibratory Earth Compactor	hour	6.00x0.65*	1849.00	7211.00

**Total cost in Rupees (₹) 65501.00**

Output of Plant = 31.25\*2.2\*6 = 412.5 MT per day

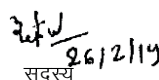
Cost per MT (with 0.0 km Lead) = **65501.0 / 412.5 = 158.80**

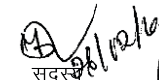
Say ₹ **159.00 / MT**

In addition to the above, following points shall be considered while calculating Usages Rate per MT :-

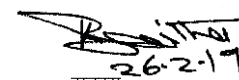
**For carriage of Mix by Tipper @ ₹8.2 per t-km will be charged extra as per Lead from the Government Hot Mix Plant.**

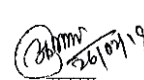
**The cost of Labour at Plant site & laying at Paver site will be arranged by the Contractor.**


  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

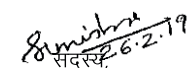
  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

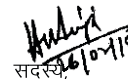
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

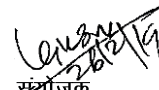
  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असो), बिहार  
स्टेट पावर होल्डिंग कंपनी लिमिटेड  
बिहार, पटना।

  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार,  
पटना।

  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

  
सह-अध्यक्ष,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर  
आयुक्त-सह-विशेष सचिव, पथ निर्माण विभाग,  
बिहार, पटना।

## Schedule - HMP2(Mini HMP)

Date : 26.02.19

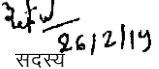
पथ निर्माण विभाग में उपलब्ध Mini Hot Mix Plant एवं अन्य संलग्न यंत्रों-संयंत्रों से तैयार किये जा रहे Production/Carriage/ Laying/Compaction का Usage Charge Per MT की पुनरीक्षित दर गणना

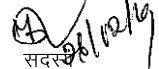
Sr. No.	P& M Code	Machinery	Unit	Quantity	Rate (₹)	Cost (₹)
1		Mini Hot Mix Plant 6-10 TPH @ 5.96 tonne per hour actual output	hour	6.000	3601.00	21606.00
2	P&M-044	Smooth wheeled Roller 8 -10 tonnes for initial break down rolling	hour	6.00x0.65*	781.00	3046.00
<b>Total cost of usages charge in Rupees ₹</b>						<b>24652.00</b>

Output of Plant = 35.76 MT per day

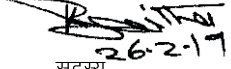
(a) Cost per MT (with 0.0 km Lead) =  $\frac{24652.0}{35.76} = 689.40$

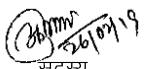
Say ₹ 689.00 / MT


  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

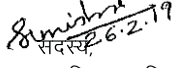
  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

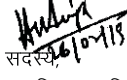
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

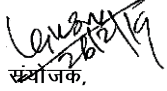
  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै०), बिहार  
स्टेट पावर होल्डिंग कंपनी लिमिटेड  
बिहार, पटना।

  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार,  
पटना।

  
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

  
सह-अभियंता,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर  
आयुक्त-सह-विशेष सचिव, पथ निर्माण विभाग,  
बिहार, पटना।



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# INPUT USED IN SOR

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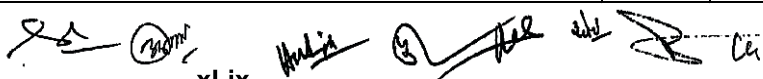
# INPUT

## (A) Usage Rates of Plant and Machinery

Sr. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
P&M-001	Air Compressor	General Purpose	capacity in cfm	170/250	hour	481.00
P&M-002	Batching and Mixing Plant (a) 30 cum capacity	Concrete Mixing	cum/hour	20	hour	2851.00
P&M-003	Batching and Mixing Plant (b) 15 - 20 cum capacity	Concrete Mixing	cum/hour	13	hour	1853.00
P&M-004	Bitumen Pressure Distributor	Applying bitumen tack coat	sqm/hour	1750	hour	1613.00
P&M-005	Bitumen Boiler oil fired	Bitumen Spraying	capacity in litre	1500	hour	298.00
P&M-006	Concrete Paver Finisher with 40 HP Motor	Paving of concrete surface	cum / hour	20	hour	1470.00
P&M-007	Concrete Pump of 45 & 30 cum capacity	Pumping of concrete	cum / hour	33 / 22	hour	385.00
P&M-008	Concrete Bucket	For Pouring concrete	capacity in cum	1	hour	24.20
P&M-009	Concrete Mixer (a) 0.4/0.28 cum	Concrete Mixing	cum/hour	2.5	hour	82.30
P&M-010	Concrete Mixer (b) 1 cum	Concrete Mixing	cum/hour	7.5	hour	247.00
P&M-011	Crane (a) 80 tonnes	Lifting Purpose			hour	1925.00
P&M-012	Crane (b) 35 tonnes	Lifting Purpose			hour	1282.00
P&M-013	Crane (c) 3 tonnes	Lifting Purpose			hour	537.00
P&M-014	Dozer D - 80 - A 12	Spreading /Cutting / Clearing	cum/hour	300/150/250	hour	5598.00
P&M-015	Dozer D - 50 - A 15	Spreading /Cutting / Clearing	cum/hour	200/120/150	hour	3319.00
P&M-016	Emulsion Pressure Distributor	Applying emulsion tack coat	sqm/hour	1750	hour	1203.00
P&M-017	Front End loader 1 cum bucket capacity	Soil loading / Aggregate loading	cum/hour	60 /25	hour	1373.00
P&M-018	Generator (a) 125 KVA	Generation of electric Energy	KVA	100	hour	2637.00
P&M-019	Generator (b) 63 KVA	Generation of electric Energy	KVA	50	hour	1062.00
P&M-020	GSB Plant 50 cum	Producing GSB	cum/hour	40	hour	1564.00
P&M-021	Hotmix Plant - 120 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	40	hour	51428.00
P&M-022	Hotmix Plant - 100 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	30	hour	39088.00
P&M-023	Hotmix Plant - 60 to 90 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	25	hour	32919.00
P&M-024	Hotmix Plant - 40 to 60 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	17	hour	23018.00
P&M-025	Hydraulic Chip Spreader	Surface Dressing	sqm/hour	1500	hour	3964.00
P&M-026	Hydraulic Excavator of 1 cum bucket	Soil Ordinary/Soil Marshy / Soil	cum/hour	60 /60 /60	hour	1958.00
P&M-027	Integrated Stone Crusher 100THP	Crushing of Spalls	TPH	100	hour	13036.00
P&M-028	Integrated Stone Crusher 200 HP	Crushing of Spalls	TPH	200	hour	27425.00
P&M-029	Kerb Casting Machine	Kerb Making	Rm/hour	80	hour	467.00
P&M-030	Mastic Cooker	Mastic Wearing coat	capacity in tonne	1	hour	92.70
P&M-031	Mechanical Broom Hydraulic	Surface Cleaning	sqm/hour	1250	hour	555.00
P&M-032	Motor Grader 3.35 mtr blade	Clearing /Spreading /GSB /WBM	cum/hour	200/200/50/50	hour	2697.00
P&M-033	Mobile slurry seal equipment	Mixing and laying slurry seal	sqm/hour	2700	hour	1516.00
P&M-034	Paver Finisher Hydrostatic with sensor control 100 TPH	Paving of DBM/ BM/SDC/ Premix	cum/hour	40	hour	3505.00
P&M-035	Paver Finisher Mechanical 100 TPH	Paving of WMM /Paving of DLC	cum/hour	40/30	hour	1390.00
P&M-036	Piling Rig with Bantonite Pump	0.75 m dia to 1.2 m dia Boring attachment	Rm/hour	2 to 3	hour	8220.00
P&M-037	Pneumatic Road Roller	Rolling of Asphalt Surface	cum/hour	25	hour	1872.00
P&M-038	Pneumatic Sinking Plant	Pneumatic Sinking of wells	cum/hour	1.5 to 2.00	hour	6273.00
P&M-039	Pot Hole Repair Machine	Repair of potholes	cum/hour	4	hour	1363.00
P&M-040	Prestressing Jack with Pump & access	Stressing of steel wires/stands			hour	194.00
P&M-041	Ripper	Scarifying	cum/hour	60	hour	43.20
P&M-042	Rotavator	Scarifying	cum/hour	25	hour	26.30
P&M-043	Road marking machine	Road marking	sqm/hour	100	hour	141.00

## INPUT

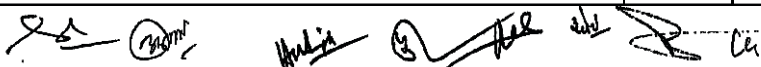
Sr. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
P&M-044	Smooth Wheeled Roller 8 tonne	Soil Compaction /BM Compaction	cum/hour	70/25	hour	781.00
P&M-045	Tandem Road Roller	Rolling of Asfalt Surface	cum/hour	30	hour	1722.00
P&M-046	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	capacity in cum	5.5	km	36.90
P&M-047	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	capacity in cum	5.5	tonne.km	8.86
P&M-048	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	capacity in cum	5.5	hour	1018.00
P&M-049	Transit Mixer 4.0/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	hour	1398.00
P&M-050	Transit Mixer 4/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	tonne.km	6.94
P&M-051	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	hour	1282.00
P&M-052	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	tonne.km	9.24
P&M-053	Tractor	Pulling	capacity in HP	50	hour	546.00
P&M-054	Tractor with Rotevator	Rate of Tractor + Rotevator			hour	570.00
P&M-055	Tractor with Ripper	Rate of Tractor 6+ Ripper			hour	558.00
P&M-056	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	km	32.70
P&M-057	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	hour	929.00
P&M-058	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	tonne.km	3.47
P&M-059	Vibratory Roller 8 tonne	Earth or soil / GSB / WBM	cum/hour	100/60/60	hour	2029.00
P&M-060	Water Tanker	Water Transport	capacity in KL	6	hour	183.00
P&M-061	Water Tanker	Water Transport	capacity in KL	6	km	37.90
P&M-062	Wet Mix Plant 60 TPH	Wet Mix	cum/hour	25	hour	1812.00
Sr. No.	Description of Machine				Unit	
P&M-063	Air compressor with pneumatic chisel attachment for cutting hard clay				hour	934.00
P&M-064	Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour				hour	3730.00
P&M-065	Belt conveyor system				hour	input
P&M-066	Boat to carry atleast 20 persons				hour	234.00
P&M-067	Cement concrete batch mix plant @ 175 cum per hour (effective output)				hour	7833.00
P&M-068	Cement concrete batch mix plant @ 75 cum per hour				hour	3356.00
P&M-069	Cold milling machine @ 20 cum per hour				hour	1398.00
P&M-070	Crane 5 tonne capacity				hour	1282.00
P&M-071	Crane 10 tonne capacity				hour	<b>1282.00</b>
P&M-072	Crane 15 tonne capacity				hour	<b>1282.00</b>
P&M-073	Crane 20 tonne capacity				hour	<b>1282.00</b>
P&M-074	Crane 40 T capacity				hour	<b>1925.00</b>
P&M-075	Crane with grab 0.75 cum capacity				hour	<b>1925.00</b>
P&M-076	Compressor with guniting equipment along with accessories				hour	234.00
P&M-077	Drum mix plant for cold mixes of appropriate capacity but not less than 75 tonnes/hour.				hour	1812.00
P&M-078	Epoxy Injection gun				hour	174.00
P&M-079	Generator 33 KVA				hour	559.00
P&M-080	Generator 100 KVA				hour	1923.00
P&M-081	Generator 250 KVA				hour	3691.00





## INPUT

Sr. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
P&M-082	Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking.				hour	input
P&M-083	Joint Cutting Machine with 2-3 blades (for rigid pavement)				hour	350.00
P&M-084	Jack for Lifting 40 tonne lifting capacity.				day	1282.00
P&M-085	Piling rig Including double acting pile driving hammer (Hydraulic rig)				hrs	8220.00
P&M-086	Plate compactor				hour	467.00
P&M-087	Snow blower equipment 140 HP @ 600 cum per hour				hour	input
P&M-088	Texturing machine (for rigid pavement)				hour	118.00
P&M-089	Truck Trailor 30 tonne capacity				hour	3730.00
P&M-090	Truck Trailor 30 tonne capacity				t.km	3.47
P&M-091	Tunnel Boring machine				hour	input
P&M-092	Vibrating Pile driving hammer complete with power unit and accessories.				hour	input
P&M-093	Wet Mix Plant 100 TPH				hour	2791.00
P&M-094	Wet Mix Plant 75 TPH				hour	2791.00
Sr. No.	Description of Labour				Unit	Rate (Rs)
L-01	Blacksmith (IInd class)				day	307.00
L-02a	Blacksmith (Ist class)				day	345.00
L-02b	Welder				day	386.00
L-02c	Plumber				day	326.00
L-02d	Electrician				day	326.00
L-03	Blaster (Stone cutter)				day	425.00
L-04	Carpenter I Class				day	345.00
L-05	Chiseller (Head Mazdoor)				day	323.00
L-06	Driller (Jumper)				day	307.00
L-07	Diver (Sarang)				day	367.00
L-08	Fitter				day	351.00
L-09	Mali				day	323.00
L-10	Mason (IInd class)				day	307.00
L-11	Mason (Ist class)				day	345.00
L-12	Mate / Supervisor				day	272.00
L-13	Mazdoor				day	257.00
L-14	Mazdoor/Dresser (Semi Skilled)				day	268.00
L-15	Mazdoor/Dresser/Sinker (Skilled)				day	325.00
L-16	Medical Officer				day	958.00
L-17	Operator(grouting)				day	286.00
L-18	Painter I class				day	326.00
L-19	Para medical personnel				day	471.00
(C) Materials						
Sr. No.	Description of Material				Unit	Rate (Rs)
M-001	Stone Boulder of size 150 mm and below at Quarry				cum	303.85
M-002	Supply of quarried stone 150 - 200 mm size for Hand Broken at Quarry				cum	303.85
M-003	Boulder with minimum size of 300 mm for Pitching at Quarry				cum	303.85
M-004	Coarse sand at source Quarry Koliwar sand/sone sand				cum	150.80
M-005	Coarse sand (Equivalent to Koliwar sand)				cum	150.80

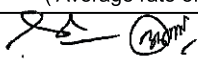


## INPUT

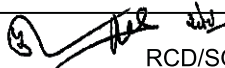
Sr. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
M-006	Fine sand at Quarry				cum	116.85
M-007	Moorum at Quarry				cum	131.28
M-008	Gravel/Quarry spall at Quarry				Cum	303.85
M-009	Granular Material or hard murrum for GSB works at Quarry				Cum	131.53
M-010	Granular Material or hard murrum for GSB works at Quarry				Cum	131.53
M-011	Fly ash conforming to IS: 3812 ( Part II & I) at source				Cum	0.00
M-012	Filter media/Filter Material as per Table 300-3 (MoRT&H Specification) at Quarry				Cum	408.83
	<b>Description of Material</b>			<b>Unit</b>	<b>Rate (Rs) at Plant (HMP /</b>	
M-013	Close graded Granular sub-base Material 53 mm to 9.5 mm at Quarry			cum	516.42	516.42
M-014	Close graded Granular sub-base Material 37.5 mm to 9.5 mm at Quarry			cum	492.71	492.71
M-015	Close graded Granular sub-base Material 26.5 mm to 9.5 mm at Quarry			cum	553.32	553.32
M-016	Close graded Granular sub-base Material 9.5 mm to 4.75 mm at Quarry			cum	531.40	531.4
M-017	Close graded Granular sub-base Material 9.5 mm to 2.36 mm at Quarry			cum	411.33	411.33
M-018	Close graded Granular sub-base Material 4.75mm to 2.36 mm at Quarry			cum	202.91	202.91
M-019	Close graded Granular sub-base Material 4.75mm to 75 micron mm at Quarry			cum	188.40	188.4
M-020	Close graded Granular sub-base Material 2.36 mm at Quarry			cum	188.40	188.4
M-021	Stone crusher dust finer than 3mm with not more than 10% passing 0.075 sieve at Quarry			cum	97.14	97.14
M-022	Coarse graded Granular sub-base Material 2.36 mm & below at Quarry			cum	185.94	185.94
M-023	Coarse graded Granular sub-base Material 4.75mm to 75 micron mm at Quarry			cum	185.94	185.94
M-024	Coarse graded Granular sub-base Material 4.75 mm to 2.36 mm at Quarry			cum	200.45	200.45
M-025	Coarse graded Granular sub-base Material 9.5 mm to 4.75 mm at Quarry			cum	528.94	528.94
M-026	Coarse graded Granular sub-base Material 26.5 mm to 4.75 mm at Quarry			cum	499.76	499.76
M-027	Coarse graded Granular sub-base Material 26.5 mm to 9.5 mm at Quarry			cum	550.85	550.85
M-028	Coarse graded Granular sub-base Material 37.5 mm to 9.5 mm at Quarry			cum	490.24	490.24
M-029	Coarse graded Granular sub-base Material 53 mm to 26.5 mm at Quarry			cum	458.22	458.22
M-030	Aggregates below 5.6 mm at Quarry			cum	200.45	200.45
M-031	Aggregates 22.4 mm to 2.36 mm at Quarry			cum	528.14	528.14
M-032	Aggregates 22.4 mm to 5.6 mm at Quarry			cum	528.14	528.14
M-033	Aggregates 45 mm to 2.8 mm at Quarry			cum	470.93	470.93
M-034	Aggregates 45 mm to 22.4 mm at Quarry			cum	479.11	479.11
M-035	Aggregates 53 mm to 2.8 mm at Quarry			cum	470.93	470.93
M-036	Aggregates 53 mm to 22.4 mm at Quarry			cum	458.22	458.22
M-037	Aggregates 63 mm to 2.8 mm at Quarry			cum	427.80	427.8
M-038	Aggregates 63 mm to 45 mm at Quarry			cum	427.69	427.69
M-039	Aggregates 90 mm to 45 mm at Quarry			cum	396.24	396.24
M-040	Aggregates 10 mm to 5 mm at Quarry			cum	528.94	528.94
M-041	Aggregates 11.2 mm to 0.09 mm at Quarry			cum	345.52	345.52
M-042	Aggregates 13.2 mm to 0.09 mm at Quarry			cum	470.04	470.04
M-043	Aggregates 13.2 mm to 5.6 mm at Quarry			cum	614.17	614.17

## INPUT

Sr. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
M-044	Aggregates 13.2 mm to 10 mm at Quarry			cum	642.67	642.67
M-045	Aggregates 20 mm to 10 mm at Quarry			cum	642.67	642.67
M-046	Aggregates 25 mm to 10 mm at Quarry			cum	612.59	612.59
M-047	Aggregates 19 mm to 6 mm at Quarry			cum	528.14	528.14
M-048	Aggregates 37.5 mm to 19 mm at Quarry			cum	479.11	479.11
M-049	Aggregates 37.5 mm to 25 mm at Quarry			cum	479.11	479.11
M-050	Aggregates 6 mm nominal size at Quarry			cum	408.74	408.74
M-051	Aggregates 10 mm nominal size at Quarry			cum	614.17	614.17
M-052	Aggregates 13.2/12.5 mm nominal size at Quarry			cum	642.67	642.67
M-053	Aggregates 20 mm nominal size at Quarry			cum	550.85	550.85
M-054	Aggregates 25 mm nominal size at Quarry			cum	525.31	525.31
M-055	Aggregates 40 mm nominal size at Quarry			cum	441.08	441.08
Sr. No.	Description of Material				Unit	Rate (Rs)
M-056	AC pipe 100 mm dia				metre	40.75
M-057	Acrylic polymer bonding coat				litre	input
M-058	Alluminium Paint				litre	110.75
M-059	Aluminium alloy plate 2mm Thick				sqm	8615.21
M-060	Aluminium alloy/galvanised steel				tonne	34460.81
M-061	Aluminium sheeting fixed with encapsulated lens type reflective sheeting including 2% towards lettering, cost of angle iron, cost of drilling holes, nuts, bolts etc. and signs as applicable				sqm	8035.86
M-062	Road Stud with Micro Prismatic lens reflectors( with shank)				each	165.38
M-063	Barbed wire				kg	61.21
M-064	Bearing (Cost of parts)				nos	input
M-065	Bearing (Cast steel rocker bearing assembly of 250 tonne )				nos	77610.30
M-066	Bearing (Elastomeric bearing assembly consisting of 7 internal layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation)				cubic cm	0.59
M-067	Bearing (Forged steel roller bearing of 250 tonne				nos	45625.63
M-068	Bearing (Pot type bearing assembly consisting of a metal piston supported by a disc, PTFE pads providing sliding surfaces against stainless steel mating together with cast steel assemblies / fabricated structural steel assemblies duly painted with all components				nos	137.10
	(a) Fixed POT-PTFE Bearing				MT	137.10
	(b) Free POT-PTFE Bearing				MT	146.90
	(c) Guide Slide (L) POT-PTFE Bearing				MT	156.70
	(d) Guide Slide (T) POT-PTFE Bearing				MT	151.80
M-069	Bearing (PTFE sliding plate bearing assembly of 80 tonnes )				nos	input
M-070	Bearing (Supply of sliding plate bearing of 80 tonne)				nos	30724.33
M-071	Bentonite				kg	3.55
M-072	Binding wire				kg	62.27
M-073	Bitumen ( Cationic Emulsion ) Ex- Patna(R.S1) Packed				tonne	37539.00
M-074	Bitumen (60-70 grade) Ex- Barauni Packed				tonne	32830.00
M-075	Bitumen (80-100 grade ) Ex- Barauni Packed				tonne	32030.00
M-076	Bitumen (Cutback ) Ex- Barauni Packed(60/70)				tonne	32830.00
M-077	Bitumen (Emulsion) Ex- Patna (M.S) Packed				tonne	39475.00
M-078	Bitumen (modified graded) Ex - Barauni (CRMB - 55) Packed				tonne	34920.00
M-079	Brick - Patna Urban				each	6.214
M-080	C.I. Shoes for the pile				kg	43.17
M-081	Cement (OPC at Patna)				tonne	5156.00
M-082	TMT bars (HYSD Bars) ( Average rate of Fe 500)				tonne	42532.00



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## INPUT

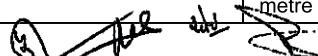
Sr. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
M-083	Collar for joints 300 mm dia				nos	input
M-084	Compressible Fibre Board (20mm thick)				sqm	988.42
M-085	Connectors /Staples				each	input
M-086	Copper Plate (12m long x 250mm wide)				kg	746.00
M-087	Corrosion resistant Structural steel				tonne	42131.76
M-088	Corrugated sheet, 3 mm thick, "Thrie" beam section railing				kg	45.04
M-089	Credit for excavated rock found suitable for use				cum	222.81
M-090	Curing compound				litre	120.27
M-091	Delineators from ISI certified firm as per the standard drawing given in IRC - 79				each	776.17
M-092	Earth Cost or compensation for earth taken from private land				cum	23.78
M-093	Elastomeric slab seal expansion joint assembly manufactured by using chloroprene, elastomer for elastomeric slab unit conforming to clause 915.1 of IRC: 83 (part II)				metre	25876.07
M-094	Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each				100 nos	572.86
M-095	Epoxy compound with accessories for preparing epoxy mortar				kg	550.68
M-096	Epoxy mortar				kg	721.64
M-097	Epoxy primer				kg	12.59
M-098	Epoxy resin-hardner mix for prime coat				kg	668.67
M-099	Flag of red color cloth 600 x 600 mm				each	50.74
M-100	Flowering Plants				each	33.83
M-101	Galvanised MS flat clamp				nos	14.70
M-102	Galvanised steel wire crates of mesh size 100 mm x 100 mm woven with 4mm dia. GI wire in rolls of required size				sqm	95.72
M-103	Galvanised structural steel plate 200 mm wide, 6 mm thick, 24 m long				kg	42.10
M-104	Gelatin 80%				kg	781.83
M-105	Geo grids				sqm	input
M-106	Geomembrane				sqm	input
M-107	Geonets				sqm	101.66
M-108	Geotextile				sqm	79.47
M-109	Geotextile filter fabric				sqm	79.47
M-110	GI bolt 10 mm Dia				nos	15.82
M-111	Grouting pump with agitator				hour	140.04
M-112	Grass (Doob)				kg	4.38
M-113	Grass (Fine)				kg	4.38
M-114	HDPE pipes 75mm dia				metre	191.60
M-115	HDPE pipes 90mm dia				metre	191.60
M-116	Hedge plants				nos	33.83
M-117	Helical pipes 600mm diameter				metre	input
M-118	Hot applied thermoplastic compound (Sp. Gravity - 2.10)				litre	192.38
M-119	HTS strand				tonne	69872.80
M-120	Joint Sealant Compound				kg	24.05
M-121	Jute netting, open weave, 2.5 cm square opening for seeding and Mulching				sqm	33.66
M-122	LDO for steam curing				litre	input
M-123	M.S. Clamps				nos	35.97
M-124	M.S. Clamps				kg	65.11
M-125	M.S.shoes @ 35 Kg per pile of 15 m				kg	24.90
M-126	Mild Steel bars				tonne	45903.00

## INPUT

Sr. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
M-127	Modular strip/box seal expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm assembly comprising of edge beams, central beam, 2 modules chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative				metre	28516.45
M-128	Modular strip/box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm box/box seal joint assembly containing 3 modules/cells and comprising of edge beams, two central beams, chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative				metre	input
M-129	Nipples 12mm				nos	input
M-130	Nuts and bolts				kg	61.19
M-131	Paint				litre	219.05
M-132	Pavement Marking Paint				litre	219.05
M-133	Paving Fabric				sqm	input
M-134	Perforated geosynthetic pipe 150 mm dia				metre	25.91
M-135	Perforated pipe of cement concrete, internal dia 100 mm				metre	106.55
M-136	Pesticide				kg	75.60
M-137	Pipes 200 mm dia, 2.5 m long for drainage				metre	168.15
M-138	Plastic sheath, 1.25 mm thick for dowel bars				sqm	14.35
M-139	Plastic tubes 50 cm dia, 1.2 m high				nos	input
M-140	Polymer braids				metre	input
M-141	Pre moulded Joint filler, 25 mm thick for expansion joint.				sqm	939.64
M-142	Pre-coated stone chips of 13.2 mm nominal size				cum	590.02
M-143	Preformed continuous chloroprene elastomer or closed cell foam sealing element with high tear strength, vulcanised in a single operation for the full length of a joint to ensure water tightness.				metre	input
M-144	Pre-moulded asphalt filler board				sqm	939.64
M-145	Pre-packed cement based polymer concrete of strength 45 Mpa at 28 days				kg	input
M-146	Primer				kg	12.07
M-147	Quick setting compound				kg	input
M-148	Random Rubble Stone				cum	288.85
M-149	RCC Pipe NP 4 heavy duty non presure pipe 1000 mm dia				metre	2744.50
M-150	RCC Pipe NP 4 heavy duty non presure pipe 1200 mm dia				metre	3901.83
M-151	RCC Pipe NP 4 heavy duty non presure pipe 300 mm dia				metre	502.61
M-152	Reflectorising glass beads				kg	63.57
M-153	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Copper Strips)				metre	input
M-154	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Galvanised carbon steel strips)				metre	input
M-155	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Glass reinforced polymer/fibre reinforced polymer/polymeric strips)				metre	input
M-156	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Stainless steel strips)				metre	input
M-157	Reinforcement strips 60 mm wide 5 mm thick as per clause 3102. (Aluminium strips)				metre	input
M-158	Rivets				each	8.04
M-159	Sand bags (Cost of sand and Empty cement bag)				nos	7.46
M-160	Sapling 2 m high 25 mm dia				each	22.56
M-161	Scrap tyres of size 900 x 20				nos	75.17
M-162	Seeds				kg	33.83
M-163	Selected earth (Excluding royalty @ ₹22.0 per cum & compensation @ ₹1.65 per cum)				cum	23.78
M-164	Separation Membrane of impermeable plastic sheeting 125 micron thick				sqm	14.78
M-165	Sheathing duct				metre	82.70



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## INPUT

Sr. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
M-166	Shrubs				each	16.91
M-167	Sludge / Farm yard manure @ 0.18 cum per 100 sqm at site of work for turfing				cum	761.11
M-168	Sodium vapour lamp				each	input
M-169	Square Rubble Coursed Stone				cum	288.84
M-170	Steel circular hollow pole of standard specification for street lighting to mount light at 5 m height above deck level				each	input
M-171	Steel circular hollow pole of standard specification for street lighting to mount light at 9 m height above road level				each	input
M-172	Steel drum 300 mm dia 1.2 m high/empty bitumen drum				nos	125.91
M-173	Steel helmet and cushion block on top of pile head during driving.				kg	38.06
M-174	Steel pipe 25 mm external dia as per IS:1239				metre	123.51
M-175	Steel pipe 50 mm external dia as per IS:1239				metre	221.02
M-176	Steel wire rope 20 mm				kg	42.15
M-177	Steel wire rope 40 mm				kg	42.15
M-178	Strip seal expansion joint				metre	8027.80
M-179	Structural Steel (Average rate of $M_6 + M_8 + M_9$ )				tonne	44927.00
M-180	Super plastisizer admixture IS marked as per 9103-1999				kg	166.14
M-181	Synthetic Geogrids as per clause 3102.8 and approved design and specifications				sqm	input
M-182	Through and bond stone				nos	10.48
M-183	Tie rods 20mm diameter				nos	input
M-184	Tiles size 300 x 300 mm and 25 mm thick				each	39.73
M-185	Timber				cum	42224.54
M-186	Traffic cones with 150 mm reflective sleeve				nos	input
M-187	Tube anchorage set complete with bearing plate, permanent wedges etc.				nos	45.10
M-188	Unslaked lime				tonne	3555.38
M-189	Water				KL	253.69
M-190	Water based cement paint				litre	111.48
M-191	Welded steel wire fabric				kg	44.36
M-192	Wire mesh 50mm x 50mm size of 3mm wire				kg	42.86
M-193	Wooden ballies 2" Dia for bracing				each	20.98
M-194	Wooden ballies 8" Dia and 9 m long (9 m @ ₹67.94/m)				each	507.48
M-195	Wooden packing				cum	input
M-196	Wooden staff for fastening of flag 25 mm dia, 1.0 m long				each	26.23
M-197	Bitumen (30/40 grade) Ex-Patna Packed				tonne	34177.50
M-198	Fly Ash Brick conforming to IS: 3812 ( Part I & II ) (Excluding the carriage cost* of Fly Ash from point of production to Kiln site without OH &CP) (*Carriage cost of Fly Ash is same as sand) (cost of 1000 nos. is ₹5008)				each	5.008
M-199	Paver Block (Excluding GST )					
	(i) M -35 Grade and 60 mm thickness	(a) White			sqm	463.54
		(b) Red			sqm	471.80
		(c) Yellow			sqm	486.61
	(ii) M-40 Grade and 80 mm thickness	(a) White			sqm	531.94
		(b) Red			sqm	545.86
		(c) Yellow			sqm	563.46
M-200	Kerb-Stone Block- M30 Grade (Size:375mm x 300mm x150mm )				each	76.04
M-201	Autoclaved Aerated Concrete (AAC) Block				cum	2248.07
	Overheads for Road Works	0.06				
	Contractor's profit for Road Works	0.10				
	Overheads for Bridge Works	0.21				


for input of Overheads or Contractor's profit please type in column C as like below

## INPUT

Sr. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate (Rs)
	Overheads for Bridge Works (Rehabilitation)	0.26	}	Type symbol of apostrophe(') then input value then one space then symbol of percentage (%) for example ' 08 %		
	Contractor's profit for Bridge Works	0.10				
	Lead from Mixing Plant to working site	1.0 km				
	Lead for E/W borrow area to site	1.0 km				

  
सदस्य  
26/2/19

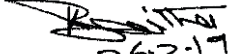
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समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

  
सदस्य  
26/2/19


राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

  
सदस्य  
26-2-19

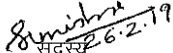
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असे०), बिहार  
स्टेट पावर होल्डिंग कंपनी लिमिटेड  
बिहार, पटना।

  
सदस्य  
26/2/19


राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग, बिहार, पटना।

  
सदस्य  
26/2/19

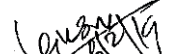
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,  
निगरानी विभाग, बिहार, पटना।

  
सदस्य  
26-2-19

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
लोक स्वास्थ्य अभियंत्रण विभाग, बिहार,  
पटना।

  
सदस्य  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

  
संयोजक,  
26/2/19

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर  
आयुक्त-सह-विशेष सचिव, पथ निर्माण विभाग,  
बिहार, पटना।



## INPUT

Item No.	Summary of Rates calculated and used for analysis of rates of other items	Unit	Rate (₹)
Item 8.3(ii)	Printing new letter and figures of any shade (ii) English Roman(With OH&CP)	per cm height per letter	0.48
Item 8.8	Painting Two Coats on New Concrete Surfaces(Including OH&CP)	sqm	66.00
Item 8.9	Painting angle iron post two coats(Including OH&CP)	sqm	57.80
Item 12.6 (B)	Cement mortar 1:2 (Excluding OH & CP)	cum	3848.00
Item 12.6 (A)	Cement mortar 1:3 (Excluding OH & CP)	cum	3030.00
Item 12.6 (D)	Cement mortar 1:6 (Excluding OH & CP)	cum	1929.00
Item 12.7 (A )	Course Rubble masonry in cement mortar 1:3 (including OH & CP)	cum	3083.00
Item 12.7 (Addl.B)	Random Rubble masonry in cement mortar 1:6 (including OH & CP)	cum	sor
Item 12.8 (A)	PCC Grade M15 including OH & CP for Open Foundation by Mixer	cum	3848.00
Item 12.8 (A)	PCC Grade M15 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	2780.00
Item 12.8 (B) PCC	PCC Grade M20 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	2958.00
Item 12.8 (C)	RCC Grade M20 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3027.00
Item 12.8 (C) II RCC	RCC Grade M20 including OH & CP for Open Foundation by Batching Plant	cum	4075.00
Item 12.8 C II RCC	RCC Grade M20 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	2944.00
Item 12.8 (D) i	PCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3244.00
Item 12.8 (D)	PCC Grade M25 including OH & CP for Open Foundation by Batching Plant	cum	4369.00
Item 12.8 (D)	PCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3164.00
Item 12.8 (E)	RCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3315.00
Item 12.8 (E) ii	RCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3233.00
Item 12.8 (F)	PCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3275.00
Item 12.8 (F) ii	PCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3191.00
Item 12.8 (G)	RCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3332.00
Item 12.8 (G) ii	RCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3251.00
Item 12.8 (H) Case I	RCC Grade M35 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3412.00
Item 12.8 (H) Case I	RCC Grade M35 for Open Foundation Per Cum(Including OH&CP) by Mixer	cum	4677.00
Item 12.8 (H) Case II	RCC Grade M35 including OH & CP for Open Foundation by Batching Plant	cum	4565.00
Item 12.8 (H)	RCC Grade M35 excluding OH & CP for Open Foundation by Batching Plant	cum	3330.00
Item 12.11 (C) i	PCC Grade M20 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3514.00
Item 12.11 (C) ii	PCC Grade M20 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3268.00
Item 12.11 (C) ii	PCC Grade M25 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3699.00
Item 12.11 (C) ii	PCC Grade M25 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3451.00
Item 12.11 (C) iii	PCC Grade M30 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3729.00
Item 12.11 (C) iii	PCC Grade M30 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3483.00
Item 12.11 (C) iv	PCC Grade M35 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3802.00
Item 12.11 (C) iv	PCC Grade M35 including OH & CP for Well Foundation (Bottom Plug) by Batching Plant	cum	4932.00
Item 12.11 (C) iv	PCC Grade M35 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3554.00
Item 12.11 (F) iv	RCC Grade M35 including OH & CP for Well Foundation (Well Cap) by Batching Plant	cum	4565.00
Item No. 3.13 A	Excavation for Structures (Manual Means)(including OH&CP)	cum	250.00
Item No. 3.13 B	Excavation for Structures (Mechanical Means)(Including OH&CP)	cum	54.00
Item 14.1(A)	RCC Grade M20 for super-structure including OH & CP by Batching Plant	cum	4652.00
Item 14.1(B)	RCC Grade M25 for super-structure including OH & CP by Batching Plant	cum	5135.00
Item 14.1(E)	PSC Grade M-40 for super-structure including OH & CP by Batching Plant	cum	5753.00
Item 14.1(C) case II. DIRECT	RCC Grade M30 for super-structure including formwork and excluding OH & CP by Batching Plant	cum	3904.00
Item 14.1(C) case II	RCC Grade M30 for super-structure excluding formwork and excluding OH & CP by Batching Plant	cum	3254.00

6



## INPUT

Item No.	Summary of Rates calculated and used for analysis of rates of other items	Unit	Rate (₹)
Item 14.2	Supplying ,fitting and placing HYSD bar reinforcement in super-structure Excluding OH & CP	tonne	48367.00
Item 13.6	Supplying, fitting and placing HYSD including OH & CP for sub-structure	tonne	63203.00
Item 5.17	Fog Spray (With OH&CP)	sqm	36.00
Item 5.21 Case-I	Crack Prevention courses. Case-I Stress Absorbing Membrane (SAM) crack width less than 6 mm (With OH&CP)	sqm	47.00
Item 5.21 Case-II	Crack Prevention courses. Case-II Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm (With OH&CP)	sqm	57.00
Item 5.21 Case-III	Crack Prevention courses. Case-III Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 % (With OH&CP)	sqm	75.00
Item 5.21 Case-IV	Crack Prevention courses. Case-IV Bitumen Impregnated Geotextile (With OH&CP)	sqm	146.00
Item 5.15 Case-I	Slurry Seal Case I, 5 mm thickness (Including OH&CP)	sqm	61.00
Item 5.15 Case-II	Slurry Seal Case II, 3 mm thickness (Including OH&CP)	sqm	43.00
Item 5.15 Case-III	Slurry Seal Case III, 1.5 mm thickness (Including OH&CP)	sqm	26.60
Item 5.9 Case-I	Surface Dressing Case I, 19 mm nominal chipping size (Including OH&CP)	sqm	64.00
Item 5.9 Case-II	Surface Dressing Case II, 13 mm nominal chipping size (Including OH&CP)	sqm	55.00

Ca



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# RAILWAY ROUTE CHART & FREIGHT

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Government of India (Bharat Sarkar )  
Ministry of Railways ( Rail Mantralaya)  
(Railway Board)

No. 2009/TT-III/S/27/1

New Delhi, dt. 6-10-2009

The General Managers (Operating)/(Commercial),  
All Indian Railways including Production Units

**GENERAL ORDER NO. 1/2009  
(RATIONALISATION SCHEME)  
(EFFECTIVE FROM 15.10.2009)**

Whereas in the opinion of the Railway Board it is necessary to do so in the public interest:

Now, therefore, in exercise of the powers conferred by Section 71 of the Railways Act, 1989 (24 of 1989) read with notification of the Government of India in the Ministry of Railways number G.S.R. 53(E) dated the 23<sup>rd</sup> January, 1995, the Railway Board hereby directs that all Railway Administration shall carry, unless it is necessary to divert such wagons for operational convenience after the consignments are booked, any goods or class of goods by such route or routes as specified in this order:

*Ca*

S.No.	From	To	Via
<b>1</b>	<b>Eastern Railway</b>		
1.1	Coal Traffic from PANEM served by Pakur	Destinations on N.R. and N.C.R.	via Pakur-Sainthia-Andal-Pradhankhunta-Mughalsarai
<b>2</b>	<b>East Coast Railway</b>		
2.1	All goods traffic	Stations reached via Cuttuck except stations on Nergundi-Cuttuck-Paradeep section	via Barang-Kapilas Road-bye pass avoiding Cuttuck
2.2	All Goods traffic loaded on ECOR, SCR and SR (except for traffic originating/terminating on the section Jakhapura - Jarauli - DPS)	To destinations for which shortest route is Jakhapura-Nayagarh-Jarauli-Baspani	via Bhadrak
<b>3</b>	<b>Northern Railway</b>		
3.1	All Goods Traffic	Destinations reached via Delhi Area or originating / terminating in Delhi Area	via Goods Avoiding Line/Delhi Avoiding Line/Tughalakabad which ever is applicable
Note: (1) Traffic for Subzi Mandi will also be routed by the direct route.			
3.2	All Goods Traffic from and via Varanasi	Lucknow and beyond	via Janghai - Pratapgarh - Rai Bareilly
3.3	Foodgrains traffic originating on Northern Railway and Jodhpur and Bikaner Divisions of North Western Railway	Station on Nagpur - Rourkela ( excl.) section including Raipur - Vizianagaram and Jharsuguda - Titlagarh sections for which the shorter route is via Anuppur - Bilaspur	Via Itarsi - Amla - Nagpur / Ajni Bye Pass.

Ln

Contd.../3/

*Signature*  
6.10.19

**4**

**North Eastern Railway**

- |     |   |  |                                      |
|-----|---|--|--------------------------------------|
| 4.1 | All goods traffic from stations of ER, ECR, SER and ECOR and vice versa | To stations on CR, WCR, NR, NCR, NWR and WR and vice versa for which the present shortest route is via MGS-BSB-MBS-ALY | via Mughalsarai - Mirzapur-Allahabad |
|-----|---|--|--------------------------------------|

**5**

**South Eastern Railway**

- |     |   |  |  |
|-----|---|--|--|
| 5.1 | Iron Ore traffic from Barsuan - Bondamunda section of S.E. Railway  | To stations for which shortest route is via Jaruli - Jakhpura and to stations on Kharagpur-Bhadrak-Jhakhpura - Vizianagaram (inclusive) section, Jhakhpura - Paradeep Port and Jhakhpura - Budhapank | Via Tatanagar - Kharagpur- Bhadrak subject to observing Para 2.1 above.  |
| 5.2 | Iron ore traffic originating at Bolanikhadan, Barbil, Barajamda, Gua, Noamundi and Dongoaposi stations and their associate sidings on South Eastern Railway | Stations on Jaruli-Jakhpura-Cuttack-Paradeep section for which the shortest route is via Banspani-Jaruli-Jakhpura  | Via Tatanagar-Kharagpur-Bhadrak  |
| 5.3 | Iron ore traffic originating at Bolanikhadan, Barbil, Barajamda, Gua and Noamundi stations and their associate sidings on South Eastern Railway             | Stations on Kapilas Road - Barang Bye pass and stations on Barang - Visakhapatnam section and via Duvada for which the shortest route is via Banspani-Jaruli-Jakhpura                                | Via Tatanagar - Kharagpur - Bhadrak subject to observing Para 2.1 above. |

**6**

**South East Central Railway**

- |     |  |                             |                         |
|-----|--|-----------------------------|-------------------------|
| 6.1 | Coal from Korea-Rewa Coal field of Bilaspur Division of SECR | Stations on Central and via | Via Katni Marwara (KMZ) |
|-----|--|-----------------------------|-------------------------|

*Amal Kumar*  
6.10.2019

*Condt...* 14/



- |     |   |   |  |
|-----|---|---|--|
| 6.2 | Coal from Korea-Rewa Coal field of Bilaspur Division of SECR  | Stations on Southern and South Central Railway and Stations of Bombay Division of Western Railway | Via Katni Marwara (KMZ)-Bina-Khandwa-Bhusaval    |
| 6.3 | All goods traffic originating on main line of Bilaspur Division {Jharsuguda (exclusive) - Durg (Inclusive) and Uslapur (exclusive)} including all branch lines connected on this section. | Stations on Vadodara & Rajkot Divisions of Western Railway  | Via Nagpur - Bhusawal - Jalgaon - Surat.         |
| 6.4 | All Goods Traffic originating from Bhilai Steel Plant and Durg  | Stations on Southern Railway  | via Nagpur- Balharshah instead of via R.V. line. |

7. The provisions of the Rationalisation Scheme shall not apply to Over Dimensional Consignments, POL traffic and edible salt i.e. salt for human consumption.

8. The rate to be charged will be those chargeable by the route specified above.

9. The provisions of the Rationalisation Scheme will also apply to the branch lines connected with the different sections covered by the Rationalisation Scheme General Order unless categorically specified otherwise.

10. This order is issued in suppression of General Order No. 1/2008 issued under Board's letter No. 2008/TT-III/27/1 dated 11.06.2008 and will come into force with effect from 15.10.2009 and unless cancelled earlier will remain in force up to 31.10.2010.

Please acknowledge receipt.

DA: 25 spares

  
 (Sarat Kumar)  
 Joint Director Traffic Transp.  
 Railway Board

Cn

Contd..../5/..



No. 2009/TT-III(S)/27/1

New Delhi, dt: 6-10-09

Copy forwarded for information and necessary action to:

1. The Joint Director (Rail Movement), Eastern Railway House, Fairlie Place, 17, N.S. Road, Kolkata.
2. The FA&CAOs, All Indian Railways.
3. ADAI (Railways) with 10 copies spare, 2<sup>nd</sup> floor, Rail Bhawan, New Delhi.
4. The Principal, Railway Staff College, Vadodara.
5. Managing Director, Centre for Railway Information System (CRIS), Chanakya Puri, New Delhi.
6. The CAO, FOIS C/o CRIS, Chanakyapuri, New Delhi.
7. The Managing Director, Container Corporation of India Ltd. (CONCOR), CONCOR Bhavan, C-3 Mathura Road, Opposite Apollo Hospital, New Delhi 110076
8. Managing Director, Konkan Railway Corporation Limited, Belapur Bhavan, Plot No.6, Sector 11, CBD, Belapur, Navi Mumbai 400614.
9. The Cabinet Secretariat, Rashtrapati Bhawan, New Delhi.
10. The Planning Commission, Yojna Bhawan, New Delhi.
11. All Ministries of Government of India.
12. The Chief Secretaries, All State Governments.
13. The Salt Commissioner, 2-A Lawan Bhawan, Lawan Marg, Jhalana Dhungari, Post Box No. 139, Jaipur - 302 004.
14. The Dy. Director General, Railway Movement, Army Headquarters, QMG's Branch, DHQ P.O. Sena Bhawan, New Delhi.
15. The Director, Indian Bureau of Mines, Nagpur.
16. The Traffic Manager, Kolkata Port Trust Railway, Kolkata.
17. The Manager, Madras Port Trust Railway, Chennai
18. The Manager, Bombay Port Trust Railway, Mumbai
19. The Chief Traffic Manager, FCI, 16-20 Barakhamba Lane, New Delhi.
20. The Dy. Traffic Manager (Movement) Rates, FCI, 16-20 Barakhamba Lane, New Delhi.
21. The Coal Controller, 1 Council House Street, Kolkata.
22. The State Trading Corporation of India, Chandralok, 30<sup>th</sup> Janpath, New Delhi.
23. The Chairman, Paradeep Port Trust, Paradip Port, Orissa 754142
24. The Chairman, Tuticorin Port Trust, Tuticorin, 628004.
25. The Chairman, Cochin Port Trust, Willington Island, cochin 682009.
26. The Chairman, Chennai Port Trust, Chennai 600001.
27. The Chairman, Kandala Port Trust, P.O.Box. No.50, Administrative Building, Gandhidham, Kutch, 370201.

(Sanat Kumar)

Joint Director Traffic Trans.  
Railway Board-

EDTT(M), EDTT(S), EDTT(F), EDFM, EDPM, EDFC, ED(C&IS), EDV (T), EDP, ED(T&C), ED (LRDSS), E.D.A. DTT(G), DTT(COORD), DF(C), DTC (G), DPM, Dir(T&C), DFM, DFA, DF(CCA), DTC (R), Dir(FM), JDTT(POL) CHG/CONTROL,DDTC(CR), DTT(F), DDTT(V), DDTT-III(M), DDTT-III(NB),DDTT-I, DDTC(R),TT-I, TT-II, TT-IV, TT-V, FC, TC (CR), TC-I, TC-II, TC-III, TC-IV, TC (FM), Branches of Railway Board.

**GOVERNMENT OF INDIA (भारत सरकार)**  
**MINISTRY OF RAILWAYS (रेल मंत्रालय)**  
**RAILWAY BOARD (रेलवे बोर्ड)**

TCR/1078/2018/15

New Delhi , Dt. 31/10/ 2018

**General Manager,**  
All Indian Railways.

**Sub: Adjustment in Base Freight rates effective from 01 / 11 / 2018.**

1. Sanction of the Central Government is hereby accorded to rationalise the freight rates. A copy of revised freight tables is enclosed as Annexure-I.
2. The sanction of the Central Government is also accorded for the following:
  - 2.1 There shall be no increase in Base Freight of Main commodity heads Cements, 'Foodgrains, Flours and Pulses', Chemical Manures, Salts, Sugar, 'Hydrogenated and other Edible Oils' and Petroleum Products (POL) under Commodity Group No.18 as mentioned in IRCA Goods Tariff No. 48 part-I (Vol-II). Freight table of these commodities/groups is given at Annexure-II. Accordingly the classification of these commodities has been revised as under:-

S. No	Commodity	Commodity Group No. as mentioned in IRCA Goods Tariff No. 48 part-I (Vol-II)	Revised Class	
			Trainload	Wagonload
1.	Cement	5(a)	140A	140B
		5(b) - (Fly Ash)	120A	120B
2.	Chemical Manures	6	130A	130B
3.	Foodgrains, Flours & Pulses	9	130A	130B
4.	Hydrogenated and other Edible Oils	11(a)	140A	140B
		11(b) -(in covered wagons)	LR-3(A)	LR-3(B)
5.	POL (Petroleum Products)	18(a)	180A	180B
6.	Salts	19(a)	100A	100B
7.	Sugar	21	120A	120B

- 2.2 The revised freight rate table for main commodity head 'Coal and Coke' is given at Annexure-III. No Busy Season Surcharge and Development charge shall be leviable on transportation of Coal and Coke.
- 2.3 As a special case, Salt traffic (under the commodity group no. 19(a) in the IRCA Goods Tariff No.48 part-I Vol. II), when booked under TEFD will also be charged at class 100A(trainload) instead of class LR1 as stipulated in Rates Circular no.16 of 2018.
3. A copy of revised Goods tariff no. 48, part-II (freight rates tables) is enclosed herewith.
4. Zonal Railway shall ensure that requisite number of copies of the revised Goods Tariff No. 48 part-II (Freight Rates Tables) are collected from General Secretary, IRCA and distributed in time.
5. Steps should also be taken to ensure that all relevant personnel are made conversant with the aforesaid revisions, related instructions, etc. promptly. Commercial Inspectors (CMIs) and Traffic Inspectors of Accounts (TIAs) may be deputed to goods sheds / stations/ sidings etc. for ensuring correct implementation of the instructions particularly during the initial phase.

The issues with the concurrence of Finance Directorate of the Ministry of Railways.

DA: As above

  
(Barjesh Dharmani)  
Executive Director, Traffic Commercial (Rates)  
Railway Board

No. TCR/1078/2018/15

New Delhi, dated: 31/10/2018

**Copy for information:-**

**Principal Finance Adviser, All Zonal Railways**  
**Dy.C&AG (Rlys), Room No. 222, Rail Bhawan, New Delhi**

  
for Finance Commissioner, Railways

No. TCR/1078/2018/15

New Delhi, dated: 31/10/2018

**Copy to:-**

1. Principal Chief Commercial Manager, All Zonal Railways
2. Principal Chief Operations Manager, All Zonal Railways
3. Managing Director, CRIS, Chanakyapuri, New Delhi-21.
4. MD, KRCL, Belapur Bhavan, Sector-11, CBD Belapur, Navi Mumbai-400614.
5. Director General, National Academy of Indian Railways, Vadodara.
6. General Secy., IRCA, New Delhi.



**Rates Circular No. 19 of 2018**

7. Director, IRITM, Campus: Hardoi Bye Pass Road, Village & Post office, Kanausi, Manaknagar, Lucknow-226011
8. Managing Director, Pipavav Railway Corporation Ltd., Jeevan Tara Building, 1<sup>st</sup> Floor, Gate No.4, Sansad Marg, New Delhi-110001
9. Chief Commissioner of Railway Safety, Lucknow.



**(Barjesh Dharmani)**  
**Executive Director, Traffic Commercial (Rates)**  
**Railway Board**

**Copy to:-**

**CRB, MT, FC, Railway Board**

AM(C), AM(T), AM(IT) PED(F), PED(TT/M), PED(Vig.), PED(Acct.), EDTC(R), EDPG, ED(C&IS), EDFM, EDTT(S), EDTT(F), ED(Coal), EDFC, EDVT, ED(Coord)/MOS(G), DFM, DFC, DPG, DTT(G), DF(CCA) Railway Board

TC(R), TC(CR), F(C), TC(FM), Safety branches, Railway Board.

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## FREIGHT RATE PER TONNE

Distance (kilometres)	वर्ग Class LR3	वर्ग Class LR2	वर्ग Class LR1	वर्ग Class 100	वर्ग Class 110	वर्ग Class 120	वर्ग Class 130	वर्ग Class 140
1 - 100	86.30	98.60	117.20	123.30	135.70	148.10	160.30	172.70
101 - 125	107.80	123.30	146.40	154.20	169.60	185.10	200.40	215.80
126 - 150	125.20	143.30	178.60	188.00	206.80	225.60	244.40	263.20
151 - 175	140.60	160.60	200.20	210.70	231.80	252.90	273.90	295.00
176 - 200	157.00	179.50	223.90	235.60	259.20	282.70	306.30	329.90
201 - 225	172.40	197.10	245.70	258.70	284.60	310.40	336.30	362.20
226 - 250	189.00	216.00	269.30	283.50	311.90	340.10	368.50	396.90
251 - 275	205.50	234.80	292.80	308.30	339.10	369.90	400.80	431.60
276 - 300	221.90	253.50	316.10	332.70	366.00	399.30	432.60	465.90
301 - 325	237.10	271.10	338.10	355.90	391.50	427.10	462.70	498.30
326 - 350	253.20	289.30	360.90	379.90	417.90	455.90	493.90	532.00
351 - 375	269.20	307.70	383.70	404.00	444.40	484.80	525.20	565.60
376 - 400	285.70	326.50	407.00	428.40	471.30	514.10	557.00	599.80
401 - 425	302.20	345.20	430.50	453.10	498.50	543.70	589.10	634.40
426 - 450	318.40	363.80	453.70	477.60	525.30	573.10	620.90	668.70
451 - 475	334.50	382.20	476.50	501.60	551.80	602.00	652.10	702.30
476 - 500	351.20	401.40	500.40	526.80	579.40	632.10	684.80	737.50
501 - 550	384.20	439.20	547.60	576.50	634.10	691.70	749.40	807.00
551 - 600	417.10	476.70	594.40	625.70	688.30	750.90	813.40	876.10
601 - 650	449.60	513.90	640.80	674.60	742.00	809.50	877.00	944.40
651 - 700	482.10	551.00	687.00	723.20	795.40	867.80	940.10	1012.50
701 - 750	514.70	588.30	733.60	772.20	849.40	926.70	1003.90	1081.10
751 - 800	546.70	624.80	779.30	820.30	902.30	984.40	1066.40	1148.40
801 - 850	579.00	661.60	825.00	868.50	955.40	1042.10	1129.00	1215.80
851 - 900	611.00	698.20	870.60	916.40	1008.10	1099.70	1191.40	1283.00
901 - 950	642.80	734.70	916.10	964.30	1060.70	1157.10	1253.60	1350.00
951 - 1000	674.80	771.20	961.60	1012.10	1113.40	1214.50	1315.80	1417.00
1001 - 1100	739.20	844.90	1053.40	1108.80	1219.70	1330.60	1441.50	1552.30
1101 - 1200	803.90	918.70	1145.50	1205.70	1326.30	1446.80	1567.40	1688.00
1201 - 1300	868.10	992.10	1237.00	1302.20	1432.30	1562.60	1692.80	1823.10
1301 - 1400	932.10	1065.30	1328.20	1398.10	1537.80	1677.70	1817.50	1957.30
1401 - 1500	996.00	1138.30	1419.30	1494.00	1643.40	1792.80	1942.20	2091.60
1501 - 1625	1058.20	1209.20	1507.70	1587.10	1745.70	1904.50	2063.20	2221.90
1626 - 1750	1139.60	1302.30	1623.70	1709.20	1880.10	2051.00	2222.00	2392.90
1751 - 1875	1171.80	1339.20	1669.70	1757.60	1933.40	2109.10	2284.90	2460.60
1876 - 2000	1249.90	1428.40	1781.00	1874.70	2062.20	2249.70	2437.10	2624.60
2001 - 2125	1262.40	1442.80	1798.90	1893.60	2083.00	2272.40	2461.70	2651.00
2126 - 2250	1336.60	1527.60	1904.70	2005.00	2205.50	2406.00	2606.50	2807.00
2251 - 2375	1348.90	1541.50	1922.00	2023.10	2225.40	2427.80	2630.00	2832.50
2376 - 2500	1419.80	1622.50	2023.10	2129.60	2342.60	2555.70	2768.50	2981.40
2501 - 2625	1441.90	1648.10	2054.90	2163.10	2379.40	2595.70	2812.00	3028.30
2626 - 2750	1510.60	1726.50	2152.80	2266.10	2492.70	2719.30	2945.90	3172.50
2751 - 2875	1532.20	1751.10	2183.20	2298.20	2528.00	2757.80	2987.70	3217.50
2876 - 3000	1598.80	1827.10	2278.20	2398.10	2637.90	2877.70	3117.60	3357.30
3001 - 3125	1619.40	1850.60	2307.50	2429.00	2671.90	2914.80	3157.70	3400.60
3126 - 3250	1684.10	1924.60	2400.00	2526.20	2778.80	3031.40	3284.10	3536.70
3251 - 3375	1704.30	1947.70	2428.70	2556.40	2812.20	3067.70	3323.30	3579.00
3376 - 3500	1767.50	2019.90	2518.50	2651.10	2916.20	3181.30	3446.40	3711.50

18/10/15

## FREIGHT RATE PER TONNE

Distance (kilometres)	वर्ग Class 145	वर्ग Class 150	वर्ग Class 160	वर्ग Class 165	वर्ग Class 170	वर्ग Class 180	वर्ग Class 190	वर्ग Class 200
1 - 100	178.90	185.10	197.30	203.50	209.70	222.00	234.30	246.70
101 - 125	223.60	231.30	246.70	254.40	262.20	277.50	292.90	308.40
126 - 150	272.60	282.10	300.80	310.20	319.60	338.40	357.20	376.00
151 - 175	305.60	316.10	337.20	347.70	358.30	379.30	400.40	421.50
176 - 200	341.70	353.50	377.00	388.90	400.60	424.20	447.70	471.30
201 - 225	375.20	388.10	413.90	426.80	439.80	465.60	491.50	517.40
226 - 250	411.00	425.30	453.60	467.80	482.00	510.30	538.60	567.00
251 - 275	447.00	462.50	493.30	508.70	524.10	554.90	585.80	616.60
276 - 300	482.50	499.10	532.40	549.10	565.70	599.00	632.30	665.50
301 - 325	516.10	533.90	569.50	587.20	605.10	640.60	676.30	711.90
326 - 350	550.90	569.90	607.90	626.90	645.90	683.90	722.00	759.90
351 - 375	585.80	606.00	646.40	666.60	686.80	727.20	767.70	808.00
376 - 400	621.30	642.70	685.50	706.90	728.40	771.20	814.10	856.90
401 - 425	657.00	679.80	725.00	747.70	770.30	815.70	861.00	906.30
426 - 450	692.50	716.40	764.20	788.10	811.90	859.70	907.50	955.30
451 - 475	727.40	752.50	802.60	827.70	852.70	902.90	953.20	1003.30
476 - 500	763.80	790.20	842.80	869.20	895.50	948.20	1000.90	1053.60
501 - 550	835.80	864.80	922.40	951.20	980.10	1037.70	1095.30	1153.00
551 - 600	907.30	938.60	1001.10	1032.50	1063.80	1126.30	1189.00	1251.50
601 - 650	978.10	1011.90	1079.30	1113.10	1146.80	1214.20	1281.70	1349.10
651 - 700	1048.70	1084.80	1157.10	1193.30	1229.40	1301.70	1374.00	1446.40
701 - 750	1119.70	1158.40	1235.60	1274.20	1312.80	1390.00	1467.20	1544.40
751 - 800	1189.40	1230.50	1312.50	1353.50	1394.50	1476.50	1558.60	1640.60
801 - 850	1259.30	1302.70	1389.60	1433.00	1476.40	1563.30	1650.10	1737.00
851 - 900	1328.80	1374.70	1466.30	1512.10	1557.90	1649.60	1741.20	1832.80
901 - 950	1398.20	1446.50	1542.90	1591.10	1639.30	1735.70	1832.10	1928.50
951 - 1000	1467.60	1518.20	1619.40	1670.00	1720.60	1821.90	1923.00	2024.20
1001 - 1100	1607.80	1663.20	1774.10	1829.50	1885.00	1995.80	2106.70	2217.60
1101 - 1200	1748.30	1808.60	1929.10	1989.40	2049.70	2170.30	2290.80	2411.40
1201 - 1300	1888.20	1953.30	2083.50	2148.60	2213.70	2343.90	2474.10	2604.40
1301 - 1400	2027.20	2097.20	2237.00	2306.90	2376.80	2516.60	2656.30	2796.20
1401 - 1500	2166.30	2241.00	2390.40	2465.10	2539.80	2689.20	2838.60	2988.00
1501 - 1625	2301.30	2380.70	2539.40	2618.70	2698.10	2856.80	3015.40	3174.30
1626 - 1750	2478.30	2563.80	2734.70	2820.20	2905.60	3076.60	3247.50	3418.40
1751 - 1875	2548.50	2636.50	2812.20	2900.00	2987.90	3163.70	3339.40	3515.20
1876 - 2000	2718.30	2812.10	2999.50	3093.30	3187.00	3374.50	3561.90	3749.40
2001 - 2125	2745.80	2840.60	3029.80	3124.40	3219.10	3408.50	3597.90	3787.20
2126 - 2250	2907.30	3007.50	3208.00	3308.30	3408.50	3609.00	3809.50	4010.00
2251 - 2375	2933.60	3034.70	3237.00	3338.40	3439.30	3641.60	3844.00	4046.20
2376 - 2500	3087.90	3194.40	3407.40	3513.80	3620.30	3833.30	4046.20	4259.20
2501 - 2625	3136.50	3244.70	3461.00	3569.10	3677.30	3893.60	4109.90	4326.20
2626 - 2750	3285.80	3399.20	3625.80	3739.10	3852.40	4079.00	4305.60	4532.20
2751 - 2875	3332.40	3447.30	3677.10	3792.00	3906.90	4136.80	4366.60	4596.40
2876 - 3000	3477.20	3597.20	3837.00	3956.90	4076.80	4316.60	4556.40	4796.20
3001 - 3125	3522.10	3643.50	3886.40	4007.90	4129.30	4372.20	4615.10	4858.00
3126 - 3250	3663.00	3789.30	4041.90	4168.20	4294.50	4547.20	4799.80	5052.40
3251 - 3375	3706.80	3834.60	4090.50	4218.10	4345.90	4601.50	4857.20	5112.80
3376 - 3500	3844.10	3976.70	4241.80	4374.30	4506.90	4772.00	5037.10	5302.20

## FREIGHT RATE PER TONNE (in ₹)

Distance Slab (in Kms)	Class LR-3 (A)		Class 100A		Class 120A	
	Class-(LR3) A	Class-(LR3)B	Class-100A	Class-100B	Class-120 A	Class-120B
	Trainload	Wagonload	Trainload	Wagonload	Trainload	Wagonload
1 - 100	79.40	136.20	113.40	170.20	136.20	170.20
101 - 125	99.20	170.20	141.80	212.70	170.20	212.70
126 - 150	115.20	207.50	172.90	259.40	207.50	259.40
151 - 175	129.30	232.60	193.80	290.70	232.60	290.70
176 - 200	144.40	260.00	216.70	325.10	260.00	325.10
201 - 225	158.60	285.50	237.90	356.90	285.50	356.90
226 - 250	173.80	312.80	260.70	391.10	312.80	391.10
251 - 275	189.00	340.20	283.50	425.30	340.20	425.30
276 - 300	204.10	367.20	306.00	459.00	367.20	459.00
301 - 325	218.10	392.80	327.30	491.00	392.80	491.00
326 - 350	232.90	419.30	349.40	524.10	419.30	524.10
351 - 375	247.60	445.80	371.50	557.30	445.80	557.30
376 - 400	262.80	472.80	394.00	591.00	472.80	591.00
401 - 425	277.90	500.00	416.70	625.10	500.00	625.10
426 - 450	292.80	527.00	439.20	658.80	527.00	658.80
451 - 475	307.60	553.60	461.30	692.00	553.60	692.00
476 - 500	323.00	581.30	484.40	726.60	581.30	726.60
501 - 550	353.30	636.10	530.10	795.20	636.10	795.20
551 - 600	383.60	690.50	575.40	863.10	690.50	863.10
601 - 650	413.50	744.40	620.30	930.50	744.40	930.50
651 - 700	443.40	798.00	665.00	997.50	798.00	997.50
701 - 750	473.30	852.10	710.10	1065.20	852.10	1065.20
751 - 800	502.80	905.20	754.30	1131.50	905.20	1131.50
801 - 850	532.40	958.30	798.60	1197.90	958.30	1197.90
851 - 900	561.90	1011.20	842.70	1264.10	1011.20	1264.10
901 - 950	591.10	1064.00	886.70	1330.10	1064.00	1330.10
951 - 1000	620.50	1116.80	930.70	1396.10	1116.80	1396.10
1001 - 1100	679.70	1223.50	1019.60	1529.40	1223.50	1529.40
1101 - 1200	739.20	1330.40	1108.70	1663.10	1330.40	1663.10
1201 - 1300	798.30	1436.90	1197.40	1796.10	1436.90	1796.10
1301 - 1400	857.10	1542.70	1285.60	1928.40	1542.70	1928.40
1401 - 1500	915.90	1648.60	1373.80	2060.70	1648.60	2060.70
1501 - 1625	973.10	1751.30	1459.40	2189.10	1751.30	2189.10
1626 - 1750	1047.90	1886.00	1571.70	2357.60	1886.00	2357.60
1751 - 1875	1077.50	1939.40	1616.20	2424.30	1939.40	2424.30
1876 - 2000	1149.30	2068.70	1723.90	2585.90	2068.70	2585.90
2001 - 2125	1160.80	2089.60	1741.30	2612.00	2089.60	2612.00
2126 - 2250	1229.10	2212.40	1843.70	2765.60	2212.40	2765.60
2251 - 2375	1240.40	2232.50	1860.40	2790.60	2232.50	2790.60
2376 - 2500	1305.60	2350.00	1958.30	2937.50	2350.00	2937.50
2501 - 2625	1325.90	2386.90	1989.10	2983.70	2386.90	2983.70
2626 - 2750	1389.10	2500.60	2083.80	3125.70	2500.60	3125.70
2751 - 2875	1408.90	2536.00	2113.30	3170.00	2536.00	3170.00
2876 - 3000	1470.20	2646.20	2205.20	3307.80	2646.20	3307.80
3001 - 3125	1489.10	2680.30	2233.60	3350.40	2680.30	3350.40
3126 - 3250	1548.60	2787.60	2323.00	3484.50	2787.60	3484.50
3251 - 3375	1567.20	2821.00	2350.80	3526.20	2821.00	3526.20
3376 - 3500	1625.30	2925.40	2437.80	3656.70	2925.40	3656.70



**Rates Circular No. 19 of 2018**

**Annexure-II**

**FREIGHT RATE PER TONNE (in ₹)**

Distance Slab (in Kms)	Class 130A		Class 140A		Class 180A	
	Class-130A	Class-130B	Class-140A	Class-140B	Class-180A	Class-180B
	Trainload	Wagonload	Trainload	Wagonload	Trainload	Wagonload
1 - 100	147.40	170.20	158.80	170.20	204.20	215.50
101 - 125	184.30	212.70	198.50	212.70	255.20	269.40
126 - 150	224.80	259.40	242.10	259.40	311.20	328.50
151 - 175	251.90	290.70	271.30	290.70	348.80	368.20
176 - 200	281.70	325.10	303.40	325.10	390.10	411.70
201 - 225	309.30	356.90	333.10	356.90	428.20	452.00
226 - 250	338.90	391.10	365.00	391.10	469.30	495.30
251 - 275	368.60	425.30	396.90	425.30	510.30	538.70
276 - 300	397.80	459.00	428.40	459.00	550.80	581.40
301 - 325	425.50	491.00	458.20	491.00	589.10	621.90
326 - 350	454.20	524.10	489.20	524.10	628.90	663.90
351 - 375	483.00	557.30	520.10	557.30	668.70	705.90
376 - 400	512.20	591.00	551.60	591.00	709.20	748.60
401 - 425	541.70	625.10	583.40	625.10	750.10	791.70
426 - 450	571.00	658.80	614.90	658.80	790.60	834.50
451 - 475	599.70	692.00	645.80	692.00	830.30	876.50
476 - 500	629.70	726.60	678.20	726.60	871.90	920.40
501 - 550	689.10	795.20	742.10	795.20	954.20	1007.20
551 - 600	748.00	863.10	805.60	863.10	1035.70	1093.30
601 - 650	806.40	930.50	868.40	930.50	1116.50	1178.60
651 - 700	864.50	997.50	931.00	997.50	1197.00	1263.50
701 - 750	923.10	1065.20	994.10	1065.20	1278.20	1349.20
751 - 800	980.60	1131.50	1056.00	1131.50	1357.70	1433.20
801 - 850	1038.20	1197.90	1118.00	1197.90	1437.50	1517.30
851 - 900	1095.50	1264.10	1179.80	1264.10	1516.90	1601.10
901 - 950	1152.70	1330.10	1241.40	1330.10	1596.10	1684.70
951 - 1000	1209.90	1396.10	1303.00	1396.10	1675.30	1768.30
1001 - 1100	1325.50	1529.40	1427.40	1529.40	1835.30	1937.20
1101 - 1200	1441.30	1663.10	1552.20	1663.10	1995.70	2106.50
1201 - 1300	1556.60	1796.10	1676.40	1796.10	2155.30	2275.10
1301 - 1400	1671.30	1928.40	1799.80	1928.40	2314.10	2442.60
1401 - 1500	1785.90	2060.70	1923.30	2060.70	2472.80	2610.20
1501 - 1625	1897.20	2189.10	2043.20	2189.10	2626.90	2772.90
1626 - 1750	2043.20	2357.60	2200.40	2357.60	2829.10	2986.20
1751 - 1875	2101.10	2424.30	2262.70	2424.30	2909.20	3070.80
1876 - 2000	2241.10	2585.90	2413.50	2585.90	3103.00	3275.40
2001 - 2125	2263.70	2612.00	2437.80	2612.00	3134.30	3308.50
2126 - 2250	2396.80	2765.60	2581.20	2765.60	3318.70	3503.00
2251 - 2375	2418.50	2790.60	2604.60	2790.60	3348.70	3534.80
2376 - 2500	2545.80	2937.50	2741.60	2937.50	3524.90	3720.80
2501 - 2625	2585.80	2983.70	2784.70	2983.70	3580.40	3779.30
2626 - 2750	2708.90	3125.70	2917.30	3125.70	3750.80	3959.20
2751 - 2875	2747.30	3170.00	2958.60	3170.00	3803.90	4015.30
2876 - 3000	2866.80	3307.80	3087.30	3307.80	3969.40	4189.90
3001 - 3125	2903.70	3350.40	3127.00	3350.40	4020.50	4243.80
3126 - 3250	3019.90	3484.50	3252.20	3484.50	4181.40	4413.70
3251 - 3375	3056.00	3526.20	3291.10	3526.20	4231.40	4466.50
3376 - 3500	3169.10	3656.70	3412.90	3656.70	4388.00	4631.80



**Commodity - Coal & Coke**

**Freight Rate Table**

Distance Slab (in Kms)			Class-145A	Class-145B
			Trainload	Wagonload
1	-	100	216.00	226.80
101	-	125	389.60	409.10
126	-	150	448.90	471.30
151	-	175	488.70	513.10
176	-	200	532.20	559.00
201	-	275	672.50	706.10
276	-	350	797.20	837.10
351	-	425	926.00	972.30
426	-	500	1054.70	1107.40
501	-	600	1228.00	1289.40
601	-	700	1398.70	1468.70
701	-	730	1435.60	1507.40
731	-	760	1484.00	1558.30
761	-	790	1537.90	1614.80
791	-	820	1586.70	1665.90
821	-	850	1640.30	1722.40
851	-	880	1688.60	1773.00
881	-	910	1737.00	1823.70
911	-	940	1790.20	1879.90
941	-	970	1838.60	1930.50
971	-	1000	1891.80	1986.30
1001	-	1020	1919.90	2015.90
1021	-	1040	1955.20	2052.90
1041	-	1060	1990.50	2090.00
1061	-	1080	2025.70	2126.90
1081	-	1100	2061.00	2164.10
1101	-	1120	2090.00	2194.50
1121	-	1140	2125.10	2231.30
1141	-	1160	2160.30	2268.40
1161	-	1180	2195.60	2305.30
1181	-	1200	2230.70	2342.10
1201	-	1220	2259.40	2372.30
1221	-	1240	2294.40	2409.10
1241	-	1260	2329.40	2445.90
1261	-	1280	2364.60	2482.70
1281	-	1300	2399.60	2519.60
1301	-	1320	2427.70	2549.00
1321	-	1340	2462.60	2585.70
1341	-	1360	2497.60	2622.40
1361	-	1380	2532.60	2659.20
1381	-	1400	2567.60	2695.90
1401	-	1420	2596.10	2725.80
1421	-	1440	2630.90	2762.40
1441	-	1460	2665.80	2799.00
1461	-	1480	2680.90	2814.90
1481	-	1500	2695.00	2829.80

Distance Slab (in Kms)			Class-145A	Class-145B
			Trainload	Wagonload
1501	-	1510	2706.70	2842.10
1511	-	1520	2719.00	2854.90
1521	-	1530	2726.10	2862.50
1531	-	1540	2733.40	2870.10
1541	-	1550	2740.60	2877.70
1551	-	1560	2747.80	2885.10
1561	-	1570	2755.10	2892.90
1571	-	1580	2762.30	2900.50
1581	-	1590	2769.50	2908.10
1591	-	1600	2776.70	2915.50
1601	-	1610	2783.90	2923.10
1611	-	1620	2791.20	2930.70
1621	-	1630	2798.40	2938.40
1631	-	1640	2805.60	2945.80
1641	-	1650	2812.80	2953.40
1651	-	1660	2820.10	2961.00
1661	-	1670	2827.30	2968.70
1671	-	1680	2834.50	2976.20
1681	-	1690	2841.70	2983.80
1691	-	1700	2848.90	2991.40
1701	-	1710	2856.20	2999.00
1711	-	1720	2863.40	3006.50
1721	-	1730	2870.60	3014.10
1731	-	1740	2877.90	3021.70
1741	-	1750	2885.00	3029.30
1751	-	1760	2892.30	3036.80
1761	-	1770	2899.50	3044.50
1771	-	1780	2906.80	3052.10
1781	-	1790	2914.00	3059.70
1791	-	1800	2921.10	3067.20
1801	-	1810	2928.40	3074.80
1811	-	1820	2935.60	3082.40
1821	-	1830	2942.90	3090.00
1831	-	1840	2950.10	3097.50
1841	-	1850	2957.20	3105.10
1851	-	1860	2964.50	3112.80
1861	-	1870	2971.70	3120.40
1871	-	1880	2979.00	3127.90
1881	-	1890	2986.20	3135.50
1891	-	1900	2993.30	3143.10
1901	-	1910	3000.60	3150.70
1911	-	1920	3007.80	3158.20
1921	-	1930	3015.10	3165.80
1931	-	1940	3022.30	3173.40
1941	-	1950	3029.60	3181.00
1951	-	1960	3036.70	3188.60

## Commodity - Coal &amp; Coke

## Freight Rate Table

Distance Slab (in Kms)			Class-145A Trainload	Class-145B Wagonload
1961	-	1970	3043.90	3196.20
1971	-	1980	3051.20	3203.80
1981	-	1990	3058.40	3211.40
1991	-	2000	3065.70	3218.90
2001	-	2010	3072.80	3226.50
2011	-	2020	3080.00	3234.10
2021	-	2030	3087.30	3241.70
2031	-	2040	3094.50	3249.20
2041	-	2050	3101.80	3256.80
2051	-	2060	3108.90	3264.50
2061	-	2070	3116.10	3272.10
2071	-	2080	3123.40	3279.60
2081	-	2090	3130.60	3287.20
2091	-	2100	3137.90	3294.80
2101	-	2110	3145.10	3302.40
2111	-	2120	3152.30	3309.90
2121	-	2130	3159.50	3317.50
2131	-	2140	3166.70	3325.10
2141	-	2150	3174.00	3332.80
2151	-	2160	3181.20	3340.10
2161	-	2170	3188.40	3347.90
2171	-	2180	3195.60	3355.50
2181	-	2190	3202.80	3363.10
2191	-	2200	3210.10	3370.50
2201	-	2210	3217.30	3378.10
2211	-	2220	3224.50	3385.70
2221	-	2230	3231.70	3393.40
2231	-	2240	3238.90	3400.80
2241	-	2250	3246.20	3408.40
2251	-	2260	3253.40	3416.10
2261	-	2270	3260.70	3423.70
2271	-	2280	3267.80	3431.20
2281	-	2290	3275.10	3438.80
2291	-	2300	3282.30	3446.40
2301	-	2310	3289.50	3454.00
2311	-	2320	3296.80	3461.50
2321	-	2330	3303.90	3469.10
2331	-	2340	3311.20	3476.70
2341	-	2350	3318.40	3484.40
2351	-	2360	3325.60	3491.90
2361	-	2370	3332.90	3499.50
2371	-	2380	3340.00	3507.10
2381	-	2390	3347.30	3514.70
2391	-	2400	3354.50	3522.20

Distance Slab (in Kms)			Class-145A Trainload	Class-145B Wagonload
2401	-	2410	3361.70	3529.80
2411	-	2420	3369.00	3537.40
2421	-	2430	3376.10	3545.00
2431	-	2440	3383.40	3552.50
2441	-	2450	3390.60	3560.10
2451	-	2460	3397.90	3567.80
2461	-	2470	3405.10	3575.40
2471	-	2480	3412.20	3582.90
2481	-	2490	3419.50	3590.50
2491	-	2500	3426.70	3598.10
2501	-	2510	3434.00	3605.70
2511	-	2520	3441.20	3613.20
2521	-	2530	3448.40	3620.80
2531	-	2540	3455.60	3628.40
2541	-	2550	3462.80	3636.10
2551	-	2560	3470.10	3643.60
2561	-	2570	3477.30	3651.20
2571	-	2580	3484.60	3658.80
2581	-	2590	3491.70	3666.40
2591	-	2600	3498.90	3673.90
2601	-	2610	3506.20	3681.50
2611	-	2620	3513.40	3689.10
2621	-	2630	3520.70	3696.70
2631	-	2640	3527.90	3704.20
2641	-	2650	3535.00	3711.90
2651	-	2660	3542.30	3719.50
2661	-	2670	3549.50	3727.10
2671	-	2680	3556.80	3734.60
2681	-	2690	3564.00	3742.20
2691	-	2700	3571.10	3749.80
2701	-	2710	3578.40	3757.40
2711	-	2720	3585.60	3764.90
2721	-	2730	3592.90	3772.50
2731	-	2740	3600.10	3780.20
2741	-	2750	3607.30	3787.80
2751	-	2760	3614.50	3795.20
2761	-	2770	3621.70	3802.80
2771	-	2780	3629.00	3810.50
2781	-	2790	3636.20	3818.10
2791	-	2800	3643.50	3825.50
2801	-	2810	3650.60	3833.10
2811	-	2820	3657.80	3840.70
2821	-	2830	3665.10	3848.30
2831	-	2840	3672.30	3855.80

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## Commodity - Coal &amp; Coke

## Freight Rate Table

Distance Slab (in Kms)			Class-145A	Class-145B
			Trainload	Wagonload
2841	-	2850	3679.60	3863.50
2851	-	2860	3686.70	3871.10
2861	-	2870	3693.90	3878.70
2871	-	2880	3701.20	3886.20
2881	-	2890	3708.40	3893.80
2891	-	2900	3715.70	3901.40
2901	-	2910	3722.80	3909.00
2911	-	2920	3730.10	3916.50
2921	-	2930	3737.30	3924.10
2931	-	2940	3744.50	3931.70
2941	-	2950	3751.80	3939.40
2951	-	2960	3758.90	3946.90
2961	-	2970	3766.20	3954.50
2971	-	2980	3773.40	3962.10
2981	-	2990	3780.60	3969.70
2991	-	3000	3787.90	3977.20
3001	-	3010	3795.00	3984.80
3011	-	3020	3802.30	3992.40
3021	-	3030	3809.50	4000.00
3031	-	3040	3816.70	4007.50
3041	-	3050	3824.00	4015.20
3051	-	3060	3831.20	4022.80
3061	-	3070	3838.40	4030.40
3071	-	3080	3845.60	4037.90
3081	-	3090	3852.90	4045.50
3091	-	3100	3860.10	4053.10
3101	-	3110	3867.30	4060.70
3111	-	3120	3874.50	4068.20
3121	-	3130	3881.70	4075.80
3131	-	3140	3889.00	4083.50
3141	-	3150	3896.20	4091.10
3151	-	3160	3903.40	4098.60
3161	-	3170	3910.70	4106.20

Distance Slab (in Kms)			Class-145A	Class-145B
			Trainload	Wagonload
3171	-	3180	3917.80	4113.80
3181	-	3190	3925.10	4121.40
3191	-	3200	3932.30	4128.90
3201	-	3210	3939.50	4136.50
3211	-	3220	3946.80	4144.10
3221	-	3230	3953.90	4151.70
3231	-	3240	3961.20	4159.30
3241	-	3250	3968.40	4166.90
3251	-	3260	3975.70	4174.50
3261	-	3270	3982.90	4182.10
3271	-	3280	3990.00	4189.60
3281	-	3290	3997.30	4197.20
3291	-	3300	4004.50	4204.80
3301	-	3310	4011.80	4212.40
3311	-	3320	4019.00	4219.90
3321	-	3330	4026.10	4227.50
3331	-	3340	4033.40	4235.20
3341	-	3350	4040.60	4242.80
3351	-	3360	4047.90	4250.20
3361	-	3370	4055.10	4257.80
3371	-	3380	4062.40	4265.50
3381	-	3390	4069.50	4273.10
3391	-	3400	4076.70	4280.50
3401	-	3410	4084.00	4288.10
3411	-	3420	4091.20	4295.70
3421	-	3430	4098.50	4303.30
3431	-	3440	4105.60	4310.90
3441	-	3450	4112.80	4318.50
3451	-	3460	4120.10	4326.10
3461	-	3470	4127.30	4333.70
3471	-	3480	4134.60	4341.20
3481	-	3490	4141.70	4348.80
3491	-	3500	4148.90	4356.40

Rate  
2018

**भारतीय रेल सम्मेलन**  
**माल भाड़ा दर सूची सं. 48, भाग - I (जिल्द - II)**  
**शुद्धि पत्र सं. 02 दिनांक 27, ज्येष्ठ 1937**

**I.R.C.A.**  
**Goods Tariff No. 48, Part I (Vol. II)**  
**Correction Slip No. 02 Dated 17.06.2015**

प्राधिकरण: - रेलवे बोर्ड का पत्र सं. टीसीआर/1078/2015/07, दिनांक 10.04.2015  
(दर परिपत्र - 08/2015 का शुद्धि पत्र सं. 03)

निम्नलिखित परिवर्तन किए गए हैं: -

शुद्धि पत्र सं. 02 दिनांक 27, ज्येष्ठ 1937 पृष्ठ - 23, माल का सामान्य वर्गीकरण - समूह क्रम सं. 25 (एम) के अंतर्गत दिए वस्तुओं एवं अंत में दिए नोट के स्थान पर निम्नलिखित को प्रतिस्थापित करें: -

समूह क्रम संख्या	वस्तु विवरण
25 (एम)	मोटर वाहन *
	मोटर वाहन
	मोटर साइकिलें
	मोटर ट्रैक्टर, अन्य के रूप में
	मोटर कारें
नोट:	* एन.एम.जी./ बी.सी.सी.एन. मालडिब्बों की मानकीकृत वहन क्षमता 58.8 टन होगी।

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Authority: - Railway Board's letter No. TCR/1078/2015/07, dated 10.04.2015  
(Corr. - 03 to RC - 08/2015)


The following alterations are hereby made: -

C.S. No. 02 of 17.06.2015 Page 23, General Classification of Goods, for existing "Commodity description" and "Note" given under group No. 25(m), substitute the following: -

Group No.	Commodity Description
25 (m)	MOTOR VEHICLES *
	MOTOR VEHICLES
	MOTOR CYCLES
	MOTOR TRACTOR NOC
	MOTOR CARS
Note:	* The "Standardized" CC of NMG/BCCN Wagons shall be 58.8 tonnes.

नई दिल्ली/ New Delhi

दिनांक: 27, ज्येष्ठ 1937  
Dated: 17.06.2015

  
सुधेन्दु जे. सिन्हा भा.रे.या.स.  
महासचिव  
Sudhendu J. Sinha IRTS  
Secretary General

**भारतीय रेल सम्मेलन**  
**INDIAN RAILWAY CONFERENCE ASSOCIATION**

**मालभाड़ा सं. 48 भाग- I (जिल्द- II)**

**और**

**मालभाड़ा दर 48 (भाग- II)**

**GOODS TARIFF NO.48 Pt.I (Vol.II)**

**AND**

**GOODS TARIFF NO.48 (PART II)**

इसमें माल भाड़ा दर संख्या 48 भाग- I (जिल्द- II) का सामान्य वर्गीकरण किया गया है जो केन्द्र सरकार द्वारा रेल मंत्रालय (रेलवे बोर्ड) के पत्र संख्या टी.सी.आर./ 1078/2015/07 दिनांक 20.3.2015 से प्राधिकृत है।

दिनांक 01 अप्रैल 2015 से लागू

भारत की सरकारी रेलों पर स्थानीय बुकिंग में तथा सम्मेलन की सभी सदस्य रेलों पर सीधी बुकिंग में उपयोग के लिए।

भाग- I (जिल्द- I) में माल की स्वीकृति, दुलाई और सुपुर्दगी के सामान्य नियम दिए गए हैं।

माल भाड़ा दर संख्या 48 (भाग- II) में माल भाड़ा दर तालिकाएं दी गई हैं।

Goods Tariff No.48 Part I (Vol.II) contains the General Classification of Goods which has the authority of the Central Government vide Ministry of Railways (Railway Board) letter No. TCR/1078/2015/07 Dated 20-03-2015.

In force from 01.04.2015

To be used in local booking over Indian Railways and in through booking over all Railways party to the Association.

Part I (Volume I) Contains General Rules for Acceptance, Carriage and Delivery of Goods.

Goods Tariff No.48 Part II contains Freight Rate Tables.



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## PREFACE

1. This Tariff is in force on the under mentioned Railways, party to the Association, and on the Central Inland Water Transport Corporation Ltd., not party to the Association, subject to the exceptions notified in their current Tariffs :-

Central Inland Water Transport Corporation Ltd. ... C.I.W.T.C

Name of Railways	Code	Name of Railways	Code
Central	C.R.	South East Central	S.E.C.R.
Eastern	E.R.	South Western	S.W.R.
East Central	E.C.R.	Western	W.R.
East Coast	E.CoR.	West Central	W.C.R.
Northern	N.R.		
North Central	N.C.R.	<b>Non-Government Railway</b>	<b>Code</b>
North Eastern	N.E.R.	Kolkata Port Trust	K.P.T.
Northeast Frontier	N.F.R.	Chennai Port Trust	C.P.T.
North Western	N.W.R.	Konkan Rly. Corpn. Ltd.	K.R.
Southern	S.R.	Mumbai Port Trust	Mb.P.T.
South Central	S.C.R.	Pipavav Port Trust	P.P.T.
South Eastern	S.E.R.	Kutch Port Trust	K.P.T.

2. **Mumbai Port Trust Railway** - The Port Trust Railway, while accepting the rules and conditions, collects in Mumbai an additional charge in certain cases as laid down in its Goods Tariff.
3. **Kolkata Port Trust Railway** - The Eastern Railway works the stations on the Port Trust Railway between Howrah Bridge and Cossipore, while South Eastern Railway works Haldia Port.

As regards Docks and jetties, the Port Trust are the terminal agents of the Eastern and South Eastern Railways respectively.

4. **Chennai Port Trust Railway** - The rules, rates and conditions, for all goods entering or leaving the Chennai Harbour by rail are the same as from or to Royapuram for goods from or to and via the Southern (B.G. Section) Railway and as from or to Chennai (Beach) for goods from or to and via the Southern (M.G. Section) Railway plus the local charges as laid down in Part III of the Chennai Port Trust Scale Rates.

## Quotation of Rates

Authentic information in regard to the rates and conditions for goods traffic may be had on application to the following :-

<b>Railway</b>	<b>Authority competent to quote rates</b>
Mumbai Port Trust	Manager, Mumbai
Kolkata Port Trust	(1) Chief Commercial Manager, Eastern Rly, Kolkata-1 So far as their respective traffic Docks and Jetties are concerned. * SER Works Haldia Port (2) Traffic Manager, Port Trust, Kolkata For local traffic between points on the Port Trust Premises.
Central	Chief Commercial Manager, Chhatrapati Shivaji Terminus. Mumbai
Eastern	Chief Commercial Manager, Koilaghat, Kolkata
East Central	Chief Commercial Manager, Hajipur
East Coast Paradip Port Trust	Chief Commercial Manager, East Coast Railway, Bhubaneswar.
Chennai Port Trust	Chief Commercial Manager, Southern Railway (B.G. Section), Chennai.
Northern	Chief Commercial Manager, Baroda House, New Delhi
North Western	Chief Commercial Manager, Jaipur
North Central	Chief Commercial Manager, Allahabad
North Eastern	Chief Commercial Manager, Gorakhpur
Northeast Frontier	Chief Commercial Manager, Maligaon, Guwahati
Southern	Chief Commercial Manager, Chennai
South Central	Chief Commercial Manager, Secunderabad
South East Central	Chief Commercial Manager, Bilaspur
South Western Goa Port Trust	Chief Commercial Manager, S.W. Railway, Hubli
South Eastern Haldia Port Trust	Chief Commercial Manager, S.E. Rly., Strand Road, Kolkata
Western Kutch Port Trust	Chief Commercial Manager, W. Rly., Churchgate, Mumbai
Kandla Port Trust	Dy. CCM (Rates), Western Railway, Churchgate, Mumbai
West Central	Chief Commercial Manager, Jabalpur
Konkan Rly Corpn. Ltd.	Chief Commercial Manager, Konkan Railway, Madgaon, Goa
Pipavav Port Trust	Vice President (Technical), Jeevan Tara Building (First Floor), Sansad Marg, New Delhi
Central Inland Water Transport Corpn. Ltd.	Commercial Manager, C.I.W.T.C. Ltd., Transport Juggarnath Ghat, Kolkata-7



## **GUIDING PRINCIPLES FOR CLASSIFICATION AND GENERAL RULES FOR CHARGING OF FREIGHT**

- 1.0 Classifications of the commodities have been given in the Goods Tariff under Main Commodity Head/Subhead and three divisions of Low Rated Commodities.
- 2.0 The Classification of different commodities under the Main Commodity Head/Subhead given in the Goods Tariff, if not explicitly mentioned otherwise, will be same for their different physical forms/shapes and different conditions, (whether raw or manufactured etc).
- 3.0 A commodity, which has not been included in any of the Main Commodity Heads or three divisions of Low Rated Commodities given in the Goods Tariff, will be charged at Composite Base freight rates applicable for the wagon type in which it is loaded. The base rates are as under:-

<b>Type of wagon</b>	<b>Applicable Class</b>
Tank Wagons	Class-200
Flat Wagons	Class-180
Open (including Hoppers) Wagons	Class-160
Covered Wagons	Class-150

- 4.0 Proposal for assigning trainload classification of a commodity not indicated in the Goods Tariff but having a potential for block rake loading may be sent to Railway Board.
- 5.0 Only train load Classification of commodities has been indicated in the Goods Tariff. The Classification for wagonload movement of the commodity will be as under:-

<b>Trainload Class</b>	<b>Wagonload Class</b>
(a) Up to Class LR <sub>1</sub>	Class-120
(b) Above Class LR <sub>1</sub> And up to Class-190	One Class higher than Trainload class rate or Class-150, whichever is higher
(C) Class-200	Base Freight rate of Class-200 + 5%

- 5.1 MG and NG System: Notwithstanding anything contained in Para 5.0, the Wagonload Class of all commodities shall be one Class higher than their respective Trainload class when loaded on Metre Gauge (MG) and Narrow Gauge (NG) system. However, for the commodities in the highest Class, the Wagonload Class will be same as Trainload Class.
- 6.0 In case of any disparity in classification between English and Hindi version, the classification given in English version shall prevail.
- 7.0 Dangerous/hazardous commodities are indicated with alphabet "d" against the commodity. These commodities are to be charged at the class indicated for the Main Commodity Head/Subhead as the case may be. However, all other dangerous/hazardous commodities, not listed in the Goods Tariff but listed in the "Red Tariff", will be charged at the highest Class-200. Dangerous commodities will not be booked for transportation by Rail unless they are listed in the "Red Tariff".
- 7.1 All conditions for carriage of dangerous/hazardous commodities, as laid down in the Red Tariff, must be followed.
- 8.0 The chargeable weight for all commodities shall be Permissible Carrying Capacity (PCC) of the wagon notified from time to time.
- 9.0 Minimum distance for charge shall be 125 kms for all commodities.
- 10.0 Freight charges for traffic booked under provisions of Goods Tariff will be rounded off to the next higher rupee. Such rounding off of freight per Railway Receipt will be done only once after adding all applicable charges/surcharges like surcharges under Dynamic Pricing policy, etc.
- 11.0 Pre-payment of freight is compulsory for all commodities. In case of E-payment, TMS will permit issue of 'Paid E-RR' when a positive confirmation from Bank is received regarding collection of freight. If Bank sends a message of insufficient funds, system will issue 'To-pay' E-RR. If no message is received from the Bank within 150 seconds for any reason whatever, then system will issue a Paid E-RR subject to conditions laid down for 'Procedure in case of exigencies' under e-payment guidelines.
- 12.0 The commodities attached with "OR" in the column "Risk Rate" will be charged/booked at Owner's Risk. However, commodities with OR rate can be booked at RR rate on payment of 20% surcharge. In all other cases, where "OR" does not appear, commodities be treated to have been charged/booked at Railway Risk Rate.
- 13.0 Packing condition given against the Main Commodity Head/Subhead shall also apply to all commodities mentioned under that Main Commodity Head/Subhead unless other packing condition is specifically mentioned against the respective commodity.
- 13.1 Consignors will have to ensure that the commodities offered for transportation by railways are not defectively or improperly packed depending upon the nature of the commodity and the method of transportation such as in loose condition, in bulk, in bagged condition etc. It should be ensured that the commodities are packed in such a manner that they are not liable to damage, deterioration, leakage or wastage during transit.
- 13.2 It should be ensured that the commodities are packed in bags, containers, drums, cases, cartons etc. of high quality and adequate strength, which can withstand the rigours of transportation and also provide ease of handling. Commodities loaded in loose condition such as bamboos, timber, Iron & steel etc. must be securely tied.

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	GENERAL CLASSIFICATION OF GOODS				
Group No.	Commodity Description	Type of Commo- dity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
GENERAL TARIFF LINES					
1.	ACID AND ALCOHOLS				
	ABSOLUTE ALCOHOLS	d	P5	RR	200
	ACETIC ACID	d			
	BENZOIC ACID				
	BENZYLALCOHOL				
	BORIC ACID				
	BUTYLALCOHOL				
	CITRIC ACID				
	HYDROCHLORIC ACID	d			
	NITRIC ACID	d			
	PHOSPHORIC ACID	d			
	SPIRIT	d			
	SULPHURIC ACID	d			
2.	ALLOYS AND METALS				
	ALLOY PIPES		P2(a)	RR	180
	ALLOY STEEL				
	ALLOY STEEL CASTINGS				
	ALUMINA				
	ALUMINIUM INGOTS				
	ALUMINIUM BILLETS				
	ALUMINIUM POWDER	d			
	BRASS				
	COPPER ANODE & CATHODS				
	COPPER CONCENTRATES				
	COPPER INGOTS				
	COPPER SLAB				
	FERRO CHROME				
	FERRO MANGANESE				
	FERRO SILICON				
	KANSA				
	LEAD				
	SILICO CHROME				
	SILICON				
	SILICON MANGANESE				
	TIN PLATE				
	BEARING PLATES				
	ELECTROPLATED TIN PLATES				
	ZINC				

GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commo- dity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
3.	BRICKS AND STONES				
3(a)	BALLAST		P2(a)	OR	150
	BALLAST CHIPS				
	CERAMIC TILES				
	CHAKKEES				
	FLOORING STONE				
	FLOORING TILES				
	GLASS STONE				
	GRANITE				
	GRANITE BLOCKS UNDRESSED				
	GRANITE BOULDERS UNDRESSED				
	GRAVEL				
	KOTA STONE				
	KUNKER				
	MARBLE CHIPS				
	MARBLE DRESSED				
	MARBLE UN-DRESSED				
	MILL STONE				
	QUARTZ (Chips,Stones,Gravel and Powder)				
	ROLLER STONE				
	SANITARY WARES				
	SLATE				
	SLATE STONE				
	SLATES IN TILES				
	STONE DUST				
	STONE NOC				
	STONE PILLARS				
	STONE WARE				
STONE, Cut and/or Engraved					
STONE GRIT					
3.(b)	BRICKS BROKEN				130
	FIRE BRICKS				
4.	CAUSTIC POTASH AND SODA				
	CAUSTIC POTASH LIQUOR	d	P1 or P5	RR	140
	CAUSTIC POTASH SOLID				
	CAUSTIC SODA				
	SULPHATE OF SODA				
	CAUSTIC SODA LIQUOR	d			
	CAUSTIC SODA LYE				
	CAUSTIC SODA FLAKES	d			
	CHLORATE OF SODA	d			
	SODA ASH		P1 P1 or P5		
	SODA BICARBONATE				
	SULPHUR				
	WASHING SODA				



GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commo- dity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
5. CEMENT					
5(a)	ACID RESISTING CEMENT		P5	RR	140
	ASBESTOS		P1		
	ASBESTOS JOINTING AND PACKING SHEETS NONGRAPHITED				
	BEAMS (PRESTRESSED CEMENT CONCRETE)				
	CEMENT				
	CEMENT BLOCKS		P2(a)		
	CLINKER				
	CEMENT MANUFACTURED		P2(b), P4		
	CEMENT PIPES		P2(b)		
	CEMENT PLASTER		P1		
	CEMENT SHEETS				
	CEMENT TILES		P4		
	COLOURED CEMENT		P1		
	COLUMNS (PRESTRESSED CEMENT CONCRETE)				
	OIL WELL CEMENT				
	POST SLEEPERS(PRESTRESSED CEMENT CONCRETE)				
	POZZOLONA CEMENT				
	PRESTRESSED CEMENT CONCRETE				
	SUPER FINE CEMENT				
	SUPER MASONRY CEMENT				
	WHITE CEMENT				
5. (b)	FLY ASH		P2(a)		120
6. CHEMICAL MANURES					
	AMMONIUM NITRO PHOSPHATE		P1	RR	130
	AMMONIUM PHOSPHATE				
	AMMONIUM SULPHATE NITRATE				
	AMMONIUM SULPHATE PHOSPHATE				
	BENTONITE SULPHUR PASTILLES				
	(STRAIGHT SULPHUR FERTILIZER)				
	BORONATED SUPHALA				
	CALCIUM AMMONIUM NITRATE				
	CALCIUM AMMONIUM NITRO PHOSPHATE				
	CHEMICAL MANURE NOC *				
	CALCIUM NITRATE	d			
	CALCIUM SULPHATE				
	COMPLEX FERTILIZER				
	CYANAMIDE				
	DI-AMMONIUM PHOSPHATE				
	GROUND PHOSPHATE				
	KAINITE				
	LIME NITROGEN				

GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commo- dity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
Note –	MANURE MIXTURE		P1	RR	130
	MINERAL PHOSPHATE				
	MONO-AMMONIUM PHOSPHATE				
	MURIATE OF AMMONIA				
	MURIATE OF POTASH				
	MURIATE OF POTASH NOC				
	MYCEILUM				
	NEEM COATED UREA				
	NITRO PHOSPHATE				
	NITROPHOSKA				
	NPK FERTILIZER				
	ROCK PHOSPHATE (IN BAG)				
	ROCK PHOSPHATE (LOOSE)				
	SINGLE SUPER PHOSPHATE				
	SNPK FERTILIZERS				
	SODIUM SULPHIDE				
	SULPHATE OF AMMONIA				
	SULPHATE OF ZINC				
	SUPER PHOSPHATE				
	TRIPLE SUPERPHOSPHATE				
	UREA				
	UREA AMMONIUM PHOSPHATE 20.20.0				
	URVARA				
	WATER SOLUBLE FERTILIZER				
* The Chemical Manures included in the Fertiliser Control Order issued by the Ministry of Agriculture and Rural Development (Department of Agriculture and Co-operation), would ONLY be treated as Chemical Manures NOC.					
7.	CLAY AND SAND				
7.(a)	CLAY NOC		P2(a)	RR	150
	GROUND SILICA				
	LUTING SAND				
	MOORUM				
	OCHRE IN LUMPS				
	OCHRE IN POWDER				
	OCHRE, NOC				
	RED MUD				
	SAND				
	SILICA SAND				
	WHITE CLAY (LUMPS/POWDER)				
	7.(b)				
BENTONITE POWDER					
CHINA CLAY					
FIRE CLAY					



GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commodity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
8.	<b>COAL AND COKE</b>				
	ANTHRACITE COAL				
	ASSAM COAL				
	BHUTAN COAL				
	BRIQUETTED FUEL MIXTURE				
	CALCINED PETROLEUM COKE				
	CILCOKE / CILCOKE FINES				
	COAL BRIQUETTES				
	COAL CHAR				
	COAL DUST	d			
	COAL FINES				
	COAL SHALE				
	COAL (GOVT RLY ACCOUNT)				
	COKE				
	COKE BRIQUETTES				
	COKE HARD				
	COKE SOFT				
	COKING COAL				
	COKING COAL (IMPORTED)				
	COKING COAL WASHED				
	HARD COKE REJECTIONS				
	LIGNITE				
	METALLURGICAL COKE				
	MIDDLING COAL				
	NON COKING COAL WASHED				
	NUT COKE (IN OPEN WAGON)				
	PATENT FUEL (AS COAL)				
	PEARL COKE (IN COVERED WAGON)				
	PETROLEUM COKE				
	RAW PETROLEUM COKE				
	RUN OFF MINES (ROM) COAL				
	RUN OFF MINES (ROM) COAL (A)				
	RUN OFF MINES (ROM) COAL (B)				
	RUN OFF MINES (ROM) COAL (C)				
	RUN OFF MINES (ROM) COAL (D)				
	RUN OFF MINES (ROM) COAL (E)				
	RUN OFF MINES (ROM) COAL (F)				
	SLACK COAL (GOVT RLY ACCOUNT)				
	SLV SLACK COAL				
	SLV STEAM COAL				
	SPECIAL QUALITY LOW ASH METALLURGICAL COKE				
	STEAM COAL				
	STEAM COAL (IMPORTED)				
	WASHED COAL				
	WASHERY MIDDLING COAL				

GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commodity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
9.	FOODGRAINS, FLOURS AND PULSES				
	ATTA				
	BAJRA				
	BESAN				
	CHANA DAL				
	CORN GERMS				
	DHALL				
	GRAINS AND PULSES NOC				
	GRAM				
	GRAM DAL				
	JOWAR				
	MAIDA				
	MAIZE				
	MAIZE GERMS				
	MILO (MILLETS)				
	MOONG DAL				
	MUSOOR DAL				
	PADDY				
	PADDY PARCHED				
	PEAS		P1 & S2	RR	130
	PULSES				
	RICE				
	RICE BOILED GR-A (BRA)				
	RICE (BROKEN)				
	RICE (IR-8)				
	RICE BASMATI				
	RICE BASMATI (BROKEN)				
	RICE COMMON (R)				
	RICE COMMON BOILED (BR)				
	RICE PARMAL (BROKEN)				
	RICE RAW GR-A (RRA)				
	SUJI				
	TOOR DAL				
	URAD DAL				
	WHEAT				
	WHEAT (PFG)				
	WHEAT (SFG)				
10.	FISH MEAL				
	FLOATING FISH FEED		P1	RR	100

GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commo- dity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
11.	HYDROGENATED AND OTHER EDIBLE OILS				
11.(a)	ALL REFINED & NON REFINED EDIBLE OILS		P-2	RR	140
	CASTOR OIL				
	CORN OIL				
	CRUDE DEGUMMED SOYA				
	CRUDE PALMOLEIN				
	GROUNDNUT OIL				
	MUSTARD OIL				
	PALM OIL				
	SOYABEAN OIL				
	SUNFLOWER OIL				
	VANASPATI GHEE				
11.(b)	CORN OIL (In covered wagons)		P5	RR	LR3
	GROUND NUT OIL(In covered wagons)				
	HYDROGENATED OILS (in covered wagons)				
	PALM OIL (in covered wagon)				
	SOYABEAN OIL (In covered wagons)				
	SUNFLOWER OIL (In covered wagons)				
12.	IRON OR STEEL				
12.(a)	ALLOY CONSTRUCTIONAL STEELS		P2(b)	RR	165
	ANGLES				
	AXLES IRON OR STEEL NOC				
	BANDS				
	BARS INCLUDING CARBON STEEL BARS				
	BARS IRON OR STEEL GALVANISED				
	BEAMS				
	BILLETS				
	BLOOMS				
	CABLES WIRE				
	CASTINGS NOC				
	CHAINS IRON NOC				
	CHANNELS				
	COLD ROLLED COILS				
	COLD ROLLED SHEETS				
	COLLIERY ARCH AND Z-PILLING				
	CORRUGATED SHEETS				
	DOG SPIKES				
	ELASTIC RAIL CLIPS (STYPE)				
	FISH PLATES				
	FITTINGS PIPES				
	FLAT IRON OR STEEL GIRDERS				
	FLAT, IRON OR STEEL				
	GALVANISED SHEETS (CORRUGATED)				

GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commodity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
	GALVANISED SHEETS (PLAIN) GALVANISED COILS GUTTERS HEAVY ROLLS SPOILS HOT ROLLED COILS HOT ROLLED SHEETS INGOTS IRON OR STEEL MATERIAL USED OLD DEFACED FOR REROLNG MELTING IRON OR STEEL SLAB IRON OR STEEL PIPE CUTTINGS IRON SHEET CUTTINGS JOINTS LATTICE/TRANSMISSION TOWER PARTS MILL SCALE IRON OR STEEL NICKLED STEEL BARS PERMANENT WAY MATERIALS NOC PILES SCREWS PLATES POLES RAILS P WAY MATERIAL NOC RODS INCLUDING HIGH CARBON STEEL RODS ROUNDS SAFES IRON SAFES STEEL SHEETS SHELL BLOOMS SLEEPERS (CAST IRON) SLEEPERS (OTHER THAN CAST IRON) SPOONS (IRON) SPRINGS SQUARES (CAST IRON) SQUARES (OTHER THAN CAST IRON) STAINLESS STEEL STAINLESS STEEL BARS STAINLESS STEEL RODS STAINLESS STEEL SHEETS STAINLESS STEEL SLABS STAINLESS STEEL WARE STEEL SHEET CUTTINGS STEEL SHEETS PILINGS STRUCTURAL COBBLES TACKS TIES		P2(b)	RR	165

GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commodity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
	TIN BARS TYRES (IRON) WEIGHTS WHEELS		P2(b)	RR	165
12. (b)	PIPES (API) OF ANY LENGTH & DIA LOADED PIPES (STEEL) OF ANY LEN & DIA (ABOVE 80 MM) RIBBED WIRE ROD IN COILS SPIRAL WELDED STEEL PIPES (WITH DIA LESS THAN 610 MM) STAINLESS STEEL PIPES STEEL PIPES WIRE ROD IN COILS		P2(b)	RR	130
13.	LEATHER, RUBBER AND PLASTIC				
13. (a)	HIDES & SKINS LEATHER CLOTH LEATHER GOODS LEATHER REFUSE PLASTIC GOODS PVC COMPOUND PVC PIPES RUBBER CRUDE RUBBER TYRES AND TUBES		P3     P2(b) or P4	OR	100
13. (b)	PVC POWDER		P1		110
14.	MINERALS AND ORES				
14.1	IRON ORE				
	IRON ORE CALIBRATED LUMP IRON ORE IRON ORE NATURAL PELLET NON CALIBRATED LUMP IRON ORE IRON ORE PELLETS IMPORTED IRON ORE SINTER IRON ORE POWDER IRON ORE LUMP IRON ORE FINES BLUE DUST HOT BRIQUETTED IRON		P2(a)	RR	165

GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commodity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
<b>14.2</b>	<b>MINERALS AND ORES OTHER THAN IRON ORE</b>				
<b>14.2(a)</b>	ALUNITE		<b>P2(a)</b>	<b>RR</b>	<b>160</b>
	BARYTES				
	BARYTES POWDER				
	BAUXITE				
	CALCITE				
	CHROME ORE				
	FELSPAR				
	ILIMENITE ORE				
	IRON PYRITES				
	LATERITE				
	LITHIUM ORE				
	PYROXINITE				
	SOAP STONE				
	SOAP STONE POWDER				
	SOAP STONE TILES				
	ZINC ORES				
<b>14.2(b)</b>	CHEMICAL GYPSUM		<b>P2(a)</b>	<b>RR</b>	<b>150</b>
	GYPSUM				
	GYPSUM IN LUMPS				
	GYPSUM IN POWDER				
	MARINE GYPSUM				
	MINERAL GYPSUM				
<b>14.2(c)</b>	DOLOMITE		<b>P2(a)</b>	<b>RR</b>	<b>145</b>
	DOLOMITE CHIPS				
	DOLOMITE LUMPS				
	DOLOMITE POWDER				
	DUNITE				
	LIME (INCLUDING HYDRATED LIME, QUICK LIME, BURNT LIME, LIME POWDER)				
	LIME STONE				
	LIME STONE CHIPS				
	LIME STONE POWDER/LUMPS				
	MANGANESE ORES				

GENERAL CLASSIFICATION OF GOODS							
Group No.	Commodity Description	Type of Commo- dity	Packing Condition	Risk Rate	Base Class		
(1)	(2)	(3)	(4)	(5)	(6)		
15.	MACHINERY AND MACHINE TOOLS						
	AXLES WITH WHEELS		P4	OR	100		
	BOILERS						
	CRANES						
	ENGINES						
	LOCOMOTIVES UNASSEMBLED COMPONENT PARTS						
	MACHINERY PARTS						
	SEWING MACHINES						
	VEHICLES RAILWAY UNASSEMBLED COMPONENT PARTS						
	WAGONS RAILWAY UNASSEMBLED COMPONENT PARTS						
16.	METAL SCRAP AND PIG IRON						
16.(a)	BRASS SCRAP		P2(a)&S1	RR	150		
	COPPER SCRAP						
	IRON PIG (PIG IRON)						
	IRON SCRAP						
	SPONGE IRON						
	STEEL/STAINLESS STEEL SCRAP						
16.(b)	COPPER SLAG				P2(a)&S1	RR	140
	FERRO MANGANESE SLAG						
	GROUND GRANULATED BLAST-FURNACE SLAG						
	IRON AND STEEL SLAG						
	IRON AND STEEL SLAG (GRANULATED)						
	SLAG						
	SLAG NOC						
17.	OIL CAKES AND SEEDS						
	COTTON SEED		P1	RR			120
	COTTON SEED OIL CAKES						
	COTTON SEED WASTE						
	DE-OILED CAKES						
	DE-OILED RICE BRAN						
	GINGELLY SEED						
	LINSEED						
	MUSTARD SEEDS						
	OILED CAKES						
	RAPE SEEDS						
	SAL SEEDS						
	SOYABEAN						
	SOYABEAN EXTRACTIONS/TOSTED						
	MEALS/FLAKES						
	SOYABEANS SEEDS						
	SUNFLOWER SEEDS						



GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commodity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
<b>18.</b>	<b>PETROLEUM PRODUCTS AND GASES</b>				
<b>18.(a)</b>	ALKYLATE	<b>d</b>		<b>RR</b>	<b>180</b>
	AVIATION SPIRIT				
	AVIATION TURBINE FUEL (ATF)				
	CARBON BLACK FEED STOCK				
	CRUDE OIL				
	DIESEL OIL				
	FURNACE OIL				
	FUSEL OIL				
	HEXANE				
	HIGH SPEED DIESEL (HSD)				
	HIGH SPEED DIESEL (HSD) BLENDED WITH BIO-DIESEL				
	LIGHT DIESEL OIL				
	LOW SULPHUR HEAVY STOCK				
	LUBRICATING OILS NOC				
	METHANE GAS				
	NAPHTHA				
	NAPHTHA (BARAUNI)				
	NAPHTHA (KOYALI)				
	PARAFFIN OIL				
	PETROL (MOTOR SPIRIT)				
	PETROL (MOTOR SPIRIT) blended with ethanol				
	REFORMAT				
	RESIDUAL FUEL OIL (RFO)				
	TOLUENE				
	XYLENE				
<b>18.(b)</b>	BITUMEN		<b>P5</b>	<b>RR</b>	<b>160</b>
	COALTAR				
	COAL TAR PITCH				
	COAL TAR PITCH (SOLID)		<b>P1</b>		
<b>18.(c)</b>	LIQUEFIED PETROLEUM GAS (LPG)			<b>RR</b>	<b>165</b>
	LIQUEFIED BUTANE				
	LIQUEFIED PROPANE				
	SUPERIOR KEROSENE OIL				
<b>18.(d)</b>	AMMONIA (ANHYDROUS LIQUEFIED GAS)	<b>d</b>		<b>RR</b>	<b>200</b>
	AMMONIA LIQUIFIED GAS				
	ARGON GAS				
	COMPRESSED GASES				
	NITROGEN GAS				

GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commo- dity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
19.	SALT				
19.(a)	BLACK SALT		P1 & S3	OR	100
	EARTH SALT				
	IODISED SALT				
	NON REFINED SALT				
	NON REFINED SALT FOR HUMAN CONSUMPTION (IODISED SALT/SALT MEANT FOR IODISATION)				
	REFINED IODISED SALT				
	REFINED SALT				
	ROCK SALT				
	SALT FOR TABLE USE				
	VACUUM SALT				
19.(b)	SALT FOR INDUSTRIAL USE		P1		120
20.	SOAP				
	LIQUID SOAP		P1 or P2(a) or P4 or P5	RR	120
	SOAP				
	SYNTHETIC DETERGENTS				
	SYNTHETIC SOAP				
21.	SUGAR				
	RAW CANE SUGAR		P1	RR	120
	SUGAR (GR.A)				
	SUGAR (GR.B)				
	SUGAR (GR.C)				
	SUGAR CANDY				
22.	MISCELLANEOUS				
	ASHES		P2(a)	RR	140
	BETEL NUTS		P1		150
	CHALK CALCIUM CARBONATE		P1		140
	CHALK IN LUMPS OR POWDER		P1		140
	GLUCOSE		P4 OR P5		150
	GUNNIES		P3		120
	GUNNY BAGS				120
	HOUSEHOLD EFFECTS				150
	MOLASSES		P5		150
	MOLASSES SUGAR MILL (NOT KHANDSARI MOLASSES)				150
	MONO CALCIUM PHOSPHATE FOR ANIMAL, AQUA AND POULTRY FEED		P1		130
	PUTTY		P2(a)		150
	SECONDARY NUTRIENT/SOIL CONDITIONER(CMS)		P1		150
	STARCH		P1 or P4 or P5		120

GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commodity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
	<b>LOW RATED TARIFF LINES</b>				
<b>23.</b>	<b>DIVISION - 'A'</b>				
<b>23.(a)</b>	<b>ELECTRICAL APPLIANCES AND FITTINGS</b>				
	ELECTRONIC INSTRUMENTS NOC				
	TELEVISION SETS				
	JOINTING MATERIALS				
	ELECTRIC APPLIANCES NOC				
	DRY BATTERIES				
	DYNAMOS				
	ELECTRIC MOTORS		<b>P4</b>	<b>RR</b>	<b>LR1</b>
	ELECTRIC PUMPS				
	GENERATORS				
	GENERATORS, SMOKE				
	ELECTRIC WIRES				
	ELECTRIC BULBS				
	ELECTRIC FANS				
	FUSE WIRE				
	EMPTY DRUMS				
	JERRY CANS		<b>P2(b)</b>	<b>RR</b>	<b>LR1</b>
	BARRELS				
23.(b)	GUR				
	JAGREE POWDER		<b>P1</b>	<b>RR</b>	<b>LR1</b>
	JAGREE				
23.(c)	JUTE		<b>P3</b>	<b>RR</b>	<b>LR1</b>
	JUTE CADDIES				
23.(d)	MILK		<b>P4 or P5</b>	<b>OR</b>	<b>LR1</b>
	MILK PRODUCTS				
23.(e)	ORGANIC MANURES		<b>P2(a)</b>	<b>RR</b>	<b>LR1</b>
23.(f)	PAINTS AND POLISHES		<b>P5</b>	<b>RR</b>	<b>LR1</b>
	COLOURS AND DYES				
23.(g)	TIMBER				
	FIRE WOOD				
	PLYWOOD IN BOARDS, PANELS				
	SANDAL WOOD		<b>P2(b)</b>	<b>RR</b>	<b>LR1</b>
	SPLINTS FOR MATCHES				
	WOOD PIECES				
23.(h)	TIMBER WASTE				<b>LR2</b>
23.(i)	VEGETABLE OIL PITCHES		<b>P5</b>	<b>RR</b>	<b>LR1</b>
23.(j)	WATER			<b>RR</b>	<b>LR1</b>
23.(k)	FIREWORKS	<b>d</b>		<b>RR</b>	<b>LR1</b>

GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commodity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
<b>24.</b>	<b>DIVISION -'B'</b>				
24.(a)	BOILER COMPONENTS		<b>P4</b>	<b>RR</b>	<b>LR2</b>
24.(b)	CHARCOAL		<b>P2(a)</b>	<b>OR</b>	<b>LR2</b>
24.(c)	PAPER NOC IN BUNDLES				
	PAPER				
	CARD BOARDS				
	PAPER IN REELS/ROLLS		<b>P3</b>	<b>RR</b>	<b>LR2</b>
	PAPER WASTE				
	PAPER CUTTINGS				
	PAPER SLUDGE				
<b>25.</b>	<b>DIVISION -'C'</b>				
25.(a)	BAMBOOS				
	BAMBOO CUTS				
	BAMBOO CHIPS				
	BAMBOO CRUSHED		<b>P2(b)</b>	<b>RR</b>	<b>LR3</b>
	BAMBOO PULP				
	STICKS				
25.(b)	BROOMS		<b>P2(b)</b>	<b>RR</b>	<b>LR3</b>
25.(c)	COFFEE AND TEA		<b>P4</b>	<b>RR</b>	<b>LR3</b>
25.(d)	COIR		<b>P2(b)</b>	<b>RR</b>	<b>LR3</b>
	COIR MATS				
25.(e)	<b>COTTON AND OTHER TEXTILE</b>				
	COTTON AND OTHER TEXTILES NOC				
	BED SHEETS				
	COTTON HALF/FULL PRESSED				
	COTTON RAW FULL PRESSED				
	COTTON RAW		<b>P3</b>	<b>RR</b>	<b>LR3</b>
	HAND SPUN YARN COTTON				
	KHADDAR				
	SILK				
	SYNTHETIC YARNS				
	TOWELS				
	WOOL				
25.(f)	<b>FODDER AND HUSK</b>		<b>P2(a)</b>		
	FODDER AND HUSK NOC				
	BARLEY HUSK				
	BHOOSA				
	CHARI				
	COTTON SEED HUSK				
	COCONUT HUSK		<b>P1</b>		
	DRY GRASS		<b>P2(a)</b>	<b>RR</b>	<b>LR3</b>
	GRAM HUSK		<b>P1</b>		
	HAY				
	KIRBY				
	KIRBY KUTTI (KUTTAR)				

GENERAL CLASSIFICATION OF GOODS					
Group No.	Commodity Description	Type of Commodity	Packing Condition	Risk Rate	Base Class
(1)	(2)	(3)	(4)	(5)	(6)
	PADDY HUSK		P1	RR	LR3
	PEAS HUSK				
	TOOR HUSK				
	WHEAT BRAN(CHOKAR)				
25.(g)	CHUNI		P1		LR1
25.(h)	<b>FRUITS AND VEGETABLES</b>		P2(a)	OR	LR3
	FRUITS AND VEGETABLES NOC				
	BANANA				
	GARLIC				
	DATES				
	MANGO		P4		
	ORANGE				
	ONIONS		P2(a)		
	POTATOES				
	POTATOES SWEET				
25.(i)	<b>GROCERIES</b>		P1	RR	LR3
	GROCERIES NOC				
	ALUM				
	PICKLES (INDIGENOUS)				
	CHILLIES				
	EDIBLE SNACKS				
	EXTRUDED FOODS				
	JEERA				
	PEPPER				
	SPICES				
	MAIZE FLAKES				
	RICE FLAKES				
	RICE PARCHED				
	SAGO COMMON				
	TURMERIC				
25.(j)	SOYA PROTEIN TEXTURED		P5	RR	120
25.(k)	I. V. AND INSECTICIDE FLUID		P5	RR	LR3
25.(l)	LIVE STOCK			OR	LR3
25.(m)	<b>MOTOR VEHICLES *</b>				
	MOTOR VEHICLES		P6(a)	OR	LR3
	MOTOR CYCLES		& (b)		
	MOTOR TRACTORS NOC				
	MOTOR CARS (IN NMG/BCCN WAGON)				
Note :-	*The standardized CC of NMG & BCCN wagons shall be 58.8 tonnes.				
25.(n)	BAGASSE		P2(a)	RR	LR3
	SUGARCANE				

**प्रधान सचिव, खान एवं भूतत्त्व विभाग की अध्यक्षता में दिनांक 06.01.2018 को मध्याह्न 12.00 बजे विभागीय समीक्षात्मक बैठक की कार्यवाही।**

**उपस्थिति संलग्न:—**

विशेष सचिव—सह—निदेशक द्वारा बैठक में उपस्थित सभी पदाधिकारियों एवं कर्मचारियों को नववर्ष 2018 की शुभकामना के साथ बैठक की कार्यवाही प्रारंभ की गई एवं आवश्यक निर्देश दिए गये :—

विशेष सचिव—सह—निदेशक द्वारा यह बताया गया कि पूर्व की बैठक में दिये गये दिशा—निर्देश का अनुपालन सही ढंग से नहीं किया जा रहा है। विश्वस्त सूत्रों से निदेशक महोदय को जानकारी प्राप्त हो रही है कि विभाग द्वारा दिये गये दिशा—निर्देश को स्पष्ट तौर पर क्षेत्रीय वरीय प्रभारी पदाधिकारियों को मुख्यतः समझने में कठिनाई हो रही हैं, जिसके कारण अनेकों समस्याएँ उत्पन्न हो रही हैं। निदेशक महोदय द्वारा यह भी बताया गया कि आने वाले दिनों में इस तरह की Confusion नहीं होनी चाहिए।

समीक्षोपरान्त यह भी निर्देश दिया गया कि पिछले बैठक में भी चेतावनी दी गई थी, विभागीय मामलों को आम जनता/मिडिया या अन्य किसी स्रोत से गलत सूचना से अफवाहें न फैले। इस संबंध में सचेष्ट रहें। विभाग के वरीय पदाधिकारियों से सम्पर्क स्थापित कर वास्तविक जानकारी हासिल करने का निर्देश दिया गया।

समीक्षा के क्रम में निदेशक द्वारा बताया गया कि BSMC के अधीनस्थ कर्मियों को जिला खनन पदाधिकारी के नियंत्रण में कार्य करना है एवं जिला खनन पदाधिकारी को अधीनस्थ जिला पदाधिकारी के नियंत्रण में नियमानुसार कार्य करना है।

**1. अवैध खनन के विरुद्ध समीक्षा:—**

दिनांक 01.12.2017 से 31.12.2017 एवं 01.01.2018 से 05.01.2018 तक अवैध खनन/परिवहन/भंडारण से संबंधित प्राप्त प्रतिवेदन/सूचना के आधार पर जिन-जिन जिलों का गिरफ्तारी शून्य है उन-उन जिलों को सख्त निदेश दिया गया कि अगले माह की विभागीय समीक्षात्मक बैठक में कम-से-कम दस (10) गिरफ्तारी पूर्ण होना चाहिए।

विभिन्न जिलों यथा:— शेखपुरा के MMD/खान निरीक्षक, खगड़िया, सीतामढ़ी, अररिया एवं मोतिहारी, किशनगंज, समस्तीपुर, मधुबनी, कैमूर, गोपालगंज एवं अरवल जिलों का कार्य असंतोषजनक रहने के कारण उन जिलों के प्रभारी पदाधिकारियों से स्पष्टीकरण पूछने का निदेश दिया गया तथा तत्काल वेतन बंद का आदेश दिया गया।

समीक्षोपरान्त निदेशक द्वारा अवगत कराया गया कि सूदूर सीमावर्ती क्षेत्रों से ट्रक/ट्रैक्टर एवं हाईवा के माध्यम से लघु खनिजों को परिवहन किया जा रहा है जिस पर समुचित कार्रवाई नहीं हो पा रही है एवं Border Area पर भी सख्त निगरानी रखने का निर्देश दिया गया।

## 2. ईट भट्टों का परिवहन:—

समीक्षा के क्रम में प्रधान सचिव द्वारा बताया गया कि 15.01.2018 से ईट भट्टों का परिवहन ई-चालान के माध्यम से किया जायेगा। जब्त ईटों को दिनांक 15.01.2018 से Buffer Stock में जमा करने का निर्देश दिया गया। तत्काल उन ट्रैक्टर ट्रकों में GPS की आवश्यकता नहीं है जो ईटों का परिचालन कर रहे हैं।

ईट-संचालकों द्वारा समेकित स्वामित्व का वगैर भुगतान किए कई वर्षों से ईट-भट्टा का संचालन किया जा रहा है, जिस पर कार्रवाई की जाए, साथ ही संचालित ईट-भट्टों/असंचालित ईट भट्टा की सूची मुख्यालय को उपलब्ध करने का निर्देश दिया गया।

### अन्य महत्वपूर्ण बिन्दु:—

1. बिहार राज्य खनिज निगम (BSMC) को लघु खनिजों को निश्चित मात्रा Buffer Stock के रूप में रखने हेतु 20 जिलों द्वारा भूमि का चयन किया जा चुका है, बाकि 16 जिलों के प्रभारी पदाधिकारी/डिपो प्रबंधक को सख्त निर्देश दिया गया कि वे दो दिनों के अन्दर भूमि का चयन कर अद्यतन प्रतिवेदन मुख्यालय को उपलब्ध करावें, ताकि आवश्यक कार्रवाई की जा सके।
2. समीक्षा के क्रम में प्रधान सचिव द्वारा बताया गया कि जिन जिलों द्वारा 1/- (एक रुपया) प्रति वर्गफीट के हिसाब से भूमि का चयन किया गया है, उसे घटाकर 50/- पैसा प्रति वर्गफीट करना सुनिश्चित करें। 19 जिलों में 50 पैसा प्रति वर्गफीट के हिसाब से जमीन देने के लिए तैयार हो गया है। इस संबंध में अद्यतन प्रतिवेदन उपलब्ध कराने का निर्देश दिया गया। सभी संबंधित प्रभारी पदाधिकारी/डिपो प्रबंधक को चेतावनी दी गई है कि वे यथाशीघ्र 50/- पैसा प्रति वर्गफीट की दर से जमीन की खोज करें, अन्यथा आपकी मिलीभगत मानी जायेगी एवं इस आशय का पत्र संसूचित कर दिया जायेगा।
3. Buffer Stock में लघु खनिजों का नाप-तौल की सही पद्धति संबंधित डिपों प्रबंधक को दी गई है। डिपो प्रबंधक की जबाबदेही बनती है कि वे पंजी में लघु खनिज लदे वाहनों का आगमन/प्रस्थान, तिथि एवं समय का सही ढंग से इन्ट्री करें, ताकि सही वस्तुस्थिति की जानकारी प्राप्त हो सके। प्रतिदिन इन्ट्री करने के बाद ही डिपों प्रबंधक अपने घर प्रस्थान करेंगे।
4. छापेमारी के दौरान पकड़े गए ट्रक/ट्रैक्टर में लदे बालू को जब्त कर Buffer Stock में Unloading करने का निर्देश दिया गया। सर्वप्रथम First Phase में Buffer Stock पर 1-1 लाख CFT बालू का भंडारण नितान्त आवश्यक है।
5. बड़े-बड़े निर्माण कार्यों के लिए जिसमें बालू की उपलब्धता काफी बड़े पैमाने पर होती है। इस संबंध में कार्य विभागों के लिए PMU द्वारा एक System विकसित किया गया है। इस संबंध में सभी संबंधित जिला



पदाधिकारी को भी पत्र संसूचित किया गया है एवं नोडल पदाधिकारी का भी गठन किया गया है।

6. प्रधान सचिव द्वारा निदेश दिया गया कि सभी जिलों में गठित टॉस्क फोर्स की बैठक में कार्य विभाग के इंजीनियर्स के साथ बैठक सुनिश्चित करें साथ-ही-साथ DEIAA एवं DEAC की भी बैठक संयुक्त रूप से कराई जाय। बैठक की कार्यवाही पर अगले दिन सदस्यों का हस्ताक्षर कर विभाग को भी भेजना सुनिश्चित करें।
7. जिलों में गठित Buffer Stock केन्द्रों पर सुरक्षा बलों को ठहरने के लिए तम्बू (Tent) की व्यवस्था सुनिश्चित करें।
8. समीक्षा के क्रम में प्रधान सचिव द्वारा बताया गया कि बड़ी-बड़ी योजनाओं के लिए घाट पर 900/-रुपये प्रति 100 CFT एवं 5% BSMC कमीशन के साथ छोटी-छोटी योजनाओं के लिए 2400/- रुपये प्रति 100 CFT 5% BSMC कमीशन के साथ Buffer Stock से दिये गये दिशा-निर्देश के आलोक में कार्रवाई सुनिश्चित करनी है।
9. PMU के कर्मियों को प्रधान सचिव द्वारा निर्देश दिया गया कि System में GPS तथा गाड़ी का नम्बर दोनो इन्ट्री करना नितान्त आवश्यक है, ताकि सही दिशा-निर्देश का अवलोकन हो सके।
10. जिन-जिन जिलों से बैंक गारंटी प्राप्त हो चुके हैं प्रभारी पदाधिकारी को निदेश दिया गया कि वे संबंधित बैंक मैनेजर से सत्यापित करा लें।
11. समीक्षा के क्रम में आई0टी0 प्रबंधक को निदेश दिया कि जिन जिलों में Bluetooth Printer/Computer/Printer इत्यादि की आवश्यकता हो तो उसकी सूची बनाकर श्री संतोष कुमार, आई0 टी0 प्रबंधक को लिखित रूप में देना सुनिश्चित करें।
12. सभी नियंत्री पदाधिकारी (DDO) को निर्देश दिया गया कि जिन-जिन मदों में आवश्यकतानुसार राशि की आवश्यकता हो उसे विहित प्रपत्र में लिखित रूप में भेजें, ताकि राशि सरेण्डर न हो सके।

**अन्त में प्रधान सचिव द्वारा सभी पदाधिकारियों एवं कर्मियों को पूरी पारदर्शिता, कर्मठता एवं उत्तरदायित्व के साथ कार्य करने का निदेश दिया गया।**

**धन्यवाद ज्ञापन के साथ बैठक की कार्यवाही संपन्न की गई।**


ह0/—  
(के0के0पाठक)  
प्रधान सचिव

**बिहार सरकार**  
**खान एवं भूतत्व विभाग**

ज्ञापक— प्र01(विविध) बैठक—15/17-285 /एम0, पटना, दिनांक - 15/11/18

प्रतिलिपि:— माननीय मंत्री, खान एवं भूतत्व विभाग, बिहार पटना के आप्त सचिव/ प्रधान सचिव, खान एवं भूतत्व विभाग, बिहार, पटना के प्रधान आप्त सचिव/ विशेष सचिव—सह—निदेशक, खान एवं भूतत्व विभाग, बिहार पटना/विशेष सचिव, खान एवं भूतत्व विभाग, बिहार, पटना। विशेष कार्य पदाधिकारी/अवर सचिव/सहायक आन्तरिक वित्तीय सलाहकार/उप निदेशक (मु0)/सहायक निदेशक (मु0)/सभी उप निदेशक/सभी सहायक निदेशक/सभी खनिज विकास पदाधिकारी/सभी खान निरीक्षक—सह—सक्षम पदाधिकारी/प्रशाखा पदाधिकारी/सभी सहायक/ आई0टी0 प्रबंधक/श्री मृणाल किशोर, डाटा इंटी ऑपरेटर/PMU को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

उद्भ  
12/11/18

  
(राजेश कुमार)  
विशेष कार्य पदाधिकारी

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बिहार सरकार  
खान एवं भूतत्व विभाग  
अधिसूचना

पटना, दिनांक- २४/१/१२

एस०ओ०सं०- २४५/१४०, बिहार लघु खनिज समनुदान नियमावली, १९७२ के नियम २६(क) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुये राज्य के अन्तर्गत स्थित विभिन्न क्षेत्रों में असैनिक निर्माण कार्य की स्थिति, जनसंख्या स्थिति, औद्योगिक निर्माण कार्य की स्थिति, शहरीकरण की अवस्था एवं औद्योगिक विकास की गति को ध्यान में रखते हुये बिहार के राज्यपाल के पूर्व की अधिसूचना एस०ओ०सं० २७ दिनांक २४.३.२००१ का संशोधन करते हैं एवं विभिन्न क्षेत्रों को श्रेणियों में विभाजित करते हुये प्रत्येक स्थायी चिमनी एवं बंगला ईट भट्ठों के लिये ईंटों की संख्या और उस पर ईट भट्ठा मालिकों / ईट भिट्टी हटाने वालों द्वारा प्रति भट्ठा प्रति वर्ष राज्य सरकार को देय समेकित स्वामित्व की राशि निर्धारित करते हैं जो निम्नलिखित तालिका में दिखाई गई है:-

तालिका

क्रमांक	क्षेत्र की श्रेणी	जिला का नाम तथा क्षेत्र	क्षमता स्तंभ ३ में दिखाये गये क्षेत्र में स्थित प्रति स्थायी चिमनी अथवा बंगला ईट भट्ठा के निर्मित ईट	स्वामित्व - प्रति भट्ठा प्रति वर्ष देय स्वामित्व की राशि जो स्तंभ ४ में निर्धारित ईट की संख्या पर देय है (रूपये में)
१	२	३	४	५
१	I	पटना, मुजफ्फरपुर, भागलपुर, गया, दरभंगा जिलों का शहरी क्षेत्र	४५ लाख ईट	१३०५००/-रु०
२	II	अन्य शहरी क्षेत्र	३५ लाख ईट	१०१५००/-रु०
३	III	ग्रामीण क्षेत्र	२५ लाख ईट	७२५००/-रु०
४	IV	बंगला भट्ठा	१ (एक लाख) ईट	४३५०/-रु०

Cn

2- यह अधिसूचना निर्गत की तिथि से प्रवृत्त होगी ।

टिप्पणी I- समेकित स्वामिस्व का भुगतान दो किस्तों में किया जायेगा, यथा:-

- (i) प्रथम किस्त - कुल देय स्वामिस्व राशि का 50 प्रतिशत भट्ठा आरंभ करने के पूर्व, तथा
- (ii) द्वितीय किस्त :- कुल राशि का शेष 50 प्रतिशत 31 मार्च के पूर्व ।
- (iii) भट्टेदारों द्वारा कुल देय स्वामिस्व का भुगतान अगर एक मुस्त कर दिया जाता है तो कुल भुगतान स्वामिस्व पर 5 प्रतिशत की छूट दी जायेगी ।

टिप्पणी II- "शहरी क्षेत्र" से अभिप्रेत किसी नगर निगम या नगरपालिका या अधिसूचित क्षेत्र समिति की स्थानीय सीमा के भीतर के क्षेत्रों से है और, यथास्थिति, उस नगर निगम या नगरपालिका या अधिसूचित क्षेत्र समिति की सीमा रेखा से चार किलोमीटर की बाहरी दूरी की भीतर पड़ने वाले क्षेत्र भी इसमें शामिल हैं ।

टिप्पणी III- अव्यवसायिक, व्यक्तिगत उपयोग हेतु बंगला भट्ठा में निर्मित ईट / ईट मिट्टी पर कोई स्वामिस्व भुगतान नहीं होगा ।

4/बी0मु020-22/09

बिहार राज्यपाल के आदेश से,

*24.7/27.1.12*  
सरकार के संयुक्त सचिव ।

एस0ओ0सं0- 245/एम0, पटना, दिनांक- 27/1/12 का अंग्रेजी में निम्नलिखित अनुवाद बिहार राज्यपाल के प्राधिकार से इसके द्वारा प्रकाशित किया जाता है जिसे भारतीय संविधान के अनुच्छेद 348 के खण्ड (3) के अधीन अंग्रेजी भाषा में उसका प्राधिकृत पाठ समझा जायेगा ।

4/बी0मु020-22/09

बिहार राज्यपाल के आदेश से,

*24.7/27.1.12*  
सरकार के संयुक्त सचिव ।

S.O. No. 245/M, 27.1.12 In exercise of the powers conferred by rule 26(A) of the Bihar Minor Mineral Concession Rules, 1972 and having regard to position of Civil Construction, work position of Industrial Construction, position of situated population, position of Urbanisation and pace of industrial growth in different areas of the State, the Governor of Bihar is pleased to amend the previous notification S.O. No. 27 dated 24 March 2001 and reclassify such areas to determine the number of bricks per fixed kiln and Bangla Bhatta and consolidated amount of royalty to be paid thereon by brick kiln owner/brick earth remover per kiln per annum to the State Government for different areas as shown in the table below:-

*61*

## अधिसूचना

पटना, दिनांक 27/1/12

एस0 ओ0 सं0 50 एम0, खान एवं खनिज (विकास एवं विनियमन) अधिनियम, 1957 (अधिनियम सं0 67, 1957) की धारा-15 के द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए बिहार राज्यपाल बिहार लघु खनिज समनुदान नियमावली, 1972 के नियम 26 (1) (क) और (ख) की क्रमशः अनुसूची I एवं II में निम्नलिखित संशोधन करते हैं जो तुरत प्रवृत्त होगा :-

### संशोधन

उक्त नियमावली में,

- विद्यमान अनुसूची I, निम्नलिखित द्वारा प्रतिस्थापित की जायेगी, यथा:-

अनुसूची I

[ नियम 26 (1) (क) द्रष्टव्य ]

अनिवार्य लगान

अवधि	अनिवार्य लगान की दर (रूपये में)
1	2
पट्टा की सम्पूर्ण अवधि के लिए प्रति वर्ष की दर	30,000 रु0 प्रति एकड़ प्रति वर्ष

- विद्यमान अनुसूची II निम्नलिखित द्वारा प्रतिस्थापित की जायेगी :-

अनुसूची II

[ नियम 26 (1) (ख) द्रष्टव्य ]

स्वामिस्व (रॉयल्टी)

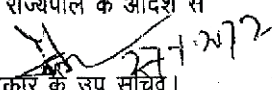
क्रम संख्या	खनिज का नाम	प्रति घन मीटर दर (रूपये में)
1	2	3
1	(क) किसी भी नाम से यथा परिभाषित बोल्टडर, ग्रेवेल शिंगिल अथवा पत्थर (ख) नीलामी द्वारा बंदोबस्त पत्थर	100=00  नीलामी की दशा में नीलामी की राशि
2	(क) निर्माण प्रयोजनों में व्यवहृत साधारण बालू (ख) नीलाम घाटों का साधारण बालू	50=00  नीलामी की दशा में नीलामी की राशि
3	ईंट बनाने की मिट्टी (400 मानक ईंट के समतुल्य)	11=60 (एस0 ओ0 सं0 244, दिनांक 27-01-12 द्वारा प्रख्यापित)
4	साधारण मिट्टी-मिट्टी जिसका उपयोग रानीगंज खपड़ा, वाणिज्यिक कार्यों, यथा बांध, सड़क, भवन आदि के निर्माण या उसे समतल करने अथवा अन्य वाणिज्यिक कार्यों के लिए किया जाता हो।	22=00

Cn

5	निर्माण सामग्री के रूप में व्यवहृत चूने के विनिर्माण के लिए भट्ठे में काम आनेवाला लाईम शेल, चूना पत्थर और कंकड़ तथा बटन के विनिर्माण में व्यवहृत लाईम शेल।	110=00
6	मोरम	55=00
7	केवल गोला मिल (बॉल मिल) के प्रयोजनार्थ व्यवहृत केल्सेडोनी गुटिका (पेबल)।	73=00
8	कंकड़युक्त पहाड़ी मिट्टी (ग्रेडुलर अर्थ)	55=00
9	भवन निर्माण के प्रयोजनार्थ या सड़क बनाने के काम में आनेवाला क्वार्टजाईट	73=00
10	रेह मिट्टी	26=00
11	शोरा (साल्ट पीटर)	29=00
12	स्लेट और शेल जब उनका उपयोग भवन निर्माण सामग्री के रूप में किया जाय	73=00
13	मुल्तानी मिट्टी (फुलर्स अर्थ)	95=00
14	चक्की (ग्राइन्डिंग) पत्थर सहित घरेलू बर्तन बनाने के काम में आनेवाला पत्थर	36=00
15	प्रति सैकड़ा स्टोन सेट्स तथा पत्थर ईंट (स्टोन ब्रिक्स)	73=00
16	पत्थर चूर्ण (स्टोन डस्ट)	विक्रय मूल्य की 10 प्रतिशत राशि
17	ग्रेनाईट (सजावट पत्थर के रूप में उपयोग होने पर) प्रति सैकड़ा (i) 60 से 0 मी 0 से अधिक के ब्लॉक के लिये । (ii) 60 से 0 मी 0 से कम के ब्लॉक के लिये ।	545=00 273=00
18	अन्य सभी खनिज	विक्रय मूल्य का 25 प्रतिशत राशि

टिप्पणी I बिहार लघु खनिज समानुदान नियमावली, 1972 या अन्यथा में किसी विरुद्ध बात के अन्तर्विष्ट होते हुए भी, नीलामी की राशि के समतुल्य से अधिक पत्थर का उत्खनन एवं प्रेषित किये जाने पर, बंदोबस्तधारी अधिक उत्खनित पत्थर की मात्रा के लिए अतिरिक्त स्वामिस्व (रॉयल्टी) का भुगतान करेगा।

टिप्पणी II नीलामी की राशि के समतुल्य बालू की मात्रा से अधिक बालू के निकाले जाने और प्रेषित किये जाने पर, बंदोबस्तधारी अधिक निकाले गए बालू की मात्रा के लिए अतिरिक्त स्वामिस्व (रॉयल्टी) का भुगतान करेगा।

12/वी0/मु0 70-2/03  
बिहार राज्यपाल के आदेश से  
  
सरकार के उप सचिव।

61

एस0ओ0 ..... 250 एम0 का अंग्रेजी में निम्नलिखित अनुवाद बिहार राज्यपाल के प्राधिकार से इसके द्वारा प्रकाशित किया जाता है जिसे भारतीय संविधान के अनुच्छेद 348 के खण्ड (3) के अधीन अंग्रेजी में उसका प्राधिकृत पाठ समझा जायेगा।

12/वी0/मु0 70-2/03

बिहार राज्यपाल के आदेश से

सरकार के उप सचिव।

S.O No. 250 /M, In exercise of the power conferred by Section 15 of the Mines & Mineral (Development and Regulation) Act, 1957 (Act no.67 of 1957), The Governor of Bihar is pleased to make the following amendment in schedule I & II of Rule 26(1) (a) & (b) respectively of Bihar Minor Mineral concession Rule, 1972 which shall come into force with immediate effect:-

#### AMENDMENTS

In the said Rules:-

- Existing schedule I shall be substituted by the following, namely:-

##### Schedule I

(sec Rule 26(1) (a))

##### Dead Rent

Period	Rate of dead rent (In Rs.)
1	2
Rate per year for entire period of lease	30,000 per acre per year

- Existing Schedule II shall be substituted by the following, namely:-

##### Schedule II

(sec Rule 26(1) (b))

##### Royalty

Sr.No.	Name of minerals	Rate per Cubic meter in Rupees.
1	2	3
1	(a) Boulder, Gravel, shingle or stone as defined by name whichever (b) Stone settled by way of auction	100=00 In case of auction the amount of auction
2	(a) Ordinary sand used for construction purpose (b) Ordinary sand of auctioned ghats	50=00 In case of auction the amount of auction
3	Brick earth (equivalent to 400 standard bricks)	11=60 (S.O. No. 244, Dated 27-01-12)
4	Ordinary clay- clay which is used for manufacturing of Rani ganj tiles, commercial works which is used for construction of embankment, Road, Building or levelling the same of used for other commercial orks.	22=00
5	Lime shell, Lime stone and kankar used in Kilns for manufacturing of lime used as construction material and Lime shall used for manufacture of bottoms.	110=00

Ln



6	Murram	55=00
7	Chalcedony Pebbles used for Boll Mill purpose only	73=00
8	Granduler earth	55=00
9	Quartzite used for the purpose of Building Construction or for making road.	73=00
10	Redd Mitti	26=00
11	Saltpetre	29=00
12	Slate and shell when used for making Building material	73=00
13	Fullers earth	95=00
14	Stone used for making household utensils including grinding stone	36=00
15	Stone sets and Stone Bricks Per hundred	73=00
16	Stone dust	10 Percent Amount of sale price .
17	Granite (In case of use for decorating stone) per hundred (i) Block more than 60 c.m (ii) Block less than 60 c.m	545=00 273=00
18	All other minerals	25 Percent of sale price

**Note :-** (I) Notwithstanding any thing contained repugnant in Bihar Minor Mineral Concession Rules, 1972 or otherwise, the settlee shall pay the extra Royalty for the excess quantity of extracted and dispatched stone more than the equivalent auction amount .

**Note :-** (II) The settlee shall pay the extra Royalty for the excess quantity of extracted and dispatched sand more than the equivalent auction amount.

12/B/MU 70-2/03

By the order of Governor of Bihar

Deputy Secretary to Government

ज्ञापक 12/बी०/मु० 70-2/03

२०० /एम०, दिनांक २४/११/१२

प्रतिलिपि: अवर सचिव, वित्त विभाग, बिहार, पटना को सी०डी० के साथ प्रेषित करते हुये उनसे अनुरोध है कि अधिसूचना की 500 प्रतियाँ बिहार राजपत्र (गजट) में प्रकाशित कराने हेतु राजकीय मुद्रणालय, गुलजार बाग, पटना को भेजी जाय तथा उसकी प्रतियाँ विभाग को उपलब्ध करायी जाय।

सरकार के उप सचिव।

ज्ञापक

२०० /एम०, दिनांक २४/११/१२

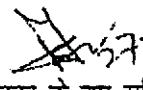
प्रतिलिपि: सभी प्रमण्ड्रीय आयुक्त/सभी जिला पदाधिकारी/अपर निदेशक/सभी उप निदेशक/सभी सहायक निदेशक, खान एवं भूतत्व विभाग/सभी खनिज विकास पदाधिकारी, खान एवं भूतत्व विभाग/सभी खान निरीक्षक, खान एवं भूतत्व विभाग को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

सरकार के उप सचिव।

ज्ञापक

२५० /एम०,दिनांक २४/४/१९

प्रतिलिपि: सचिव सह-विधि परामर्शी,विधि विभाग,बिहार/प्रधान सचिव,वित्त विभाग,बिहार/प्रधान सचिव,  
मंत्रिमंडल सचिवालय एवं समन्वय विभाग, बिहार, पटना को सूचनार्थ एवं प्रेषित।

 २५.४.२०१२  
सरकार के उप सचिव।

Ln

**अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव का कार्यालय,  
पथ निर्माण विभाग बिहार, पटना**

प्र.क्र.:- प्र.6/नियम-10/2008 **746(E)** पटना, दिनांक 25/2/2010

प्रेषक,

अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव  
पथ निर्माण विभाग, बिहार, पटना।

सेवा में,

सभी मुख्य अभियंता, पथ निर्माण विभाग।  
सभी अधीक्षण अभियंता, पथ निर्माण विभाग।  
सभी कार्यपालक अभियंता, पथ निर्माण विभाग।  
अधीक्षण अभियंता,  
मुख्यालय निरूपण अंचल।

**विषय:** बिहार भवन एवं अन्य सन्निर्माण कर्मकार कल्याण बोर्ड में प्रत्येक योजनाओं की लागत का एक प्रतिशत "सेस" के रूप में जमा करने के संबंध में।

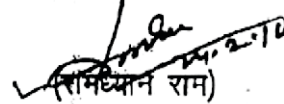
महाशय,

उपर्युक्त विषयक संयुक्त श्रमायुक्त-सह-सचिव, बिहार भवन एवं अन्य सन्निर्माण कर्मकार कल्याण बोर्ड, पटना के पत्र संख्या-बी0सी0डब्ल्यू0सी0-14/2008-श्र.स.-4984 दिनांक 01.10.08 (सानुलग्न प्रति संलग्न) से प्राप्त प्रस्ताव की समीक्षा विभागीय उच्चस्तरीय तकनीकी समिति द्वारा की गयी और समिति की अनुशंसा के आलोक में सरकार के निर्णयानुसार कहना है कि:-

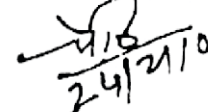
1) भवन तथा अन्य सन्निर्माण कर्मकार(नियोजन तथा सेवाशर्त विनियमन) अधिनियम, 1998 के निर्देशों के अनुपालनार्थ निर्माण कार्यों के संवेदक के विपत्रों से देय 1% (एक प्रतिशत) सेस के निमित्त निर्माण कार्य के प्राक्कलन में कार्य मूल्य का 1% (एक प्रतिशत) की दर से "सेस" की राशि जोड़कर प्राक्कलन का प्राबैधिक स्वीकृति अथवा प्रशासनिक स्वीकृति प्रदान की जाय तथा 1% सेस का भुगतान कल्याण बोर्ड को करना भी सुनिश्चित किया जाय।।

2) प्रस्ताव में महाधिवक्ता, बिहार तथा वित्त विभाग का परामर्श प्राप्त है।  
अनु0-यथोक्त।

विश्वासभाजन

  
(श्री राम)

अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव  
पथ निर्माण विभाग, बिहार, पटना।

  
25/2/10

कृप०उ०

ज्ञापांक: प्र.6/नियम-10/2008

पटना, दिनांक

प्रतिलिपि महालेखाकार बिहार, बीरचंद पटेल पथ, पटना को सूचना एवं आवश्यक कार्रवाई हेतु प्रेषित।

अभियंता प्रमुख-सह-अपर आयुक्त -सह-विशेष सचिव  
पथ निर्माण विभाग, बिहार, पटना।

ज्ञापांक: प्र.6/नियम-10/2008

पटना, दिनांक

प्रतिलिपि सभी प्रधान सचिव/सचिव, सभी विभाग/सभी प्रमंडलीय आयुक्त/सभी जिलाधिकारी/अभियंता प्रमुख, सभी कार्य विभाग/ अध्यक्ष, बिहार राज्य पुल निर्माण निगम, बिहार, पटना/ अध्यक्ष, बिहार राज्य पथ विकास निगम, बिहार, पटना को सूचना एवं आवश्यक कार्रवाई हेतु प्रेषित।

अभियंता प्रमुख-सह-अपर आयुक्त -सह-विशेष सचिव  
पथ निर्माण विभाग, बिहार, पटना।

ज्ञापांक: प्र.6/नियम-10/2008

पटना, दिनांक

प्रतिलिपि संयुक्त श्रमायुक्त-सह-सचिव, बिहार भवन एवं अन्य सन्निर्माण कर्मकार कल्याण बोर्ड, श्रम संसाधन विभाग, बिहार, पटना को सूचनार्थ समर्पित।

अभियंता प्रमुख-सह-अपर आयुक्त -सह-विशेष सचिव  
पथ निर्माण विभाग, बिहार, पटना।

संचिका सं०-बी०सी०डब्लू०सी०-14/2008, अ०सं०-4984  
बिहार सरकार  
श्रम संसाधन विभाग

प्रेषक,

राजेन्द्र प्रसाद मण्डल,  
संयुक्त श्रमायुक्त-सह-सचिव,  
बिहार भवन एवं अन्य सन्निमार्ण कर्मकार कल्याण बोर्ड, पटना ।

सेवा में,

~~विशेष~~  
अभियंता प्रमुख-सह-सचिव,  
पथ निर्माण विभाग, बिहार, पटना ।

पटना, दिनांक-01-10-08


विषय:- अर्द्ध सरकारी पत्र संख्या- बी०सी०डब्लू०सी० 01/2008-922, दिनांक-21.02.08  
की प्रति उपलब्ध कराने के संबंध में।

महाशय:

उपर्युक्त विषयांतर्गत आपके पत्र के आलोक में प्रधान सचिव, श्रम संसाधन विभाग के अर्द्धसरकारी पत्र सं०-बी०सी०डब्लू०सी०-01/2008-922, दिनांक-21.02.08 की प्रति एवं भारत सरकार के राजपत्र में प्रकाशित सेस संग्रह संबंधी अधिसूचना की प्रति संलग्न कर आपके आवश्यक कार्यार्थ भेजी जा रही है।

अनुलग्नक: यथोक्त।

विश्वासभाजन,

  
( राजेन्द्र प्रसाद मण्डल )  
संयुक्त श्रमायुक्त-सह-सचिव,  
बिहार भवन एवं अन्य सन्निमार्ण  
कर्मकार कल्याण बोर्ड, पटना ।

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Vyas Ji, IAS  
Principal Secretary

Phone : 491-612-2223855  
Fax : 491-612-2222704  
E-mail : vyas56@hotmail.com  
secy-lab-bihar@nic.in

बिहार सरकार  
श्रम संसाधन विभाग  
निकास भवन, पटना 800015, बिहार  
Government of Bihar  
Department of Labour Resources  
Nikas Bhawan, Patna - 800015, Bihar

अई सरकारी पत्र सं० एल.सी. इल्यू. सी. - ०१/२००८ दिनांक २२

पटना दिनांक २२/२/०८

प्रिय महाशय,

निर्माण श्रमिकों के संबंध में वर्ष 1996 से निम्नलिखित दो केन्द्रीय अधिनियम प्राम्त्वशील हैं :-

- (i) भवन तथा अन्य सन्निर्माण कर्मकार (नियोजन तथा सेवा शर्त विनियमन) अधिनियम, 1996 तथा
- (ii) भवन तथा अन्य सन्निर्माण कर्मकार कल्याण उपकार अधिनियम, 1998.

2. उक्त द्वितीय अधिनियम के तहत नियम भी केन्द्र सरकार द्वारा ही बनाया गया है, जबकि प्रथम अधिनियम के अन्तर्गत नियम बिहार सरकार द्वारा 7.9.2005 के असाधारण अंक राजपत्र में प्रकाशित किये भवन एवं अन्य सन्निर्माण कर्मकार कल्याण बोर्ड का गठन भी राज्य सरकार द्वारा दिनांक 18.2.08 की प्रकाशित अधिसूचना द्वारा कर दिया है।

3. उक्त द्वितीय अधिनियम के धारा 3 के तहत निर्माण कार्यों की लागत का एक प्रतिशत की दर से उपकर लिए जाने का प्रावधान किया गया है, जो उपरोक्त कल्याण बोर्ड को भेजा जाएगा। बोर्ड द्वारा इसका उपयोग निर्माण श्रमिकों के कल्याण की विभिन्न गतिविधियों के संचालन में किया जाएगा। (केन्द्र सरकार की अधिसूचना संलग्न)

4. निर्माण कार्य कराने वाले शासकीय विभागों, सार्वजनिक उपक्रमों, स्थानीय निकायों, संविधिक प्राधिकारियों के जानकारी के लिये यह स्पष्ट करना है कि बिहार भवन एवं अन्य सन्निर्माण कर्मकार (नियोजन तथा सेवा शर्त विनियमन) नियमावली, 2005 तथा कल्याण बोर्ड के गठन के साथ प्रदेश उक्त दोनों अधिनियमों के कार्यान्वयन किया जाना है। तदनुसार निवेदन है कि आपके विभाग तथा उसके अधीन आनेवाले सार्वजनिक उपक्रमों तथा संविधिक प्राधिकारियों (मुख्य ठेकेदार तथा ठेकेदार, यदि कोई हो) के तहत संचालित होने वाले निर्माण कार्यों में कृपया उक्त अधिनियमों / नियमों का पालन सूननिश्चित करने का कष्ट करें। इस संबंध में निम्नलिखित विन्दु ध्यान देने योग्य है :-

- (i) विभाग / सार्वजनिक उपक्रम / संविधिक प्राधिकारियों के कार्यों में निर्माण श्रमिकों को नियोजित करने वाले सभी ठेकेदार अपनी-अपनी स्थापनाओं को उक्त प्रथम अधिनियम की धारा -7 के तहत अविलम्ब पंजीकृत करा लें, और भविष्य में आरम्भ होने वाले सभी निर्माण कार्यों के मामले में भी इसी प्रकार का पंजीयन कराते रहें। इस प्रयोजन के लिए प्रदेश के सभी श्रम अधीक्षकों को पंजीयन पदाधिकारी नियुक्त किया गया है। बिहार भवन और अन्य सन्निर्माण कर्मकार (नियोजन तथा सेवा शर्त विनियमन) नियमावली, 2005 के नियम 27 के अनुसार निबंधन हेतु विहित शुल्क देय होगी।

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- (ii) प्रत्येक नवीन निर्माण कार्य आरंभ होने के न्यूनतम 30 दिन पूर्व नियोजक उक्त प्रथम अधिनियम की धारा 46 के तहत तदविषयक लिखित नोटिस संबंधित "निरीक्षक" को देय, और आरम्भ होने से अधिकतम 30 दिना में " उपकर निर्धारण अधिकारी " को भी विहित प्रपत्र में सूचना दें ।
- (iii) उक्त अधिनियम के अध्याय 6 एवं 7 तथा उसके तहत बने राज्य नियमावली के भाग 3 तथा 4 में निर्माण श्रमिकों की कार्य दशाओं और स्वास्थ्य तथा सुरक्षा के बारे में विस्तृत प्रावधानों का समुचित पालन हो ।
- (iv) आपके विभाग, अधीनस्थ सार्वजनिक उपक्रमों तथा सांविधिक प्राधिकारियों द्वारा निर्माण कार्यों के लिये भविष्य में जो निविदा प्रपत्र तथा अनुबंध के प्रारूप का उपयोग किया जाय । उनमें कंडिका 1 में उल्लेखित अधिनियमों के पालन की शर्तों का विशिष्ट उल्लेख कर दिया जाना उपयुक्त होगा ।

(v) महत्वपूर्ण

ऊपर कंडिका 1 में उल्लेखित द्वितीय अधिनियम ( भवन तथा अन्य सन्निर्माण कर्मकार कल्याण उपकर अधिनियम, 1996 ) के तहत निर्माण कार्यों पर देय उपकर की दर, भारत सरकार की अधिसूचना दिनांक 26.9.1996 द्वारा, निर्माण लागत का एक प्रतिशत निर्धारित किया गया है । इस अधिनियम के तहत बने केन्द्रीय नियमों के नियम 4 (3) के अनुसार शासकिय विभागों और सार्वजनिक उपक्रमों के निर्माण कार्यों पर लगाने वाला उपकर ऐसे विभागों / उपक्रमों द्वारा नियत दर से कार्य के लिये भुगतान किये गये बिलों से कटा जाना और इस प्रकार काटे जाने के 30 दिनों की अवधि में कल्याण बोर्ड को क्रॉसड डीमान्ड ड्राफ्ट द्वारा भेजा जाना अपेक्षित है ।

तदनुसार कृपया अपने विभाग और अधीनस्थ उपक्रमों के सभी संबंधित अधिकारियों को अविलम्ब निर्देश दे कि उनके अधीन चल रहे निर्माण कार्यों के लिये उपकर की राशि नियमित रूप से वसूल कर उसे निम्नलिखित पते पर भेजे ।

संयुक्त श्रमायुक्त सह सचिव,  
बिहार भवन एवं अन्य सन्निर्माण कर्मकार कल्याण बोर्ड,  
विकास भवन, नया सचिवालय, बेली रोड, पटना ।

5. मैं, अमारी हाऊगा यदि पत्र के प्रसंग में की गई कार्रवाई से आप मुझे अवगत करा दें और इसे विषय पर अधीनस्थ अधिकारियों, सार्वजनिक उपक्रमों तथा सांविधिक प्राधिकारियों को जारी निर्देशों की एक-एक प्रति मुझे तथा श्रमायुक्त सह अध्यक्ष, बिहार भवन एवं अन्य सन्निर्माण कर्मकार कल्याण बोर्ड, विकास भवन पटना को भेज देने की कृपा करें। इस पत्र के साथ निम्न सूचनाएँ संलग्न की जाती हैं ।

1. संलग्न अधिसूचना ।
2. कल्याण बोर्ड के संबंध में संक्षिप्त टिप्पणी
3. सेस संग्रह से संबंधित केन्द्र सरकार की अधिसूचना ।

भवदीय

( हस्ताक्षर )  
( नाम )

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## BASIC APPROACH AND GENERAL CONDITIONS AND ASSUMPTIONS FOR THE PREPARATION OF STANDARD DATA BOOK

The basic approach for the preparation of Standard Data Book for Analysis of Rates for Rural Roads is indicated as under:

### 1. Description of Items

The description of items is given briefly and linked with the relevant Sections and Clauses of the Ministry of Rural Development (MORD) Specifications for Rural Roads 2004 referred as Technical Specifications in the description of items, wherever feasible, which may be referred for detailed description, provisions and interpretation.

### 2. Use of Machinery

- 2.1. The Standard Data Book is based on the assumption that Rural Roads are to be constructed with intermediate technology, i.e., manual means with medium input of machinery, wherever required to ensure the required quality of work.
- 2.2. For rolling, use of static roller has been generally considered. However, use of vibratory/pneumatic tyre roller has been considered wherever required as per provisions of MORD Specifications.

### 3. Working Conditions

- 3.1. Rates have been analysed for average working conditions prevailing in the country.
- 3.2. Average achievable outputs of machinery and labour have been considered taking into account the job and management factors.
- 3.3. Since, the outputs of machinery and labour reduces substantially in hilly areas as the altitude increases, reduced outputs have been considered for hilly areas as indicated in the Preamble of Chapter 8.

### 4. Overheads

The overheads are considered as 10 per cent for items of road works, 20 per cent for items of bridge works and 15 per cent for items of protection works. This is assumed to include inter alia the following elements:

- i. Site accommodation, setting up plant, access road, water supply, electricity and general site arrangements.
- ii. Site office infrastructure.
- iii. Expenditure on:
  - (a) Corporate office of the Contractor
  - (b) Site supervision by the Contractor
  - (c) Preparation of "as built" drawings
- iv. Mobilisation/demobilisation of resources.
- v. Labour camps with minimum amenities, required as per labour laws.
- vi. Light vehicles for site supervision including administrative and managerial requirements.
- vii. Setting up of laboratories for quality control, field and laboratory testing for control of quality of various items of work and documentation of test results as per requirements of the MORD Specifications.
- viii. Minor Tools & Plants (T&P) including needle vibrators required for concrete work.
- ix. Survey instruments and the task of setting out of works including verification of line and dimensions (but excluding construction of benchmarks and reference pillars which are separate items under setting out).
- x. Taking of trial pits and bore holes, where required as per the MORD Specifications.
- xi. Watch and ward.
- xii. Arrangement for traffic and traffic management during construction.

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- xiii. Expenditure on safeguarding environment during construction.
- xiv. Sundries.
- xv. Financing expenditure of the Contractor.
- xvi. Work insurance/compensation.
- xvii. Sales/Turnover tax has been assumed at 4 per cent. In case this tax is more than 4 per cent, the percentage of overheads should be increased correspondingly for such States.

## 5. Contractor's Profit

Contractor's profit is considered @ 10 per cent uniformly and is added on Overheads also.

## 6. General

- 6.1. The Section and Clause numbers refer to the MORD Specifications for Rural Roads 2004.
- 6.2. Additional assumptions made for analysing different items have been indicated in respective Chapters in the form of Preamble and notes/footnotes wherever required.
- 6.3. For some of the items, certain size/specifications have been assumed. If size/specifications other than the same are adopted, corresponding modifications may be made in the inputs of analysis.
- 6.4. In the rate analysis of some items, the quantities of sub-items involved in that analysis, like, excavation for foundation, foundation concrete, masonry work, painting, lettering, etc. have been given. For rate analysis of such sub-items, reference may be made to relevant Chapters dealing with the sub-items.
- 6.5. The sources of all materials and samples of materials are required to be approved by the Engineer before start of any work.
- 6.6. For reinforcing steel both HYSD and TMT bars conforming to IS:1786 have been considered.
- 6.7. For pipe culverts both NP3 and NP4 pipes have been considered.
- 6.8. Quality control of works shall be governed by the relevant MORD Specifications.

## 7. Basic Inputs

- 7.1. The Standard Data Book is based on the requirements of basic inputs of materials, labour and machineries for various items.
- 7.2. The rates for labour, material and usage charges of machinery for the area where the project is located are to be ascertained from local authorities/enquiries to prepare SOR for the area.
- 7.3. The basic rates of materials, such as, stone boulders, stone for masonry, stone ballast (hand broken/machine broken), crushed aggregate, stone dust, moorum, gravel, lime, manure, sludge, quarry sweep, kankar, bricks, brick ballast, crushed slag, etc. at quarry/crusher sites shall be fixed by the respective States for various zones from time to time.
- 7.4. While preparing estimates/Detailed Notice Inviting Tender/Analysis of rates, only the basic rates fixed by respective States for concerned zones should be adopted.
- 7.5. The cost of materials should include the cost at source and the cost of their carriage upto the work site.
- 7.6. Although market rates for supply of aggregates at site are generally adopted for estimation purpose, rates for crushing of aggregates have also been analysed as most Contractors prefer to crush their own aggregates in case of larger sized projects. The cost of materials shall be evaluated considering the cost at crushing plants and its carriage upto the work site. These should be compared with rates for own crushing and carriage by the construction agency and lesser of the rates should be adopted for estimation purpose.

## 8. Plants and Equipment

- 8.1. Keeping in view the job and managerial factors and the age factor of machines, the output of plant and equipment is taken approximately 70 per cent of the rated capacity given by manufacturer under ideal conditions.

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# MISCELLANEOUS

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[Bihar Act 12, 2017]  
THE BIHAR GOODS AND SERVICES TAX ACT, 2017  
AN  
ACT

*to make a provision for levy and collection of tax on intra-State supply of goods or services or both by the State of Bihar and the matters connected therewith or incidental thereto*

BE it enacted by Legislature of Bihar in the Sixty-eighth Year of the Republic of India as follows:-

**CHAPTER I  
PRELIMINARY**

**1. Short title, extent and commencement.—**

- (1) This Act may be called the Bihar Goods and Services Tax Act, 2017.
- (2) It extends to the whole of the State of Bihar.
- (3) It shall come into force on such date as the State Government may, by notification in the Official Gazette, appoint:

Provided that different dates may be appointed for different provisions of this Act and any reference in any such provision to the commencement of this Act shall be construed as a reference to the coming into force of that provision.

**2. Definitions.—In this Act, unless the context otherwise requires :-**

- (1) “*actionable claim*” shall have the same meaning as assigned to it in section 3 of the Transfer of Property Act, 1882;
- (2) “*address of delivery*” means the address of the recipient of goods or services or both indicated on the tax invoice issued by a registered person for delivery of such goods or services or both;
- (3) “*address on record*” means the address of the recipient as available in the records of the supplier;
- (4) “*adjudicating authority*” means any authority, appointed or authorised to pass any order or decision under this Act, but does not include the Commissioner, Revisional Authority, the Authority for Advance Ruling, the Appellate Authority for Advance Ruling, the Appellate Authority and the Appellate Tribunal;
- (5) “*agent*” means a person, including a factor, broker, commission agent, *arhatia*, *del credere* agent, an auctioneer or any other mercantile agent, by whatever name called, who carries on the business of supply or receipt of goods or services or both on behalf of another;
- (6) “*aggregate turnover*” means the aggregate value of all taxable supplies (excluding the value of inward supplies on which tax is payable by a person on reverse charge basis), exempt supplies, exports of goods or services or both and inter-State supplies of persons having the same Permanent Account Number, to be computed on all India basis but excludes central tax, State tax, Union territory tax, integrated tax and cess;
- (7) “*agriculturist*” means an individual or a Hindu Undivided Family who undertakes cultivation of land—
  - (a) by own labour, or
  - (b) by the labour of family, or
  - (c) by servants on wages payable in cash or kind or by hired labour under personal supervision or the personal supervision of any member of the family;
- (8) “*Appellate Authority*” means an authority appointed or authorised to hear appeals as referred to in section 107;
- (9) “*Appellate Tribunal*” means the Goods and Services Tax Appellate Tribunal constituted under section 109;



**SCHEDULE III**

[See section 7]

**ACTIVITIES OR TRANSACTIONS WHICH SHALL BE TREATED NEITHER AS A  
SUPPLY OF GOODS NOR A SUPPLY OF SERVICES**

1. Services by an employee to the employer in the course of or in relation to his employment.
2. Services by any court or Tribunal established under any law for the time being in force.
3. (a) the functions performed by the Members of Parliament, Members of State Legislature, Members of Panchayats, Members of Municipalities and Members of other local authorities;
- (b) the duties performed by any person who holds any post in pursuance of the provisions of the Constitution in that capacity; or
- (c) the duties performed by any person as a Chairperson or a Member or a Director in a body established by the Central Government or a State Government or local authority and who is not deemed as an employee before the commencement of this clause.
4. Services of funeral, burial, crematorium or mortuary including transportation of the deceased.
5. Sale of land and, subject to clause (b) of paragraph 5 of Schedule II, sale of building.
6. Actionable claims, other than lottery, betting and gambling.

**Explanation.—For the purposes of paragraph 2, the term “court” includes District Court, High Court and Supreme Court.**

By Order of the Governor of Bihar,  
SURENDRA PRASAD SHARMA,  
Secretary to the Government.

अधीक्षक, सचिवालय मुद्रणालय,  
बिहार, पटना द्वारा प्रकाशित एवं मुद्रित।  
बिहार गजट (असाधारण) 377-571+400-डी0टी0पी0।  
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# बिहार गजट

## असाधारण अंक

### बिहार सरकार द्वारा प्रकाशित

10 भाद्र 1939 (श10)

(सं0 पटना 783) पटना, शुक्रवार, 1 सितम्बर 2017

वाणिज्य-कर विभाग

अधिसूचना

1 सितम्बर 2017

एस० ओ० 141 दिनांक 1 सितम्बर 2017—बिहार माल और सेवा कर अधिनियम, 2017 (2017 का बिहार अधिनियम 12) की धारा 164 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए बिहार-राज्यपाल, बिहार माल और सेवा कर नियमावली, 2017 का संशोधन करने के लिए निम्नलिखित नियमावली बनाते हैं :-

- (1) यह नियमावली बिहार माल और सेवा कर (द्वितीय संशोधन) नियमावली, 2017 कही जा सकेगी।  
(2) अन्यथा उपबंधित के सिवाय, ये दिनांक 27 जुलाई, 2017 के प्रभाव से प्रवृत्त होंगे।
- बिहार माल और सेवा कर नियमावली, 2017 में,—
  - दिनांक 22 जुलाई, 2017 के प्रभाव से, नियम 24 के उपनियम (4) में, “नियत तारीख से तीस दिन की अवधि के भीतर” शब्दों के स्थान पर, “30 सितंबर, 2017 को या उससे पूर्व” अंक और शब्द रखे जाएंगे ;
  - नियम 34 निम्नलिखित द्वारा प्रतिस्थापित किया जाएगा, यथा :-

“34. मूल्य के अवधारण के लिए भारतीय रुपए से भिन्न मुद्रा के विनिमय की दर—

- कराधेय माल के मूल्य का अवधारण करने के लिए विनिमय की दर अधिनियम की धारा 12 के निबंधनों में ऐसे मालों की पूर्ति के समय की तारीख के लिए सीमा शुल्क अधिनियम, 1962 की धारा 14 के अधीन बोर्ड द्वारा यथा अधिसूचित विनिमय की लागू दर होगी।
- कराधेय सेवाओं के मूल्य का अवधारण करने के लिए विनिमय की दर अधिनियम की धारा 13 के निबंधनों में ऐसी सेवाओं की पूर्ति के समय की तारीख को साधारणतया स्वीकृत लेखांकन सिद्धांतों के अनुसार अवधारित लागू विनिमय दर होगी।”;

- (iii) दिनांक 1 जुलाई, 2017 के प्रभाव से, नियम 44 के उपनियम (2) और उपनियम (3) निम्नलिखित द्वारा प्रतिस्थापित किये जाएंगे, यथा :-  
 “(2) उपनियम (1) में यथाविनिर्दिष्ट रकम का केन्द्रीय कर, राज्य कर, संघ राज्यक्षेत्र कर और एकीकृत कर के इनपुट कर प्रत्यय के लिए अवधारण पृथक्कृत किया जाएगा।  
 (3) जहां स्टॉक में रखे गए इनपुट से संबंधित कर बीजक उपलब्ध नहीं हैं, वहां रजिस्ट्रीकृत व्यक्ति, यथास्थिति, धारा 18 की उपधारा (4) या धारा 29 की उपधारा (5) में विनिर्दिष्ट घटनाओं में से किसी घटना के होने की प्रभावी तारीख को मालों की विद्यमान बाजार कीमत के आधार पर उपनियम (1) के अधीन रकम का आकलन करेगा।”;
- (iv) नियम 46 का तीसरा परंतुक निम्नलिखित परंतुक द्वारा प्रतिस्थापित किया जाएगा, यथा :-  
 “परंतु यह भी कि माल या सेवाओं के निर्यात की दशा में बीजक पर, यथास्थिति, “निर्यात/एसईजेड इकाई या एसईजेड विकासकर्ता को एकीकृत कर के संदाय पर प्राधिकृत प्रचालनों के लिए पूर्ति” या “निर्यात/एसईजेड इकाई या एसईजेड विकासकर्ता को एकीकृत कर का संदाय किए बिना बंधपत्र या वचनबंध के अधीन प्राधिकृत प्रचालनों के लिए पूर्ति” का पृष्ठांकन होगा और खंड (ड.) में विनिर्दिष्ट ब्यौरों के स्थान पर निम्नलिखित ब्यौरे अंतर्विष्ट होंगे, यथा :-  
 (i) प्राप्तिकर्ता का नाम और पता ;  
 (ii) परिदान का पता ; और  
 (iii) गंतव्य देश का नाम :”;
- (v) दिनांक 1 जुलाई, 2017 के प्रभाव से, नियम 61 का उपनियम (5) निम्नलिखित उपनियमों द्वारा प्रतिस्थापित किया जाएगा, यथा :-  
 “(5) जहां धारा 37 के अधीन प्ररूप जीएसटीआर-1 और धारा 38 के अधीन प्ररूप जीएसटीआर-2 में ब्यौरे प्रस्तुत करने के लिए समय-सीमा का विस्तार किया गया है और ऐसी परिस्थितियां हैं, तो आयुक्त अधिसूचना द्वारा विनिर्दिष्ट कर सकेगा कि रिटर्न इलेक्ट्रानिक रूप में प्ररूप जीएसटीआर-3ख में सामान्य पोर्टल के माध्यम से या तो सीधे या आयुक्त द्वारा अधिसूचित किसी सुविधा केंद्र के माध्यम से प्रस्तुत किया जाएगा।  
 (6) जहां प्ररूप जीएसटीआर-3ख में कोई रिटर्न प्ररूप जीएसटीआर-2 में ब्यौरे प्रस्तुत करने की सम्यक् तारीख के पश्चात् प्रस्तुत किया जाता है—  
 (क) प्ररूप जीएसटीआर-3 में रिटर्न का भाग-क प्ररूप जीएसटीआर-1, प्ररूप जीएसटीआर-2 के माध्यम से प्रस्तुत सूचना के और पूर्ववर्ती कर अवधियों के अन्य दायित्वों के आधार पर इलेक्ट्रानिकी रूप से सृजित किया जाएगा तथा उक्त रिटर्न का भाग-ख कर अवधि के संबंध में प्रस्तुत प्ररूप जीएसटीआर - 3ख के आधार पर इलेक्ट्रानिकी रूप से सृजित किया जाएगा;  
 (ख) रजिस्ट्रीकृत व्यक्ति प्ररूप जीएसटीआर - 3ख में रिटर्न और प्ररूप जीएसटीआर - 3 में रिटर्न के बीच विसंगतियों, यदि कोई हों, के आधार पर प्ररूप जीएसटीआर - 3 में रिटर्न भाग-ख को उपांतरित करेगा और अपने कर दायित्वों, यदि कोई हों, का निर्वहन करेगा ;  
 (ग) जहां प्ररूप जीएसटीआर - 3 में कर प्रत्यय की रकम प्ररूप जीएसटीआर - 3(ख) के निबंधनों में इनपुट कर प्रत्यय की रकम से अधिक हो जाती है तो अतिरिक्त रकम का रजिस्ट्रीकृत व्यक्ति की इलेक्ट्रानिक प्रत्यय बही में प्रत्यय किया जाएगा।”;
- (vi) दिनांक 1 जुलाई, 2017 के प्रभाव से, नियम 83 के उपनियम (3) के दूसरे परंतुक में, शब्द “उपधारा” शब्द “उपनियम” द्वारा प्रतिस्थापित किया जाएगा।
- (vii) दिनांक 1 जुलाई, 2017 के प्रभाव से, नियम 89 के उपनियम (4) के खंड (ड.) में, शब्द “उपधारा” शब्द “खंड” द्वारा प्रतिस्थापित किया जाएगा।
- (viii) दिनांक 1 जुलाई, 2017 के प्रभाव से, प्ररूप जीएसटी टीआरएन - 1 में क्रम सं. 7 में, सारणी (क) में स्तंभ (2) का शीर्ष “यथा लागू एचएसएन” द्वारा प्रतिस्थापित किया जाएगा ;
- (ix) दिनांक 1 जुलाई, 2017 के प्रभाव से, प्ररूप जीएसटी टीआरएन - 2 में क्रम सं. 4 और 5 में, सारणी में स्तंभ (1) का शीर्ष “यथा लागू एचएसएन” द्वारा प्रतिस्थापित किया जाएगा ;

[(सं० बिक्री-कर/जी0एस0टी0/विविध-10/2017-3237)]

बिहार-राज्यपाल के आदेश से,

सुजाता चतुर्वेदी,

वाणिज्य-कर आयुक्त-सह-प्रधान सचिव।

**1 सितम्बर 2017**

एस० ओ० 142, एस० ओ० 141 दिनांक 1 सितम्बर 2017 का अंग्रेजी में निम्नलिखित अनुवाद बिहार-राज्यपाल के प्राधिकार से इसके द्वारा प्रकाशित किया जाता है, जो भारतीय संविधान के अनुच्छेद 348 के खंड (3) के अधीन अंग्रेजी भाषा में उसका प्राधिकृत पाठ समझा जायेगा।

[(सं० बिक्री-कर/जी०एस०टी०/विविध-10/2017-3237)]

बिहार-राज्यपाल के आदेश से,

सुजाता चतुर्वेदी,

वाणिज्य-कर आयुक्त-सह-प्रधान सचिव।

***The 1<sup>st</sup> September 2017***

S.O.141 dated 1<sup>st</sup> September 2017— In exercise of the powers conferred by section 164 of the Bihar Goods and Services Tax Act, 2017 (12 of 2017), the Governor of Bihar is pleased to make the following Rules further to amend the Bihar Goods and Services Tax Rules, 2017,:-

1. (1) These rules may be called the Bihar Goods and Services Tax (Second Amendment) Rules, 2017.

(2) Save as otherwise provided, these shall come into force with effect from 27<sup>th</sup> July, 2017.

2. In the Bihar Goods and Services Tax Rules, 2017,

(i) With effect from 22nd July, 2017, in sub-rule (4), of rule 24, for the words “within a period of thirty days from the appointed day”, shall be substituted by the words and figures “on or before 30th September, 2017.”

(ii) Rule 34, shall be substituted, by the following namely:-

**“34. Rate of exchange of currency, other than Indian rupees, for determination of value.—**

(1) The rate of exchange for determination of value of taxable goods shall be the applicable rate of exchange as notified by the Board under section 14 of the Customs Act, 1962 for the date of time of supply of such goods in terms of section 12 of the Act.

(2) The rate of exchange for determination of value of taxable services shall be the applicable rate of exchange determined as per the generally accepted accounting principles for the date of time of supply of such services in terms of section 13 of the Act.”;

(iii) With effect from 1st July, 2017, sub-rules (2) and (3), of rule 44, shall be substituted by the following namely:—

“(2) The amount, as specified in sub-rule (1) shall be determined separately for input tax credit of central tax, State tax, Union territory tax and integrated tax.

(3) Where the tax invoices related to the inputs held in stock are not available, the registered person shall estimate the amount under sub-rule (1) based on the prevailing market price of the goods on the effective date of the occurrence of any of the events specified in sub-section (4) of section 18 or, as the case may be, sub-section (5) of section 29.”;

(iv) The third proviso, of rule 46, shall be substituted by the following proviso namely:—

“Provided also that in the case of the export of goods or services, the invoice shall carry an endorsement “SUPPLY MEANT FOR EXPORT/SUPPLY TO SEZ UNIT OR SEZ DEVELOPER FOR AUTHORISED OPERATIONS ON PAYMENT OF INTEGRATED TAX” or “SUPPLY MEANT FOR EXPORT/SUPPLY TO SEZ UNIT OR SEZ DEVELOPER FOR AUTHORISED OPERATIONS UNDER BOND OR LETTER OF UNDERTAKING WITHOUT PAYMENT OF INTEGRATED TAX”, as the case may be, and shall, in lieu of the details specified in clause (e), contain the following details, namely,-

(i) name and address of the recipient;



- (ii) address of delivery; and  
(iii) name of the country of destination.”;
- (v) With effect from 1st July, 2017, sub-rule (5) of rule 61 shall be substituted by the following namely:-
- “(5) Where the time limit for furnishing of details in FORM GSTR-1 under section 37 and in FORM GSTR-2 under section 38 has been extended and the circumstances so warrant, the Commissioner may, by notification, specify that return shall be furnished in FORM GSTR-3B electronically through the common portal, either directly or through a Facilitation Centre notified by the Commissioner.
- (6) Where a return in FORM GSTR-3B has been furnished, after the due date for furnishing of details in FORM GSTR-2—
- (a) Part A of the return in FORM GSTR-3 shall be electronically generated on the basis of information furnished through FORM GSTR-1, FORM GSTR-2 and based on other liabilities of preceding tax periods and PART B of the said return shall be electronically generated on the basis of the return in FORM GSTR-3B furnished in respect of the tax period;
- (b) the registered person shall modify Part B of the return in FORM GSTR-3 based on the discrepancies, if any, between the return in FORM GSTR-3B and the return in FORM GSTR-3 and discharge his tax and other liabilities, if any;
- (c) where the amount of input tax credit in FORM GSTR-3 exceeds the amount of input tax credit in terms of FORM GSTR-3B, the additional amount shall be credited to the electronic credit ledger of the registered person.”;
- (vi) With effect from 1st July, 2017, in the second proviso of sub-rule (3) of Rule 83, the words “sub-section” shall be substituted by the words “sub-rule”;
- (vii) With effect from 1st July, 2017, in clause (E) of sub-rule (4) of Rule 89, the words “sub-section” shall be substituted by the word “clause”;
- (viii) In FORM GST TRAN-1, with effect from 1st July, 2017, in Sl. No. 7, in Table (a), the heading of column (2) shall be substituted by the heading “HSN as applicable”;
- (ix) In FORM GST TRAN-2, with effect from 1st July, 2017, in Sl. No. 4 and 5, in the Table, the heading of column (1) shall be substituted by the heading “HSN as applicable”.

[(No. Bikri-kar/GST/Vividh-10/2017-3237 )]

By order of Governor of Bihar,  
SUJATA CHATURVEDI,  
Commissioner-cum-Principal Secretary  
Commercial Taxes Department.

अधीक्षक, सचिवालय मुद्रणालय,  
बिहार, पटना द्वारा प्रकाशित एवं मुद्रित,  
बिहार गजट (असाधारण) 783+571+10-डी0टी0पी0।  
Website: <http://egazette.bih.nic.in>

[TO BE PUBLISHED IN THE GAZZETE OF INDIA, EXTRAORDINARY, PART II,  
SECTION 3, SUB-SECTION (i)]

Government of India  
Ministry of Finance  
(Department of Revenue)

**Notification No. 20/2017-Central Tax (Rate)**

New Delhi, the 22<sup>nd</sup> August, 2017

G.S.R.....(E).- In exercise of the powers conferred by sub-section (1) of section 9, sub-section (1) of section 11, sub-section (5) of section 15 and sub-section (1) of section 16 of the Central Goods and Services Tax Act, 2017 (12 of 2017), the Central Government, on the recommendations of the Council, and on being satisfied that it is necessary in the public interest so to do, hereby makes the following amendments in the notification of the Government of India, in the Ministry of Finance (Department of Revenue), No. 11/2017- Central Tax (Rate), dated the 28<sup>th</sup> June, 2017, published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (i), *vide* number G.S.R. 690(E), dated the 28<sup>th</sup> June, 2017, namely:-

In the said notification, in the Table,-

(i) against serial number 3, for item (iii) in column (3) and the entries relating thereto in columns (3), (4) and (5), the following shall be substituted, namely:-

(3)	(4)	(5)
“(iii) Composite supply of works contract as defined in clause (119) of section 2 of the Central Goods and Services Tax Act, 2017, supplied to the Government, a local authority or a Governmental authority by way of construction, erection, commissioning, installation, completion, fitting out, repair, maintenance, renovation, or alteration of, - (a) a historical monument, archaeological site or remains of national importance, archaeological excavation, or antiquity specified under the Ancient Monuments and Archaeological Sites and Remains Act, 1958 (24 of 1958); (b) canal, dam or other irrigation works; (c) pipeline, conduit or plant for (i) water supply (ii) water treatment, or (iii) sewerage treatment or disposal.	6	-
(iv) Composite supply of works contract as defined in clause (119) of section 2 of the Central Goods and	6	-

<p>Services Tax Act, 2017, supplied by way of construction, erection, commissioning, installation, completion, fitting out, repair, maintenance, renovation, or alteration of,-</p> <ul style="list-style-type: none"> <li>(a) a road, bridge, tunnel, or terminal for road transportation for use by general public;</li> <li>(b) a civil structure or any other original works pertaining to a scheme under Jawaharlal Nehru National Urban Renewal Mission or Rajiv Awaas Yojana;</li> <li>(c) a civil structure or any other original works pertaining to the “In-situ rehabilitation of existing slum dwellers using land as a resource through private participation” under the Housing for All (Urban) Mission/Pradhan Mantri Awas Yojana, only for existing slum dwellers;</li> <li>(d) a civil structure or any other original works pertaining to the “Beneficiary led individual house construction / enhancement” under the Housing for All (Urban) Mission/Pradhan Mantri Awas Yojana;</li> <li>(e) a pollution control or effluent treatment plant, except located as a part of a factory; or</li> <li>(f) a structure meant for funeral, burial or cremation of deceased.</li> </ul>		
<p>(v) Composite supply of works contract as defined in clause (119) of section 2 of the Central Goods and Services Tax Act, 2017, supplied by way of construction, erection, commissioning, or installation of original works pertaining to,-</p> <ul style="list-style-type: none"> <li>(a) railways, excluding monorail and metro;</li> <li>(b) a single residential unit otherwise than as a part of a residential complex;</li> <li>(c) low-cost houses up to a carpet area of 60 square metres per house in a housing project approved by competent authority empowered under the 'Scheme of Affordable Housing in Partnership' framed by the Ministry of Housing and Urban Poverty Alleviation, Government of India;</li> <li>(d) low cost houses up to a carpet area of 60 square metres per house in a housing project approved</li> </ul>	6	-



<p>by the competent authority under-</p> <p>(1) the “Affordable Housing in Partnership” component of the Housing for All (Urban) Mission/Pradhan Mantri Awas Yojana;</p> <p>(2) any housing scheme of a State Government;</p> <p>(e) post-harvest storage infrastructure for agricultural produce including a cold storage for such purposes; or</p> <p>(f) mechanised food grain handling system, machinery or equipment for units processing agricultural produce as food stuff excluding alcoholic beverages.</p>		
(vi) Construction services other than (i), (ii), (iii), (iv) and (v) above.	9	-”;

(ii) against serial number 8, for item (vi) in column (3) and the entries relating thereto in columns (3), (4) and (5), the following shall be substituted, namely:-

(3)	(4)	(5)
“(vi) Transport of passengers by motorcab where the cost of fuel is included in the consideration charged from the service recipient.	2.5	Provided that credit of input tax charged on goods and services used in supplying the service has not been taken [Please refer to <i>Explanation</i> no. (iv)]
	or	
	6	-”;

(iii) against serial number 9, for item (iii) in column (3) and the entries relating thereto in columns (3), (4) and (5), the following shall be substituted, namely:-

(3)	(4)	(5)
“(iii) Services of goods transport agency (GTA) in relation to transportation of goods (including used	2.5	Provided that credit of input tax charged

household goods for personal use). <i>Explanation.-</i> “goods transport agency” means any person who provides service in relation to transport of goods by road and issues consignment note, by whatever name called.		on goods and services used in supplying the service has not been taken [Please refer to <i>Explanation</i> no. (iv)]
	or	
	6	Provided that the goods transport agency opting to pay central tax @ 6% under this entry shall, thenceforth, be liable to pay central tax @ 6% on all the services of GTA supplied by it.”;

(iv) against serial number 10, for item (i) in column (3) and the entries relating thereto in columns (3), (4) and (5), the following shall be substituted, namely:-

(3)	(4)	(5)
“(i) Renting of motorcab where the cost of fuel is included in the consideration charged from the service recipient.	2.5	Provided that credit of input tax charged on goods and services used in supplying the service has not been taken [Please refer to <i>Explanation</i> no. (iv)]
	or	
	6	-”;

(v) against serial number 11, for item (i) in column (3) and the entries relating thereto in columns (3), (4) and (5), the following shall be substituted, namely:-

(3)	(4)	(5)
“(i) Services of goods transport agency (GTA) in relation to transportation of goods (including used household goods for personal use). <i>Explanation.-</i> “goods transport agency” means any person who provides service in relation to transport of goods by road and issues consignment note, by whatever name called.	2.5	Provided that credit of input tax charged on goods and services used in supplying the service has not been taken [Please refer to <i>Explanation</i> no. (iv)]
	or	
	6	Provided that the goods transport agency opting to pay central tax @ 6% under this entry shall, thenceforth, be liable to pay central tax @ 6% on all the services of GTA supplied by it.”;

(vi) against serial number 26,-

(a) in column (3), in item (i),-

(A) for sub-item (b), the following sub-item shall be substituted, namely:-

“(b) Textiles and textile products falling under Chapter 50 to 63 in the First Schedule to the Customs Tariff Act, 1975 (51 of 1975);”;

(B) the *Explanation* shall be omitted;

(b) for item (ii) in column (3) and the entries relating thereto in columns (3), (4) and (5), the following shall be substituted, namely:-

(3)	(4)	(5)
“(ii) Services by way of any treatment or process on goods belonging to another person, in relation to- (a) printing of newspapers; (b) printing of books (including Braille books), journals and periodicals.	2.5	-

(iii) Manufacturing services on physical inputs (goods) owned by others, other than (i) and (ii) above.	9	-”;
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(vii) for serial number 27 and the entries relating thereto, the following shall be substituted, namely:-

(1)	(2)	(3)	(4)	(5)
“27	<b>Heading 9989</b>	(i) Services by way of printing of newspapers, books (including Braille books), journals and periodicals, where only content is supplied by the publisher and the physical inputs including paper used for printing belong to the printer.	6	-
		(ii) Other manufacturing services; publishing, printing and reproduction services; materials recovery services, other than (i) above.	9	-”;

(viii) against serial number 34, in column (3), in item (i), after the word “drama”, the words “or planetarium” shall be inserted.

[F. No.354/173/2017 -TRU]

(Ruchi Bisht)  
Under Secretary to the Government of India

Note:-The principal notification was published in the Gazette of India, Extraordinary, *vide* notification No. 11/2017 - Central Tax (Rate), dated the 28<sup>th</sup> June, 2017, *vide* number G.S.R. 690 (E), dated the 28<sup>th</sup> June, 2017.

No. RW/G-20017/26/2018-W&A  
Government of India  
Ministry of Road Transport & Highways  
(Planning zone)  
Transport Bhawan, 1, Parliament Street, New Delhi - 110001

Dated, the 19<sup>th</sup> November, 2018.

To

1. The Chief Secretaries of all State Governments/ UTs
2. The Chairman, National Highways Authority of India (NHAI), G-5&6, Sector-10, Dwarka, New Delhi- 110075
3. Director General (Border Roads), Seema Sadak Bhawan, 4- Parliament Street, New Delhi - 110001
4. The Managing Director, NHIDCL, 3rd Floor, PTI Building, 4- Parliament Street, New Delhi - 110 001
5. The Principal Secretaries/ Secretaries of all States/ UTs Public Works Departments dealing with National Highways, Other Centrally Sponsored Schemes & State Schemes
6. The Engineers-in-Chief and Chief Engineers of all States/ UTs Public works Departments dealing with National Highways, Other Centrally Sponsored Schemes
7. All CE-ROs/ SE-ROs/ ELOs of the Ministry of RT&H

**Subject: Implementation of CGST Act, 2017 - Standard Operating Procedure - Reg.**

**References: -**

- (i) Ministry's O.M. No. RT-23018/53/2017-T, dated 25.04.2018
- (ii) Ministry's O.M. No. RW/NH-34066/20/2018-S&R (P&B), dated 01.08.2018
- (iii) Ministry of Finance (Dept. of Revenue) Circular No. 65/39/2018 - DOR (Letter No. S.31011/11/2018-ST-I-DoR, dated 14.09.2018)

Sir,

Kind attention is drawn to the Ministry's O.M.s under ref. (i) and (ii) above regarding GST Implementation at Project sites/ offices levels. The Ministry of Finance issued detailed guidelines vide Circular under ref. (iii) above for deductions and deposits of TDS under GST by the DDO, copy of which is enclosed herewith for ready reference and for ensuring needful compliance.

2. Further, this is in continuation to the Ministry's policy and guidelines issued vide the reference on above mentioned subject.

3. The CST Act, 2017 has subsumed various indirect taxes of both Central and State Governments, such as Central Excise Duty, Service Tax, Central Sales Tax (CST)/ Works Contract Tax (WCT)/ State Value Added Tax (VAT), Additional Custom duty and Special Additional Duty (SAD) apart from Entry Tax and Octroi charges, etc.

4. Keeping in view the difficulties faced and feedback received so far, it has been decided with the approval of Competent Authority to follow the Standard Operating Procedure (SOP) given below henceforth and until further orders.

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RCD/SOR\_14<sup>th</sup> Edition\_April 2019



No. RW/G-20017/26/2018-W&A  
Government of India  
Ministry of Road Transport & Highways  
(Planning zone)  
Transport Bhawan, 1, Parliament Street, New Delhi - 110001

**5. Incidence of application of Service Tax/ GST**

Incidence of the applicability of taxes shall be as follows:-

Sr. No.	Completion of Service	Invoice Date	Payment Date	Applicability of Taxes			Applicable TDS
				Service Tax	Works Contract Tax (WCT)	GST	
1	Before June 30, 2017	Before June 30, 2017	Before June 30, 2017	Yes	Yes	No	WCT TDS
2	Before June 30, 2017	Before June 30, 2017	After June 30, 2017	Yes	Yes	No	WCT TDS
3	Before June 30, 2017	After June 30, 2017	After June 30, 2017	No	No	Yes	GST TDS
4	After June 30, 2017	After June 30, 2017	After June 30, 2017	No	No	Yes	GST TDS

**6. Payments for EPC Contracts**

6.1. The contract price is quoted lump-sum and inclusive of all taxes in most of EPC contracts; these taxes have now been subsumed under GST. In order to arrive at the incidence of application of Service Tax/GST as mentioned at Para 5 above, the total work shall be categorized as follows: -

- (i) Works completed up to 30.06.2017 and Billing completed by 30.06.2017.
- (ii) Works completed up to 30.06.2017 and Billing not completed by 30.06.2017.
- (iii) Works yet to be completed as on 01.07.2017.

6.2. GST Act, 2017 shall be applicable for all the works mentioned above at (ii) & (iii). Following procedure may be adopted by the Ministry/ ROs/ PIUs/ various Executing Agencies while making payments as per the provisions in the contracts:-

- (i) The project components under different major heads (like Earth, Sand, Aggregates, Steel, Cement, Bitumen etc.) are to be intimated by the contractor and checked/confirmed by the respective IE/ AE in consultation with the concerned RO/ PD for each of the Project.
- (ii) In order to compile the above information, an indicative Excel format is suggested for guidance and attached (at Annexure-I). It indicates various project components which attract various types of taxes including Excise Duty, CST, VAT/WCT and other taxes, which were already included in the contract price as per the original contract. The same format can be used to compile the information for each ongoing project, taking into consideration the GST Input Tax Credit available for the project. The project components and rates shown are only indicative and should be modified as per the project actuals and shall be certified by the statutory auditors of the

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(Planning zone)  
Transport Bhawan, 1, Parliament Street, New Delhi - 110001

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Contractor/Developer/Company. In case, appointment of Statutory Auditor is not mandatory, then it can be certified by a Practicing Chartered Accountant.

- (iii) After completion of the said exercise, the costs against the subsumed taxes (Excise duty, CST, VAT/ WCT etc.) in the particular contract are to be finalized and to be mutually agreed by IE/ AE/ Ministry / concerned Executive Agency/ Contractor. The cost of subsumed taxes factored in the contract value is required to be reduced from the original contract price to arrive at the actual balance cost of the project.
- (iv) Based on such certification and mutual agreement, the concerned RO/ PD shall either pay or recover the net impact of the GST after accounting for subsumed tax component and input tax (GST) credit. The contractor shall be responsible for correct declaration of GST liability and shall provide the supporting documents, if required.
- (v) This will be an interim arrangement till the completion of the project and the final impact of GST (positive or negative) shall be worked out at the time of Final bill.

**7. Preparation of DPR, Estimation of Project Cost, Cost of Utility Shifting and Change of Scope:**

For all the cost estimates, which are finalized prior to 01.07.2017, there is need to revise the estimated amount taking in to consideration the implication of GST. This includes Estimated Cost for Road projects, Cost involved in Utility Shifting and estimated amount for Change in Scope. While estimating the cost, various Schedule of Rates (SoR) are followed, which are approved prior to application of GST. In all such cases, pre-GST taxes should be excluded from the cost/ estimates and the applicable GST rate shall be shown separately/ and added in the cost/ estimate.

**8. Payments for Hybrid Annuity Projects (40% of Bid Project Cost), O&M Contracts and Bonus for Early completion:**

- (i) Keeping in view the clarifications issued by the Ministry of Finance (Deptt. of Revenue) vide notification no. 33/ 2017, dated 13.10.2017 on Integrated Tax (Rate) that "Service by way of access to a road or a bridge on payment of annuity - applicable GST is NIL (Sl. No. 24A, Heading 9967)", no payment against GST shall be made on Annuity payments.
- (ii) Interest is payable on the reducing balance of the completion cost as per the clause no. 23.6.4 of the MCA. GST shall not be payable on interest of payment of Annuity amount.
- (iii) GST is applicable on entire payment of Operation and Maintenance (O&M) cost as per clause 23.7 of MCA with 100% input Tax credit.

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Transport Bhawan, 1, Parliament Street, New Delhi - 110001

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- (iv) GST shall be payable on Bonus for early completion as per clause 23.5 of the MCA without any Input Tax Credit. However, if any input tax credit is availed by the Concessionaire, the benefit of such ITC shall be passed on to the Ministry/ concerned Executing Agency.

**9. Mobilization advance:**

Applicability of GST on mobilization advance shall be as follows -

- (i) If the mobilization advance is refundable as per the Contract Agreement, no GST shall be payable on mobilization advance.
- (ii) If the mobilization advance is recoverable as per the Contract Agreement in future bills, then GST shall be applicable. It shall be paid by the concerned executing agency/ RO/ PD at the applicable rates and shall be suitably adjusted at the time of recovery of the Mobilization Advance.

**10. Deductibility of TDS under Income Tax Act:**

- (i) TDS shall continue to be deducted under the Income Tax Act, in addition to the Tax Deducted at Source (TDS) applicable under WCT/GST. Accordingly, wherever in terms of agreement or contract, the component of "GST on Services" comprised in the amount payable is indicated separately, TDS under the Income Tax Act shall be deducted on the amount paid or payable without including such "GST on Services" component. GST for this purpose shall include IGST, CGST, SGST and / UTGST.
- (ii) For Example, if the bill is proposed for Rs. 118/- which includes Rs. 100/- as a value of service/ work done and includes Rs. 18/- towards the GST, TDS under the Income Tax Act shall be deducted on Rs. 100/- and not on Rs. 118/-, as per the applicable rate prescribed under the Income Tax Act.

11. The ROs of the Ministry are permitted to hire the services of Financial Consultants/ Chartered Accountants for activities related to tax deduction under GST, maintaining of register, filing of returns, generating TDS certificate through the GSTN portal, etc., within maximum allowable limit of Rs. 1,00,000/- per annum. The expenditure shall be booked out of funds earmarked from budget head 3451 Secretariat Economic Services (Major Head), 00.090 Secretariat (Minor Head), 11 Ministry of Road Transport and Highways, 11.01 Roads and Transport Wings, 11.01.13 Office Expenses, or its amendments as issued from time to time. ROs shall accordingly refer proposals from time to time to General Section of the Ministry for earmarking of needful allocation of funds. Hiring of such services should be as per Rule 177 of GFR, 2017.

12. If the amount required for such services is more than Rs. 1 lakh/ annum, in such cases prior approval of Ministry needs to be taken.

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13. Further, the ROs of the Ministry are also authorised to hire an Accountant on Contract Basis as per the terms and conditions stipulated vide the Ministry's "norms for setting up of new PMU/ PIU for the EPC projects of MoRT&H" circulated vide Office Order No. N-20011/28/2013-E.II, dated 12.08.2013 for providing assistance to the ROs subject to obtaining prior approval of the Ministry.

14. The RPAOs of the Ministry shall furnish the actual details of the expenditures incurred and deductions made to the ROs on weekly basis on every Monday.

15. It is requested that the contents of this letter may be brought into the notice of all concerned for needful compliance.

16. This issues with the concurrence of Finance Wing vide U.O.No. 1402/TF-II, dated 12.11.2018 and approval of Secretary (RT&H).

  
19.11.18

(Mohit Kumar)  
AEE (Planning)

[planningmorth@gmail.com](mailto:planningmorth@gmail.com)

Enclosure: As above

**Copy to:**

1. All JSs / CEs in the Ministry of Road Transport & Highways
2. All Technical Officers in the Ministry of Road Transport & Highways
3. All RPAOs of the Ministry
4. The Secretary General, Indian Road Congress
5. The Director, IAHE
6. Dy. FA / Controller of Accounts
7. Technical Circular file of S&R Section
8. NIC - for uploading on Ministry's website under "What's new"

**Copy for information and necessary action to:**

1. PPS to Secretary (RT&H)
2. Sr. PPS to DG (RD)&SS
3. PPS to Additional Secretary
4. PPS to AS&FA
5. PS to Pr.CCA
6. PS to ADG(Z-I) / ADG(Z-II) / ADG(Z-III) / ADG(IV) / ADG(V)

Project/ Contract details (EPC Contracts)							
Name of the Contractor/ Concessionaire	Contract Agreement Number		Name of the Project				
GST No.	Date	State	Bill No.	Date:			
2							
Payment Details							
a	b	c	d	e			
Gross Original Value of the Contract	Price variation upto 30.6.2017	Value of Services rendered upto 30.6.2017 as per original contract	Payments claimed upto 30.6.2017-original contract price	Payments claimed upto 30.6.2017-Price Variation			
99,000	1,000	64,350	45,000	750			
3							
Project Constituents	Percentage	Gross Original Value of the ContractTotal	Percentage	Pre-GST			
a Gross Value of Contract	-	99,000	-	64,350			
b Less : Margin	10%	9,000	10%	5,850			
c Cost of the Project(a-b)	-	90,000	-	58,500			
d Bitumen	17%	15,300	9%	5,000			
e Steel	8%	7,200	7%	4,000			
f Cement	5%	4,500	4%	2,500			
g Aggregates, Sand etc	16%	14,400	21%	12,000			
h Pipes	1%	900	1%	300			
i Oth. Materials	1%	900	1%	500			
j HSD	17%	15,300	22%	13,000			
k Labour	35%	31,500	36%	21,200			
	100%	90,000	100%	58,500			
4							
GST Implications (For balance work)	% Component	Value of Item in Cost	Excise duty %	VAT			
Cost of the Project(a-b)	-	-	-	-			
Bitumen	33%	6,110	21%	29%			
Steel	10%	2,565	10%	5%			
Cement	6%	1,618	6%	8%			
Aggregates, Sand etc	8%	2,222	0%	8%			
Pipes	2%	545	1%	8%			
Oth. Materials	1%	360	1%	2%			
HSD	7%	2,130	0%	8%			
Labour	33%	9,537	0%	8%			
Cost of the Project	100%	25,086	-	-			
5							
Billing Pattern							
Value of the work done by the Contract		34,650	Notes :				
Less : factored in Taxes (about)		6,414	1 The cells in Green are for input				
Adjusted Value of Work done		28,236	2 The correct rate of taxes for Excise,CST,VAT are to be entered.				
Add GST (on Adjusted value of work done which includes Profit Margin also)	12%	3,388	3 The rates for VAT/Output VAT are as may be applicable for respective states				
Amount Claimed		31,624	4 The issue of closing stocks are not considered due to complexities involved				
5 The Components & Taxes are indicative. It has to be project specific and may change							
Authority Engineer							
Contractor							
RO, MORTÉH							

*Mark*  
19.11.18

# TRUCK CAPACITY PER TRIP

VIDE T.E.C. LETTER No. 1115 DATED 12.07.85

Sr. No.	Materials	Truck Capacity per trip	Multi-plying factor	Net payable Volume or weight col.3 x col.4
1.	2.	3.	4.	5.
1.	Lime, Moorum and building rubbish	6.00 M <sup>3</sup>	1.00	6.00 M <sup>3</sup>
2.	Earth	6.00 M <sup>3</sup>	0.80	4.80 M <sup>3</sup>
3.	Manure or sludge	6.00 cum	0.92	5.52 cum
4.	Excavated rocks (120 Lbs)	6.00 cum	0.67	4.02 cum
5.	Stone Metal	5.40 cum	0.85	4.59 cum
6.	Soling stone	5.00 cum	0.85	4.25 cum
7.	Boulder (90 Lbs to 120 Lbs)	6.00 cum	0.80	4.80 cum
8.	Bricks	2000 Nos	1.00	2000 Nos.
9.	Tiles/Mangra/Mosaic	3200 Nos	1.00	3200 Nos.
10.	Brick tiles (300 x 150 x 50 mm)	1760 Nos	1.00	1760 Nos.
11.	Cement, Stone blocks, G.I, C.I, A.C. and C.C. Pipe below 100 mm dia and other heavy materials.	8.00 M.T.	1.00	8.00 M.T.
12.	Steel	8.00 M.T.	1.00	8.00 M.T.
13.	Timber	9.60 cum	1.00	9.60 cum
14.	Tar, Bitumen	8.00 M.T.	1.00	8.00 M.T.
15.	Steam coal	8.00 M.T.	1.00	8.00 M.T.
16.	S.W. pipe 60 cm. length			
	(i) 100 mm dia	800 No/480 M	1.00	800 No/480M
	(ii) 150 mm dia	400 No/240 M	1.00	400 No/240M
	(iii) 200 mm dia	224 No/134.40 M	1.00	224 No/134.4M
	(iv) 230 mm dia	176 No/105.60 M	1.00	176 No/105.6M
	(v) 250 mm dia	140 No/84 M	1.00	140 No/84 M
	(vi) 300 mm dia	112 No/67.20 M	1.00	112 No/67.2M
	(vii) 350 mm dia	80 No/48 M	1.00	80 No/48 M
	(viii) 400 mm dia	56 No/33.60 M	1.00	56 No/33.60 M
	(ix) 450 mm dia	44 No/26.40 M	1.00	44 No/26.40 M
	(x) 500 mm dia	40 No/24.00M	1.00	40No/24.00 M
	(xi) 600 mm dia	32 No/19.20M	1.00	32 No/19.20M
17.	R.C.C. pipe and A.C. pipe			
	(i) 100 mm dia	145No x 2M= 290M	1.00	290.00M
	(ii) 125 mm dia	100No x 2M= 200M	1.00	200.00M
	(iii) 150 mm dia	90No x 2M=180M	1.00	180.00M
	(iv) 200 mm dia	40No x 2.5M=100M	1.00	100.00M

*Cm*

1.	2.	3.	4.	5.
	(v) 250 mm dia	30No x 2.50M=75M	1.00	75.00M
	(vi) 300 mm dia	24No x 2.5M=60M	1.00	60.00M
	(vii) 350 mm dia	19No x 2.5M=47.5M	1.00	47.50M
	(viii) 400 mm dia & 450 mm dia	13No x 2.5M=32.5M	1.00	32.50M
	(ix) 500 mm dia & 600 mm dia	10No x 2.5M=25.0M	1.00	25.00M
	(x) 700 mm dia & 800 mm dia	6No x 2.5M=15M	1.00	15.00M
	(xi) 900 mm dia & 1100 mm dia	4No x 2.5M=10M	1.00	10.00M
	(x) 1100 mm dia & 1200 mm dia	3No x 2.5M=7.5M	1.00	7.50M
18.	G.I. crates 1 x 1.5 x 0.75 M	80 No.	1.00	80 No.
19.	Bamboos			
	(i) 75 mm dia & 100 mm dia	280 No.	1.00	280 No.
	(ii) 50 mm dia & 75 mm dia	300 No.	1.00	300 No.
20.	Empty bags of cement	3000 nos.	1.00	3000 nos.
21.	Sal bullah Av. 6 M length			
	(i) 100 mm dia	125 Nos.	1.00	125 Nos.
	(ii) 125 mm dia	80 Nos.	1.00	80 Nos.
	(iii) 150 mm dia	60 Nos.	1.00	60 Nos.
	(iv) 175 mm dia	45 Nos.	1.00	45 Nos.
	(v) 200 mm dia	25 Nos.	1.00	25 Nos.
	(vi) 225 mm dia	20 Nos.	1.00	20 Nos.
22.	Stone chips sand and Fly Ash 5.00 cum		5.4 cum	0.924
23.	Steel and C.I. Pipe 3.66 M			
	(i) 100 mm dia	80No x 3.66M=292.80M	1.00	292.8M
	(ii) 125 mm dia	60No x 3.66M=219.60M	1.00	219.60M
	(iii) 150 mm dia	50No x 3.66M=183.00M	1.00	183.00M
	(iv) 200 mm dia	30No x 3.66M=109.80M	1.00	109.80M
	(v) 250 mm dia	22No x 3.66M= 80.52M	1.00	80.52M
	(vi) 300 mm dia	17No x 3.66M= 62.22M	1.00	62.22M
	(vii) 350 mm dia	12No x 3.66M= 43.92M	1.00	43.92M
	(viii) 400 mm dia	9No x 3.66M= 32.94M	1.00	32.94M
	(ix) 500 mm dia	7No x 3.66M= 25.62M	1.00	25.62M
	(x) 600 mm dia	5No x 3.66M= 18.30M	1.00	18.30M

Ln

## **Important Points to be Noted**

1. The rate analysis of chapter 12 to 15 have been framed on 21% Overhead Charges for Major Bridages including State of Art Bridges & Minor Bridges. When the rate of chapter 12 to 15 have to be used for Minor Bridges included in the road package it must be converted into 16% Overhead Chagres by multiplying 0.959 to the basic rate of chapter 12 to 15.
2. The rate analysis of Road Works have been framed on 6% Overhead Charges up to cost ₹50.00 Crores. When the cost is above ₹50.00 Crores, it must be converted into 4% Overhead Charges by multiplying 0.981 to the basis rates of Road Works.
3. The materials rate of Patna Civil Division have been taken into analysis (in case of 100A Brick, Patna Urban), if the rate of other Civil Division is provided, in that case the difference of cost of materials with proper Overhead & CP must be calculated by addition or subtraction as required in the basis SOR. In Schedule-MI I for Bricks, Royalty has been included @ Rs 29.00 Per 1000 Nos bricks for Sr. No. 1-4 and @ Rs 11.6 Per CUM for Sr. No. 5-7.
4. The maximum lead to be considered as per T.E.C. norms is as follows :-
  - (i) For local sand 3 Km including 1 Km on Kuchcha road.
  - (ii) For brick 8 Km including 1 Km kuchcha road.
  - (iii) For coarse sand, stone metals, stone chips, stone boulder, bitumen as per actual lead without provision of kuchcha lead as per requirement of site condition.
5. It is advised to users to read the concerned specification and detail rate analysis carefully before using the rates as this Rate of Analysis is based on the recent development in technology in the field of Highway Construction.
6. In chapter-I (Carriage of Materials), Contractor's profit (10%) and Overhead charges (6%) have been included in the rate analysis.



## **ABBREVIATIONS**

mm	Millimetre
cm	Centimetre
m	Metre
km	Kilometre
Sqm	Square metre
Ha	Hectare
Sq. km	Square Kilometre
cum	Cubic metre
l	Litre
kl	Kilolitre
kg	Kilogram
q	quintal
t	tonne
t.km	tonne kilometer
MoRT&H	Ministry of Road Transport and Highways
IS	Indian Standard
IRC	Indian Roads Congress
T&P	Tools and Plants
GI	Galvanised Iron
CI	Cast Iron
RCC	Reinforced Cement Concrete
PCC	Plain Cement Concrete
GL	Ground Level
₹	Indian Rupees
Dia	Diameter
Min	Minimum
Max	Maximum
No.	Number
hr	Hour
i.e.	That is
eg	For example
WBM	Water Bound Macadam
BM	Bituminous Macadam
SDBC	Semi-Dense Bituminous Concrete
BC	Bituminous Concrete
F E loader	Front end Loader
OMC	Optimum Moisture Content
L	Lead in Kilometre
HMP	Hot Mix Plant
RR	Road Roller
WMM	Wet Mix Macadam

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# **PART - A**

# **ROAD WORK**

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## A. Road Works

# Basic Approach and General conditions for the preparation of Standard Data Book

The basic approach for the preparation of Standard Data Book for Road Works is indicated as under :

### Description of items

1. The description of items is given briefly and linked with the relevant clause of the MoRT&H Specifications for Road and Bridge Works, which may be referred for detailed description, provisions and interpretation.

2. **Mechanical Means**

Due to mechanization of construction work, rate analysis for various items has been prepared using mechanical means. However, manual means have also been provided for certain cases, where areas may be inaccessible for machines or quantum of work may not be large enough to justify use of machines.

3. **Overhead Charges**

The overhead charges include the following elements :

- i. Site accommodation, setting up plant, access road, water supply, electricity and general site arrangements.
- ii. Office furniture, equipment and communications.
- iii. Expenditure on
  - a). Corporate office of contractor
  - b). Site supervision
  - c). Documentation and “as built” drawings
- iv. Mobilisation/de-mobilisation of resources
- v. Labour camps with minimum amenities and transportation to work sites
- vi. Light vehicles for site supervision including administrative and managerial requirements
- vii. Laboratory equipment and quality control including field and laboratory testing
- viii. Minor T&P and survey instruments and setting out work, including verification of line, dimensions, trial pits and bore holes, where required
- ix. Watch and ward
- x. Traffic management during construction
- xi. Expenditure on safeguarding environment
- xii. Sundries
- xiii. Financing Expenditure
- xiv. Sales/Turn over tax
- xv. Work Insurance/compensation.

- 3.1** For the purpose of calculation of Overhead charges, the projects are categorized into 2 types as under and Overhead charges, provided as indicated against each.

**Category 1** : Cost up to ₹50 crores                      10 Per cent

**Category 2** : Cost above ₹50 crores                      8 Per cent

**4. Contractor's Profit**    10 per cent of cost of works

Contractor's profit is also added on overhead charges.

**5. Basic Inputs**

Basic Inputs are only given in the standard data book. The rates for material and labour are to be obtained from local authorities for the area where the project is located.

**6. Plants and Equipment**

- 6.1** A dozer is proposed for excavation where cutting and filling for the roadway is within 100m for longer leads, a combination of hydraulic excavator and tipper is proposed.
- 6.2** Keeping in view the job and managerial factors and the age factor of machines, the output of plant equipment is taken approximately 70 per cent of the rated capacity given by manufacture under ideal conditions.
- 6.3** It has been assumed that a water tanker would make one trip per hour on an average. Water charges have not been included for items where the requirement is very nominal. It is assumed that the same would be covered under sundries.
- 6.4** Output of plant/equipment is considered for the compacted quantities.
- 6.5** The usage charges for machines include ownership charges, cost of repair and maintenance including replacement of tyres and running and operating charges which includes crew, fuel and lubricants.

**7. Materials**

- 7.1** Quantities of materials given in the rate analysis are approximate for the purpose of estimating and include normal wastages. Actual consumption would have to be based on mix design.
- 7.2** The rates of material should include basic cost at locations of stone crushers, loading, unloading, cost of carriage and stacking at plant sites as the case may be.

*Chas.*  
12/8/19

**7.3** The alternative proposal for crushing own aggregate by installing crusher should be compared with procurement of crushed aggregates from the market and proposal found economical may be adopted.

**7.4** The specifications of materials shall be governed by section 1000 of MoRT&H Specifications for Road and Bridge Works.

## **8. Labour**

**8.1** The labour wages should be as per rates fixed by state government.

**8.2** One mate has been provided for 25 labours.

**8.3** Skilled labour includes mason, carpenter, blacksmith, mechanics and other trades.

## **9. Carriage of Materials**

**9.1** The unit for vehicle for carriage has been taken as under.

- a) In hours where lead is defined including time required for loading and unloading.
- b) In tonne- km where lead is variable. The loading and unloading for such cases have been provided separately.

**9.2** Where the quantity of material to be transported is small such as dismantled materials and the same are required to be loaded manually, provision of tractor-trolley has been made instead of tipper.

## **10. General**

**10.1** The clause numbers refer to MoRT&H Specifications for Road and Bridge Works.

**10.2** Assumptions made have been indicated in respective chapter in the form of notes, where required.

**10.3** Sundries to cater for unforeseen contingency and miscellaneous items have been added in the overhead charges.

**10.4** Arrangement for traffic during construction shall be as per Clause 112 of MoRT&H Specifications for Road and Bridge Works.

**10.5** The supply of materials will be taken either at the location of mixing plant or at the work site as the case may be.

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**10.6** Contractor will make his own arrangements for borrowing earth. However, compensation for earth taken from private land has been included in the rate analysis for construction of embankment with borrowed earth.

**10.7** The requirement of machinery has been worked out assuming effective working period of 6 hours per shift of 8 hours.

**10.8** The cost of earthwork in urban roads will be comparatively higher due to following reasons :-

- a) There is mixed traffic on urban roads like slow moving hand and animal driven carts, rickshaws, cycles, two/three wheeler apart from the usual vehicular traffic resulting into traffic jams. This causes loss of working time which may be in the range of 10-15 per cent.
- b) There is considerable disruption of traffic adversely affecting the efficiency of the working parties including machines due to congestion caused by pedestrian traffic, local road side vendors, parking of vehicles by the road side, encroachments by the shopkeepers and local shops who make use of the berms of the road in front of these shops and unauthorized conversion of road berms into mini local market. The output of manpower and machines is substantially reduced due to factors mentioned above.
- c) Cost of living in urban areas is comparatively more resulting into higher wages.
- d) At times, work is executed during night time due to heavy traffic during day time. This involves extra expenditure by way of making arrangement for lighting and special transport for working parties due to odd hour.

In the light of above, the authorities engaged in preparing the cost estimates may exercise their judgment and cater for the additional cost to the extent of 2 to 3 per cent, keeping in view the severity of factors mentioned above. Support details for the extra cost based on actual site conditions in specific cases will have to be given in justification.

## **10.9 Credit for Dismantled Material**

The dismantled materials should be examined and a realistic assessment made for the credit for such materials, which can be utilized for works or auctioned.

**10.10** In the rate analysis of some items, the quantities of sub-items involved in that analysis like excavation for foundation, foundation concrete, painting, lettering etc. have been given. The rates for such items may be taken from relevant chapters where the same have already been analysed.

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12/3/19

- 10.11** The source of material and samples are required to be approved by the Engineer before start of any work.
- 10.12** The rates of items include cost of testing of soil, materials and works.
- 10.13** The use of surface by construction vehicles shall be governed by Clause 119 of MoRT&H Specifications.
- 10.14** The contractor shall arrange to provide and maintain an adequate equipped field laboratory as per Clause 121.
- 10.15** Quality Control of works shall be governed by Section 900 of MoRT&H Specifications.
- 10.16** The various activities of works shall also be documented by photographs and video cassettes as per Clauses 125 & 126 of MoRT&H Specifications.
- 10.17** The classification of soil shall be as per Clause 301.2 of MoRT&H Specifications.
- 10.18** The earth excavated from foundations has been considered to be backfilled and balance utilized locally for road work except in the case of marshy soil.
- 10.19** The rate analysis for removal of unsuitable soil does not provide for replacement by suitable soil which will have to be paid separately.
- 10.20** Items for hilly terrain have been analysed separately.
- 10.21** 10 per cent extra cement may be provided for concreting under water, where required.
- 10.22** Grade of cement may be adopted as per mix design.
- 10.23** Quantities of cement in various grades of cement concrete have been taken as per IRC: 21- 2000 and IRC: 18-2000.
- 10.24** The rates for rigid, semi-rigid and flexible crash barriers have been analysed in Chapter-8.
- 10.25** The coarse and fine aggregates shall conform to IS: 383.
- 10.26** Certain equipments like road rollers are required to be available at site for complete period of the shift, though from the consideration of their output, they may be required only for 3 to 4 hours. This is necessitated to match with the output of other associated machines like HMP,

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12/3/19



Pavers etc. In such cases, the hire charges of road rollers have been multiplied with a factor of 0.65 to account for the idle period.

- 10.27** For pricing of RCC slab culverts, the items given in respective chapters in bridge section may be referred.
- 10.28** Wherever electric generator has not been provided to run a plant or equipment, it is assumed that it is fitted with a diesel engine.
- 10.29** Some of the firms in the field of construction chemicals have evolved new brands of chemicals for water proofing, sealing of cracks, cementing compounds etc. The market can be explored to meet such requirements.
- 10.30** Some of major steel producing firms have evolved thermo-mechanically treated steel which has enhanced strength, better corrosion resistance, ductility, weld ability and high temperature thermal resistance. Enquiries from these firms can be made on technical specifications and use of such products considered in works based on performance in works where these have already been used.
- 10.31** Provision of fly ash has been made in embankment construction, sub-base construction and in cement concrete pavement.
- 10.32** The Standard Data Book is for Department use only. It cannot be produced in Court of Law as reference/authority and thus is a privilege document.
- 10.33** In case it is decided to include the following items and their maintenance in the BOQ, the scope and specifications should be worked out and defined in a detailed manner in the tender document to avoid any dispute during execution.

MoRT&H Clause	Item
120	Site office and furniture for Engineer and his staff.
122	Site residential accommodation for Engineer and other supervisory staff.
124	Providing and maintaining vehicle for Engineer.

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12/8/19

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## **CHAPTER–1**

# **CARRIAGE OF MATERIALS**

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# Chapter – 1

## Carriage of Materials

### Preamble:

1. The provision of tipper has been made in hours where lead is known like disposal of the materials upto 1000m. In case where lead is variable like carriage of hot mix or concrete mix from plants or earth from borrow areas, provision has been made in terms of tonne-kilometer (t-km), which can be adopted as per actual conditions.
2. Provision has been made for a tractor trolley instead of tipper where dismantled materials of sorts or material having more volume as compared with weight are required to be transported. This arrangement will be economical.
3. The cost of carriage will vary depending upon the riding surface of the road. Provision has accordingly been made considering surface roads, unsurfaced graveled roads and katcha tracks.
4. Analysis for loading has been done both for manual and mechanical means for adoption as per actual situations.
5. Where loading is done by mechanical plant like HMP or batching plant and there is automatic loading in tippers, provision of loading and unloading has been made at rate of 10 per cent of cost of carriage to account for time taken by the tipper for getting loaded at the plant and un-loading in the paver or otherwise at site.
6. Although the market rates for supply of aggregates at site are generally taken for estimation purpose, rate for crushing of aggregate have also been analysed as most of the contractors prefer to crush their own aggregate in case of large projects exceeding ₹50 crores in value.
7. The cost of material shall be evaluated considering the cost at crushing plants and cost of carriage including loading and unloading or the rates for supply at site depending upon system being followed at particular locations. These rates should be compared with the rates for own crushing and carriage by the construction agency.

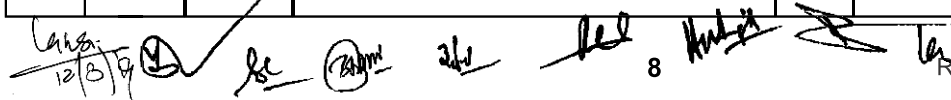
*Carriage*  
12/8/19



# Schedule :- CARRIAGE OF MATERIALS (By TIPPER)

Date: 26.02.19

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
1.1		<b>Loading and Unloading of Stone Boulder/ Stone aggregates/ Sand /Kanker/Moorum</b>	cum				
		Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip.					
		<b>Unit = cum</b>					
		<b>Taking output = 5.5 cum</b>					
		<b>Time required for</b>					
		i) Positioning of tipper at loading point		1 Min			
		ii) Loading by front end loader 1 cum bucket capacity @ 25 cum per hour		13 Min			
		iii) Maneuvering, reversing, dumping and turning for return		2 Min			
		iv) Waiting time, unforeseen contingencies etc		4 Min			
		<b>Total</b>		<b>20 Min</b>			
		<b>a) Machinery</b>					
		Tipper 5.5 tonnes capacity	hour	0.330	1018.00	335.94	P&M-048
		Front end-loader 1 cum bucket capacity @ 25 cum/hour	hour	0.330	1373.00	453.09	P&M-017
		<b>b) Overhead charges @ 0.06 on (a)</b>				47.34	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				83.64	
		Cost for 5.5 cum = a+b+c				920.01	
		<b>Rate per cum = (a+b+c)/ 5.5</b>				167.27	
	<b>Note</b>	<b>Unloading will be by tipping.</b>			<b>say</b>	<b>167.00</b>	
1.2		<b>Loading and Unloading of Boulders by Manual Means</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 5.5 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.110	272.00	29.92	L-12
		Mazdoor for loading and unloading	day	0.750	257.00	192.75	L-13
		<b>b) Machinery</b>					
		Tipper 5.5 tonne capacity	hour	0.750	1018.00	763.50	P&M-048
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				59.17	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				104.53	
		Cost for 5.5 cum = a+b+c+d				1149.87	
		<b>Rate per cum = (a+b+c+d)/5.5</b>				209.07	
	<b>Note</b>	<b>Unloading will be by tipping.</b>			<b>say</b>	<b>209.00</b>	
1.3		<b>Loading and Unloading of Cement or Steel by Manual Means and Stacking.</b>					
		<b>Unit = tonne</b>					
		<b>Taking output = 10 tonnes</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor for loading and unloading	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Truck 10 tonne capacity	hour	2.000	929.00	1858.00	P&M-057
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				143.63	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				253.74	
		Cost for 10 tonnes = a+b+c+d				2791.12	
		<b>Rate per tonnes = (a+b+c+d)/10</b>				279.11	
					<b>say</b>	<b>279.00</b>	
1.4		<b>Cost of Haulage Excluding Loading and Unloading</b>					
		Haulage of materials by tipper excluding cost of loading, unloading and stacking.					
		<b>Unit = t.km</b>					
		<b>Taking output 10 tonnes load and lead 10 km = 100 t.km</b>					
	(i)	<b>Surfaced Road</b>					
		Speed with load : 25 km / hour.					
		Speed while Returning empty :35 km / hour.					
		<b>a) Machinery.</b>					
		<b>Tipper 10 tonne capacity</b>					
		Time taken for onward haulage with load	hour	0.400	1018.00	407.20	P&M-048
		Time taken for empty return trip.	hour	0.290	1018.00	295.22	P&M-048
		<b>b) Overhead charges @ 0.06 on (a)</b>				42.15	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				74.46	
		cost for 100 t km = a+b+c				819.02	
		<b>Rate per t.km = (a+b+c)/100</b>				8.19	
					<b>say</b>	<b>8.20</b>	



# Schedule :- CARRIAGE OF MATERIALS (By TIPPER)

Date: 26.02.19

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
1.4	(ii)	<b>Unsurfaced Graveled Road</b>					
		Speed with load: 20 km / hour					
		Speed for empty return trip :30 km / hour					
		<b>a) Machinery</b>					
		<b>Tipper 10 tonnes capacity</b>					
		Time taken for onward haulage with load	hour	0.500	1018.00	509.00	P&M-048
		Time taken for empty return trip	hour	0.330	1018.00	335.94	P&M-048
		<b>b) Overhead charges @ 0.06 on (a)</b>				50.70	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				89.56	
		Cost for 100 t .km = a+b+c				985.20	
		Rate per t.Km = (a+b+c)/100				9.85	
					<b>say</b>	<b>9.90</b>	
1.4	(iii)	<b>Katcha Track and Track in River Bed/Nallah Bed and Choe Bed.</b>					
		Speed with load :10 km / hour					
		Speed while returning empty:15 km / hour					
		<b>a) Machinery</b>					
		<b>Tipper 10 tonnes capacity</b>					
		Time taken for onward haulage	hour	1.000	1018.00	1018.00	P&M-048
		Time taken for empty return trip	hour	0.670	1018.00	682.06	P&M-048
		<b>b) Overhead charges @ 0.06 on (a)</b>				102.00	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				180.21	
		Cost for 100 t .km = a+b+c				1982.27	
		Rate per t.Km = (a+b+c)/100				19.82	
					<b>say</b>	<b>19.80</b>	

26/2/19  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख भवन निर्माण विभाग, बिहार, पटना।

26/2/19  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, लघु जल संसाधन विभाग, बिहार, पटना।

26.2.19  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असैनिक), बिहार स्टेट पावर होल्डिंग कंपनी लि0, बिहार, पटना।

26/02/19  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (विद्युत), भवन निर्माण विभाग, बिहार, पटना।

26/02/19  
सदस्य,

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग, निगरानी विभाग, बिहार, पटना।

26.2.19  
सदस्य,

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

26/02/19  
सदस्य,

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख मुख्यालय, जल संसाधन विभाग, बिहार, पटना।

26/2/19  
संयोजक,

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-विशेष सचिव, पथ निर्माण विभाग, बिहार, पटना।



# Schedule :- CARRIAGE OF MATERIALS (By TRACTOR)

Date: 26.02.19

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
1.1		<b>Loading and Unloading of Stone Boulder/ Stone aggregates/Sand /Kanker/Moorum</b>	cum				
		Placing Tractor at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip					
		<b>Unit = cum</b>					
		<b>Taking output = 2.25 cum</b>					
		<b>Time required for</b>					
		i) Positioning of Tractor at loading point		1 Min			
		ii) Loading by front end loader 1 cum bucket capacity @ 25 cum per hour		5 Min			
		iii) Maneuvering, reversing, dumping and turning for return		0 Min			
		iv) Waiting time, unforeseen contingencies etc		0 Min			
		<b>Total</b>		<b>6 Min</b>			
		<b>a) Labour</b>					
		Mate	day	0.030	272.00	8.16	L-12
		Mazdoor for loading and unloading	day	0.720	257.00	185.04	L-13
		<b>b) Machinery</b>					
		Tractor 3.60 tonnes capacity	hour	0.100	521.00	52.10	
		Front end-loader 1 cum bucket capacity @ 25 cum/hour	hour	0.083	1373.00	113.96	P&M-017
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				21.56	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				38.08	
		Cost for 2.25 cum = a+b+c+d				418.90	
		<b>Rate per cum = (a+b+c+d)/ 2.25</b>				186.18	
	Note	<b>Unloading will be done manually.</b>			<b>say</b>	<b>186.00</b>	
1.2		<b>Loading and Unloading of Boulders by Manual Means</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 2.25 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.050	272.00	13.60	L-12
		Mazdoor for loading and unloading	day	0.310	257.00	79.67	L-13
		<b>b) Machinery</b>					
		Tractor 3.60 tonne capacity	hour	0.310	525.00	162.75	
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				15.36	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				27.14	
		Cost for 2.25 cum = a+b+c+d				298.52	
		<b>Rate per cum = (a+b+c+d)/2.25</b>				132.68	
	Note	<b>Unloading will be done manually.</b>			<b>say</b>	<b>133.00</b>	
1.3		<b>Loading and Unloading of Cement or Steel by Manual Means and Stacking.</b>					
		<b>Unit = tonne</b>					
		<b>Taking output = 3.60 tonnes</b>					
		<b>a) Labour</b>					
		Mate	day	0.030	272.00	8.16	L-12
		Mazdoor for loading and unloading	day	0.720	257.00	185.04	L-13
		<b>b) Machinery</b>					
		Tractor 3.60 tonne capacity	hour	0.720	525.00	378.00	
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				34.27	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				60.55	
		Cost for 3.60 tonnes = a+b+c+d				666.02	
		<b>Rate per tonnes = (a+b+c+d)/3.60</b>				185.01	
					<b>say</b>	<b>185.00</b>	
1.4		<b>Cost of Haulage Excluding Loading and Unloading</b>					
		Haulage of materials by Tractor excluding cost of loading, unloading and stacking.					
		<b>Unit = t.km</b>					
		<b>Taking output 3.60 tonnes load and lead 10 km = 36.0 t.km</b>					
	(i)	<b>Surfaced Road</b>					
		Speed with load : 15 km / hour.					
		Speed while Returning empty :25 km / hour.					
		<b>a) Machinery.</b>					
		Tractor 3.6 tonne capacity					


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**Schedule :- CARRIAGE OF MATERIALS (By TRACTOR)**


**Date: 26.02.19**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Time taken for onward haulage with load	hour	0.667	525.00	350.18	
		Time taken for empty return trip.	hour	0.400	525.00	210.00	
		<b>b) Overhead charges @ 0.06 on (a)</b>				33.61	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				59.38	
		cost for 36 t km = a+b+c				653.16	
		<b>Rate per t.km = (a+b+c)/36</b>				18.14	
					<b>say</b>	<b>18.10</b>	
<b>1.4</b>	<b>(ii)</b>	<b>Unsurfaced Graveled Road</b>					
		Speed with load: 12 km / hour					
		Speed for empty return trip :20 km / hour					
		<b>a) Machinery</b>					
		<b>Tractor 3.6 tonnes capacity</b>					
		Time taken for onward haulage with load	hour	0.833	525.00	437.33	
		Time taken for empty return trip	hour	0.500	525.00	262.50	
		<b>b) Overhead charges @ 0.06 on (a)</b>				41.99	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				74.18	
		Cost for 36 t .km = a+b+c				816.00	
		Rate per t.Km = (a+b+c)/36				22.67	
					<b>say</b>	<b>22.70</b>	
<b>1.4</b>	<b>(iii)</b>	<b>Katcha Track and Track in River Bed/Nallah Bed and Choe Bed.</b>					
		Speed with load :10 km / hour					
		Speed while returning empty:15 km / hour					
		<b>a) Machinery</b>					
		<b>Tractor 3.6 tonnes capacity</b>					
		Time taken for onward haulage	hour	1.000	525.00	525.00	
		Time taken for empty return trip	hour	0.667	525.00	350.18	
		<b>b) Overhead charges @ 0.06 on (a)</b>				52.51	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				92.77	
		Cost for 36 t .km = a+b+c				1020.45	
		<b>Rate per t.Km = (a+b+c)/36</b>				28.35	
					<b>say</b>	<b>28.30</b>	

**Note:-** वैसे स्थल जहाँ पर Truck एवं Tipper के द्वारा ढुलाई किया जाना संभव नहीं है तथा Tractor से ढुलाई economical हो केवल वैसे ही स्थलों के लिए Tractor से ढुलाई का प्रावधान किया जाय।

  
26/2/19  
सदस्य

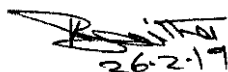
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समिति-सह-अभियंता प्रमुख  
भवन निर्माण विभाग, बिहार, पटना।

  
26/2/19  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना।

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
लघु जल संसाधन विभाग, बिहार, पटना।

  
26.2.19  
सदस्य

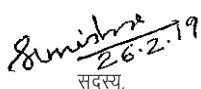
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समिति-सह-मुख्य अभियंता (असैनिक),  
बिहार स्टेट पावर होल्डिंग कंपनी लि0, बिहार,  
पटना।

  
26/02/19  
सदस्य

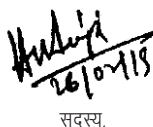
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-सह-मुख्य अभियंता (विद्युत),  
भवन निर्माण विभाग,  
बिहार, पटना।

  
26/02/19  
सदस्य

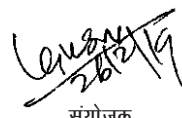
राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, तकनीकी परीक्षण  
कोषांग, निगरानी विभाग,  
बिहार, पटना।

  
26.2.19  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-अभियंता प्रमुख, लोक स्वास्थ्य  
अभियंत्रण विभाग, बिहार, पटना।

  
26/02/19  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, मुख्यालय,  
जल संसाधन विभाग, बिहार, पटना।

  
26/2/19  
संयोजक

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख-सह-अपर आयुक्त-सह-  
विशेष सचिव, पथ निर्माण विभाग, बिहार, पटना।

## Summary of Rate Analysis

## CHAPTER - 1

## CARRIAGE OF MATERIALS

Item No.	Description	Unit	Rate (₹)
1.1	<b>Loading and Unloading of Stone Boulder / Stone Aggregates / Sand / Kanker / Moorum.</b> (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip.)	cum	167.00
1.2	<b>Loading and Unloading of Boulders by Manual Means</b>	cum	209.00
1.3	<b>Loading and Unloading of Cement or Steel by Manual Means and Stacking.</b>	tonne	279.00
1.4	<b>Cost of Haulage Excluding Loading and Unloading</b>		
(i)	<b>Surfaced Road</b>	tonne.km	8.20
(ii)	<b>Unsurfaced Gravelled Road</b>	tonne.km	9.90
(iii)	<b>Katcha Track and Track in River Bed / Nallah Bed and Choe Bed.</b>	tonne.km	19.80
1.5	<b>Hand Broken Stone Aggregates 63 mm nominal size</b> (Supply of quarried stone, hand breaking into coarse aggregate 63 mm nominal size (passing 80 mm and retained on 50 mm sieve) and stacking as directed.)	cum	858.00
1.6	<b>Crushing of Stone Aggregates 13.2 mm nominal size.</b> (Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 13.2 mm nominal size.)	cum	850.00
1.7	<b>Crushing of Stone Aggregates 20 mm nominal size</b> (Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 20 mm nominal size.)	cum	722.00
1.8	<b>Crushing of Stone Aggregates 40 mm nominal size</b> (Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 40 mm nominal size.)	cum	609.00

Chg.  
12/8/19



## CHAPTER - 1 CARRIAGE OF MATERIALS

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks / Input ref.
1.1		<b>Loading and Unloading of Stone Boulder/ Stone aggregates/Sand/ Kanker/Moorum</b>	cum				
		Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip.					
		<b>Unit = cum</b>					
		<b>Taking output = 5.5 cum</b>					
		<b>Time required for</b>					
		i) Positioning of tipper at loading point		1 Min			
		ii) Loading by front end loader 1 cum bucket capacity @ 25 cum per hour		13 Min			
		iii) Maneuvering, reversing, dumping and turning for return		2 Min			
		iv) Waiting time, unforeseen contingencies etc.		4 Min			
		Total		<b>20 Min</b>			
		<b>a) Machinery</b>					
		Tipper 5.5 tonnes capacity	hour	0.330	1018.00	335.94	P&M-048
		Front end-loader 1 cum bucket capacity @ 25 cum/hour	hour	0.330	1373.00	453.09	P&M-017
		<b>b) Overhead charges @ 0.06 on (a)</b>				47.34	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				83.64	
		Cost for 5.5 cum = a+b+c				920.01	
		<b>Rate per cum = (a+b+c)/ 5.5</b>				167.27	
		<b>Note Unloading will be by tipping.</b>			<b>say</b>	<b>167.00</b>	
1.2		<b>Loading and Unloading of Boulders by Manual Means</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 5.5 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.110	272.00	29.92	L-12
		Mazdoor for loading and unloading	day	0.750	257.00	192.75	L-13
		<b>b) Machinery</b>					
		Tipper 5.5 tonne capacity	hour	0.750	1018.00	763.50	P&M-048
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				59.17	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				104.53	
		Cost for 5.5 cum = a+b+c+d				1149.87	
		<b>Rate per cum = (a+b+c+d)/5.5</b>				209.07	
		<b>Note Unloading will be by tipping.</b>			<b>say</b>	<b>209.00</b>	
1.3		<b>Loading and Unloading of Cement or Steel by Manual Means and Stacking.</b>					
		<b>Unit = tonne</b>					
		<b>Taking output = 10 tonnes</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor for loading and unloading	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Truck 10 tonne capacity	hour	2.000	929.00	1858.00	P&M-057
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				143.63	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				253.74	
		Cost for 10 tonnes = a+b+c+d				2791.12	
		<b>Rate per tonnes = (a+b+c+d)/10</b>				279.11	
					<b>say</b>	<b>279.00</b>	

Analysis of Rates  
**CARRIAGE OF MATERIALS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks / Input ref.
1.4		<b>Cost of Haulage Excluding Loading and Unloading</b>					
		Haulage of materials by tipper excluding cost of loading, unloading and stacking.					
		<b>Unit = t.km</b>					
		<b>Taking output 10 tonnes load and lead 10 km = 100 t.km</b>					
		<b>(i) Surfaced Road</b>					
		Speed with load : 25 km / hour.					
		Speed while Returning empty :35 km / hour.					
		<b>a) Machinery.</b>					
		<b>Tipper 10 tonne capacity</b>					
		Time taken for onward haulage with load	hour	0.400	1018.00	407.20	P&M-048
		Time taken for empty return trip.	hour	0.290	1018.00	295.22	P&M-048
		<b>b) Overhead charges @ 0.06 on (a)</b>				42.15	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				74.46	
		cost for 100 t km = a+b+c				819.02	
		<b>Rate per t.km = (a+b+c)/100</b>				8.19	
					<b>say</b>	<b>8.20</b>	
1.4		<b>(ii) Unsurfaced Graveled Road</b>					
		Speed with load: 20 km / hour					
		Speed for empty return trip :30 km / hour					
		<b>a) Machinery</b>					
		<b>Tipper 10 tonnes capacity</b>					
		Time taken for onward haulage with load	hour	0.500	1018.00	509.00	P&M-048
		Time taken for empty return trip	hour	0.330	1018.00	335.94	P&M-048
		<b>b) Overhead charges @ 0.06 on (a)</b>				50.70	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				89.56	
		Cost for 100 t.km = a+b+c				985.20	
		<b>Rate per t.Km = (a+b+c)/100</b>				9.85	
					<b>say</b>	<b>9.90</b>	
1.4		<b>(iii) Katcha Track and Track in River Bed/Nallah Bed and Choe Bed</b>					
		Speed with load :10 km / hour					
		Speed while returning empty:15 km / hour					
		<b>a) Machinery</b>					
		<b>Tipper 10 tonnes capacity</b>					
		Time taken for onward haulage	hour	1.000	1018.00	1018.00	P&M-048
		Time taken for empty return trip	hour	0.670	1018.00	682.06	P&M-048
		<b>b) Overhead charges @ 0.06 on (a)</b>				102.00	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				180.21	
		Cost for 100 t.km = a+b+c				1982.27	
		<b>Rate per t.Km = (a+b+c)/100</b>				19.82	
					<b>say</b>	<b>19.80</b>	

*Calc.*  
12/8/19

**CARRIAGE OF MATERIALS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks / Input ref.
1.5		<b>Hand Broken Stone Aggregates 63 mm Nominal Size</b>					
		Supply of quarried stone, hand breaking into coarse aggregate 63 mm nominal size (passing 80 mm and retained on 50 mm sieve) and stacking as directed.					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.060	272.00	16.32	L-12
		Mazdoor	day	1.500	257.00	385.50	L-13
		<b>b) Material</b>					
		Supply of quarried stone 150 - 200 mm size	cum	1.100	303.85	334.24	M-002
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				44.16	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				78.02	
		<b>Rate per cum = a+b+c+d</b>				858.24	
					<b>say</b>	<b>858.00</b>	
1.6		<b>Crushing of Stone Aggregates 13.2 mm Nominal Size</b>					
		Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 13.2 mm nominal size.					
		<b>Unit = cum</b>					
		<b>Taking Output = 600 cum at crusher location.</b>					
		<b>a) Labour</b>					
		Mate	day	0.760	272.00	206.72	L-12
		Mazdoor Skilled	day	2.000	325.00	650.00	L-15
		Mazdoor including breaking of any oversize boulder.	day	17.000	257.00	4369.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	303.85	243080.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	27425.00	164550.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	1373.00	27460.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	1018.00	20360.00	P&M-048
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				27640.54	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				48831.63	
		Cost for 600 cum = (a+b+c+d+e)x0.95				510290.50	
		<b>Rate per cum = (a+b+c+d+e) * 0.95 / 600</b>				<b>850.48</b>	
					<b>say</b>	<b>850.00</b>	
		<b>Note</b> 1. 800 cum of stone boulders are needed to get 600 cum of stone chips of size 13.2 mm.					
		2. 95 per cent of above cost will be attributed to the production of 600 cum of stone chips of 13.2 mm size and balance 5 per cent to the production of stone dust which comes out as a by-product.					
		3. The integrated stone crusher includes primary and secondary crushing units.					
1.7		<b>Crushing of Stone Aggregates 20 mm Nominal Size</b>					
		Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 20 mm nominal size.					



**CARRIAGE OF MATERIALS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks / Input ref.
		<b>Unit = cum</b>					
		<b>Taking Output = 670 cum at crusher location.</b>					
		<b>a) Labour</b>					
		Mate	day	0.760	272.00	206.72	L-12
		Mazdoor Skilled	day	2.000	325.00	650.00	L-15
		Mazdoor including breaking of any size boulder.	day	17.000	257.00	4369.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	303.85	243080.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	27425.00	164550.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	1373.00	27460.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	1018.00	20360.00	P&M-048
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				27640.54	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				48831.63	
		Cost for 670 cum = (a+b+c+d+e)x0.90				483433.10	
		<b>Rate per cum = (a+b+c+d+e) * 0.90 / 670</b>				<b>721.54</b>	
					<b>say</b>	<b>722.00</b>	
		<b>Note</b> 1. 800 cum of stone boulders are needed to get 600 cum of stone chips of size 20 and 40 mm.					
		2. 90 per cent of above cost will be attributed to the production of 670 cum of stone aggregates of 20mm size and balance 10 per cent will be for smaller size aggregates and stone dust which comes out as a by-product.					
		3. The integrated stone crusher includes primary and secondary crushing units.					
<b>1.8</b>		<b>Crushing of Stone Aggregates 40 mm Nominal Size</b>					
		Crushing of stone boulders of 150 mm size in an integrated stone crushing unit of 200 tonnes per hour capacity comprising of primary and secondary crushing units, belt conveyor and vibrating screens to obtain stone aggregates of 40 mm nominal size.					
		<b>Unit = cum</b>					
		<b>Taking Output = 750 cum at crusher location.</b>					
		<b>a) Labour</b>					
		Mate	day	0.760	272.00	206.72	L-12
		Mazdoor Skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	17.000	257.00	4369.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	303.85	243080.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	27425.00	164550.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	1373.00	27460.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	1018.00	20360.00	P&M-048
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				27640.54	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				48831.63	
		Cost for 750 cum = (a+b+c+d+e)x0.85				456575.71	
		<b>Rate per cum = (a+b+c+d+e)x0.85/750</b>				<b>608.77</b>	
					<b>say</b>	<b>609.00</b>	
		<b>Note</b> 1. 800 cum of stone boulders are needed to get 600 cum of stone chips of size 13.2 mm.					
		2. 85 per cent of above cost will be attributed to the production of 750 cum of stone aggregates of 40mm size and balance 15 per cent will be for smaller size aggregates and stone dust which comes out as a by-product.					
		3. The integrated stone crusher includes primary and secondary crushing units.					

Calc.  
12/8/19

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# **CHAPTER-2**

# **SITE CLEARANCE**

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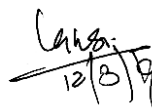


## Chapter – 2

### Site Clearance

#### Preamble:

1. Unless otherwise stated, the rates include sorting and disposal of unserviceable material and stacking of serviceable material with all lifts and upto a lead of 1000 m.
2. The rates include T&P and scaffolding required for items of dismantling.
3. Carriage of dismantled materials, bushes, branches of tree etc. has been catered with a tractor-trolley of 3 tonnes capacity with manual loading and unloading @ 2 trips per hour within a lead of 1000 m. This will be economical for such works as compared with a tipper.
4. For cutting of trees above 1800 mm girth, 4 mazdoors have been considered to cater for large size trees, which will fall in this category.
5. Where only grass/wild growth is met, item No. 2 i.e. clearing grass and removal of rubbish can be applied. As regards wild growth disposal of grass, the same can be dried and burnt .
6. The dismantling of structures has been catered both by manual and mechanical means. The estimator can use his discretion depending upon quantum of work and particular site conditions.
7. Cutting of rivets has been provided separately.
8. Dismantling of Hume pipes has been catered manually as pipes can be easily rolled by men to a suitable stacking place within the right of way.
9. For dismantling of structures, which remain submerged in water, the cost may be enhanced by 50 per cent
10. Dismantling of utilities is required to be done under the supervision of concerned departments with prior information to the users.
11. In certain items of dismantling, like, pipe culvert, utilities, etc., excavation in earth and dismantling of masonry works is not included in this analysis for which suitable notes have been inserted. These items are required to be priced separately based on actual quantities at site and nature of work.
12. The dismantled materials should be examined and realistic assessment and provision made after due process for the credit for such materials, which can be utilized for works or auctioned.
13. In case where lead for disposal is more than 1000 m, extra cost of carriage is required to be added based on tonne-kilometerage.
14. All minor T&P items required for dismantling are already included in overhead charges.
15. For dismantling of utility services like water pipe lines, electric and telephone lines, prior intimation should be given to users.

  
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# Summary of Rate Analysis

## CHAPTER - 2

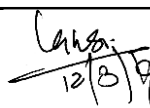
### SITE CLEARANCE

Item No.	Description	Unit	Rate (₹)
2.1	<b>Cutting of Trees, including Cutting of Trunks, Branches and Removal</b> (Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 mtrs and earth filling in the depression/pit.)		
(i)	<b>Girth from 300 mm to 600 mm</b>	each	250.00
(ii)	<b>Girth from 600 mm to 900 mm</b>	each	473.00
(iii)	<b>Girth from 900 mm to 1800 mm</b>	each	879.00
(iv)	<b>Girth above 1800 mm</b>	each	1631.00
2.2	<b>Clearing Grass and Removal of Rubbish</b>	hectare	15617.00
2.3	<b>Clearing and Grubbing Road Land</b> (Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.)		
(i)	<b>By Manual Means</b>		
A	<b>In area of light jungle</b>	hectare	47489.00
B	<b>In area of thorny jungle</b>	hectare	63743.00
(ii)	<b>By Mechanical Means</b>		
A	<b>In area of light jungle</b>	hectare	67159.00
B	<b>In area of thorny jungle</b>	hectare	81156.00
2.4	<b>Dismantling of Structures</b> (Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres.)		
(i)	<b>Lime /Cement Concrete</b>		
I	<b>By Manual Means</b>		
A	<b>Lime Concrete, cement concrete grade M-10 and below</b>	cum	387.00
B	<b>Cement Concrete Grade M-15 &amp; M-20</b>	cum	450.00
C	<b>Prestressed / Reinforced cement concrete grade M-20 &amp; above</b>	cum	1095.00
II	<b>By Mechanical Means for items No. 202 (b) &amp; (c)</b>		
A	<b>Cement Concrete Grade M-15 &amp; M-20</b>	cum	566.00
B	<b>Prestressed / Reinforced cement concrete grade M-20 &amp; above</b>	cum	904.00
(ii)	<b>Dismantling Brick / Tile work</b>		
A	<b>In lime mortar</b>	cum	262.00
B	<b>In cement mortar</b>	cum	325.00
C	<b>In mud mortar</b>	cum	237.00
D	<b>Dry brick pitching or brick soling</b>	cum	225.00
(iii)	<b>Dismantling Stone Masonry</b>		
A	<b>Rubble stone masonry in lime mortar</b>	cum	287.00
B	<b>Rubble stone masonry in cement mortar</b>	cum	325.00
C	<b>Rubble Stone Masonry in mud mortar</b>	cum	262.00
D	<b>Dry rubble masonry</b>	cum	250.00
E	<b>Dismantling stone pitching/ dry stone spalls</b>	cum	237.00
F	<b>Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials</b>	cum	262.00
(iv)	<b>Wood work wrought framed and fixed in frames of trusses upto a height of 5 m above plinth level</b>	cum	553.00
(v)	<b>Steel work in all types of sections upto a height of 5 m above plinth level excluding cutting of rivet</b>		
A	<b>Including dismembering</b>	tonne	1334.00

Calc.  
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### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
B	Excluding dismembering	tonne	1000.00
C	Extra over Item No. ( V ) A and ( V ) B for cutting rivets.	each	9.40
(vi)	Scraping of bricks dismantled from brick work including stacking		
A	In lime/Cement mortar	1000 nos.	1093.00
B	In mud mortar	1001 nos.	390.00
(vii)	Scraping of Stone from dismantled stone masonry		
A	In cement and lime mortar	cum	439.00
B	In Mud mortar	cum	93.10
(viii)	Scarping plaster in lime or cement mortar from brick/ stone masonry	sqm	14.50
(ix)	Removing all type of hume pipes and stacking within a lead of 1000 metres including earthwork and dismantling of masonry works		
A	Up to 600 mm dia	metre	162.00
B	Above 600 mm to 900 mm dia	metre	219.00
C	Above 900 mm	metre	375.00
2.5	<b>Dismantling of Flexible Pavements</b> (Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately)		
I	By Manual Means		
A	Bituminous courses	cum	710.00
B	Granular courses	cum	522.00
II	By Mechanical Means		
A	Bituminous course	cum	346.00
2.6	<b>Dismantling of Cement Concrete Pavement</b> (Dismantling of cement concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately.)	cum	1539.00
2.7	<b>Dismantling Guard Rails</b> (Dismantling guard rails by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metres, stacking serviceable materials and unserviceable materials separately.)	metre	78.70
2.8	<b>Dismantling Kerb Stone</b> (Dismantling kerb stone by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre.)	metre	17.50
2.9	<b>Dismantling Kerb Stone Channel</b> (Dismantling kerb stone channel by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre.)	metre	26.30
2.10	<b>Dismantling Kilometre Stone</b> (Dismantling of kilometre stone including cutting of earth, foundation and disposal of dismantled material with all lifts and lead upto 1000 m and back filling of pit.)		
A	5th KM stone	each	361.00
B	Ordinary KM Stone	each	220.00
C	Hectometre Stone	each	44.00
2.11	<b>Dismantling of Fencing</b> (Dismantling of barbed wire fencing/ wire mesh fencing including posts, foundation concrete, back filling of pit by manual means including disposal of dismantled material with all lifts and up to a lead of 1000 metres, stacking serviceable material and unserviceable material separately.)	metre	44.80
2.12	<b>Dismantling of CI Water Pipe Line</b> (Dismantling of CI water pipe line 600 mm dia including disposal with all lifts and lead upto 1000 metres and stacking of serviceable material and unserviceable material separately under supervision of concerned department.)	metre	131.00
2.13	<b>Removal of Cement Concrete Pipe of Sewer Gutter</b> (Removal of cement concrete pipe of sewer gutter 1500 mm dia under the supervision of concerned department including disposal with all lifts and up to a lead of 1000 metres and stacking of serviceable and unserviceable material separately but excluding earth excavation and dismantling of masonry works.)	metre	231.00
2.14	<b>Removal of Telephone / Electric Poles and Lines</b> (Removal of telephone / Electric poles including excavation and dismantling of foundation concrete and lines under the supervision of concerned department, disposal with all lifts and up to a lead of 1000 metres and stacking the serviceable and unserviceable material separately.)	each	162.00

  
 12/3/19



Analysis of Rates  
**CHAPTER - 2**  
**SITE CLEARANCE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
2.1	201	<b>Cutting of Trees, including cutting of Trunks, Branches and Removal</b>					
		Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 metres and earth filling in the depression / pit.					
		<b>Unit = Each</b>					
	(i)	<b>Girth from 300 mm to 600 mm</b>					
		<b>a) Labour</b>					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoors for cutting trees including cutting, refilling, compaction of backfilling and stacking of serviceable materials within 1000 metres lead by manual means.	day	0.600	257.00	154.20	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.100	546.00	54.60	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				12.85	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				22.71	
		<b>Rate for each tree = a+b+c+d</b>				249.80	
					<b>say</b>	<b>250.00</b>	
2.1	(ii)	<b>Girth from 600 mm to 900 mm</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoors for cutting trees including cutting, refilling, compaction of backfilling, and stacking of serviceable materials within 1000 metres lead by manual means.	day	0.900	257.00	231.30	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.300	546.00	163.80	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				24.36	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				43.03	
		<b>Rate for each tree = a+b+c+d</b>				473.37	
					<b>say</b>	<b>473.00</b>	
2.1	(iii)	<b>Girth from 900 mm to 1800 mm</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoors for cutting trees including cutting, refilling, compaction of backfilling and stacking of serviceable materials within 1000 metres	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.400	546.00	218.40	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				45.25	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				79.94	
		<b>Rate for each tree = a+b+c+d</b>				879.35	
					<b>say</b>	<b>879.00</b>	
2.1	(iv)	<b>Girth above 1800 mm</b>					
		<b>a) Labour</b>					
		Mate	day	0.160	272.00	43.52	L-12
		Mazdoors for cutting trees including cutting, refilling, compaction of backfilling and stacking of serviceable materials within 1000 metres	day	4.000	257.00	1028.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.600	546.00	327.60	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				83.95	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				148.31	
		<b>Rate for each tree = a+b+c+d</b>				1631.37	
					<b>say</b>	<b>1631.00</b>	

Analysis of Rates  
**SITE CLEARANCE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
2.2	201	<b>Clearing Grass and Removal of Rubbish</b>					
		Clearing grass and removal of rubbish up to a distance of 50 metres outside the periphery of the area .					
		<b>By Manual Means</b>					
		<b>Unit = Hectare</b>					
		<b>Taking output = 1 Hectare</b>					
		a) Labour					
		Mate	day	2.000	272.00	544.00	L-12
		Mazdoor	day	50.000	257.00	12850.00	L-13
		b) Overhead charges @ 0.06 on (a)				803.64	
		c) Contractor's profit @ 0.1 on (a+b)				1419.76	
		Rate per Hectare = a+b+c				15617.40	
					say	<b>15617.00</b>	
2.3	201	<b>Clearing and Grubbing Road Land</b>					
		Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned, up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.					
		<b>Unit = Hectare</b>					
		<b>Taking output = 1 Hectare</b>					
		(i) <b>By Manual Means</b>					
		<b>A In area of light jungle</b>					
		a) Labour					
		Mate	day	6.000	272.00	1632.00	L-12
		Mazdoor	day	150.000	257.00	38550.00	L-13
		b) Machinery					
		Tractor-trolley	hour	1.000	546.00	546.00	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				2443.68	
		d) Contractor's profit @ 0.1 on (a+b+c)				4317.17	
		Rate per Hectare = a+b+c+d				47488.85	
					say	<b>47489.00</b>	
2.3 (i)		<b>B In area of thorny jungle</b>					
		a) Labour					
		Mate	day	8.000	272.00	2176.00	L-12
		Mazdoor	day	200.000	257.00	51400.00	L-13
		b) Machinery					
		Tractor-trolley	hour	2.000	546.00	1092.00	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				3280.08	
		d) Contractor's profit @ 0.1 on (a+b+c)				5794.81	
		Rate per Hectare = a+b+c+d				63742.89	
					say	<b>63743.00</b>	
2.3		(ii) <b>By Mechanical Means</b>					
		<b>A In area of light jungle</b>					
		a) Labour					
		Mate	day	0.160	272.00	43.52	L-12
		Mazdoor	day	4.000	257.00	1028.00	L-13
		b) Machinery					
		Dozer 80 HP with attachment for removal of trees & stumps	hour	10.000	5598.00	55980.00	P&M-014
		Tractor-trolley	hour	1.000	546.00	546.00	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				3455.85	
		d) Contractor's profit @ 0.1 on (a+b+c)				6105.34	
		Rate per Hectare = a+b+c+d				67158.71	
					say	<b>67159.00</b>	

L.H.S.  
12/8/19

Analysis of Rates  
**SITE CLEARANCE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
2.3 (ii)		B	In area of thorny jungle					
			a) Labour					
			Mate	day	0.240	272.00	65.28	L-12
			Mazdoor	day	6.000	257.00	1542.00	L-13
			b) Machinery					
			Dozer 80 HP with attachment for removal of trees & stumps	hour	12.000	5598.00	67176.00	P&M-014
			Tractor-trolley	hour	1.500	546.00	819.00	P&M-053
			c) Overhead charges @ 0.06 on (a+b)				4176.14	
			d) Contractor's profit @ 0.1 on (a+b+c)				7377.84	
			Rate per Hectare = a+b+c+d				81156.26	
						say	<b>81156.00</b>	
2.4	202		Dismantling of Structures					
			Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres.					
			Unit = cum					
			Taking output = 1.25 cum					
		(i)	Lime /Cement Concrete					
		I	By Manual Means					
		A	Lime Concrete, cement concrete grade M-10 and below					
			a) Labour					
			Mate	day	0.040	272.00	10.88	L-12
			Mazdoor for dismantling and loading	day	1.000	257.00	257.00	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
			c) Overhead charges @ 0.06 on (a+b)				24.92	
			d) Contractor's profit @ 0.1 on (a+b+c)				44.02	
			Cost for 1.25 cum = a+b+c+d				484.24	
			Rate per cum = (a+b+c+d)/ 1.25				387.39	
						say	<b>387.00</b>	
2.4 (i)		B	Cement Concrete Grade M-15 & M-20					
			a) Labour					
			Mate	day	0.050	272.00	13.60	L-12
			Mazdoor for dismantling and loading	day	1.250	257.00	321.25	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
			c) Overhead charges @ 0.06 on (a+b)				28.94	
			d) Contractor's profit @ 0.1 on (a+b+c)				51.12	
			Cost for 1.25 cum = a+b+c+d				562.33	
			Rate per cum = (a+b+c+d)/ 1.25				449.86	
						say	<b>450.00</b>	
2.4 (i)		C	Prestressed / Reinforced cement concrete grade M-20 & above					
			a) Labour					
			Mate	day	0.150	272.00	40.80	L-12
			Blacksmith	day	0.250	345.00	86.25	L-02a
			Mazdoor for dismantling, loading and unloading	day	3.500	257.00	899.50	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
			c) Overhead charges @ 0.06 on (a+b)				70.44	

Analysis of Rates  
**SITE CLEARANCE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		d) Contractor's profit @ 0.1 on (a+b+c)				124.44	
		Cost for 1.25 cum = a+b+c+d				1368.85	
		Rate per cum = (a+b+c+d)/ 1.25				1095.08	
					say	<u>1095.00</u>	
2.4	II	By Mechanical Means for items No. 202 (B) & (C)					
	A	Cement Concrete Grade M-15 & M-20					
		a) Labour					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoor for loading and unloading	day	0.250	257.00	64.25	L-13
		Mazdoor with Pneumatic breaker	day	0.250	268.00	67.00	L-14
		b) Machinery					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1.5 cum per hour	hour	0.670	481.00	322.27	P&M-001
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				36.38	
		d) Contractor's profit @ 0.1 on (a+b+c)				64.28	
		Cost for 1.25 cum = a+b+c+d				707.04	
		Rate per cum = (a+b+c+d)/ 1.25				565.63	
					say	<u>566.00</u>	
2.4 II	B	Prestressed / reinforced cement concrete grade M-20 & above					
		a) Labour					
		Mate	day	0.050	272.00	13.60	L-12
		Mazdoor with Pneumatic breaker	day	0.660	268.00	176.88	L-14
		Blacksmith	day	0.250	345.00	86.25	L-02a
		Mazdoor for loading and unloading	day	0.250	257.00	64.25	L-13
		b) Machinery					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1.00 cum per hour	hour	1.000	481.00	481.00	P&M-001
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				58.16	
		d) Contractor's profit @ 0.1 on (a+b+c)				102.76	
		Cost for 1.25 cum = a+b+c+d				1130.32	
		Rate per cum = (a+b+c+d)/ 1.25				904.26	
					say	<u>904.00</u>	
2.4	(ii)	Dismantling Brick / Tile work					
	A	In lime mortar					
		a) Labour					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoor for dismantling, loading and unloading	day	0.500	257.00	128.50	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				16.88	
		d) Contractor's profit @ 0.1 on (a+b+c)				29.82	
		Cost for 1.25 cum = a+b+c+d				328.07	
		Rate per cum = (a+b+c+d)/ 1.25				262.45	
					say	<u>262.00</u>	
2.4 (ii)	B	In cement mortar					
		a) Labour					
		Mate	day	0.030	272.00	8.16	L-12
		Mazdoor for dismantling, loading and unloading	day	0.750	257.00	192.75	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				20.90	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		d) Contractor's profit @ 0.1 on (a+b+c)				36.92	
		Cost for 1.25 cum = a+b+c+d				406.15	
		Rate per cum = (a+b+c+d)/ 1.25				324.92	
					say	<u>325.00</u>	
2.4 (ii)	C	In mud mortar					
		a) Labour					
		Mate	day	0.016	272.00	4.35	L-12
		Mazdoor for dismantling and loading	day	0.400	257.00	102.80	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				15.27	
		d) Contractor's profit @ 0.1 on (a+b+c)				26.98	
		Cost for 1.25 cum = a+b+c+d				296.83	
		Rate per cum = (a+b+c+d)/ 1.25				237.46	
					say	<u>237.00</u>	
2.4 (ii)	D	Dry brick pitching or brick soling					
		a) Labour					
		Mate	day	0.014	272.00	3.81	L-12
		Mazdoor for Dismantling, loading and unloading	day	0.350	257.00	89.95	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				14.47	
		d) Contractor's profit @ 0.1 on (a+b+c)				25.56	
		Cost for 1.25 cum = a+b+c+d				281.21	
		Rate per cum = (a+b+c+d)/ 1.25				224.97	
					say	<u>225.00</u>	
2.4	(iii)	Dismantling Stone Masonry					
	A	Rubble stone masonry in lime mortar					
		a) Labour					
		Mate	day	0.024	272.00	6.53	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.600	257.00	154.20	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				18.49	
		d) Contractor's profit @ 0.1 on (a+b+c)				32.66	
		Cost for 1.25 cum = a+b+c+d				359.30	
		Rate per cum = (a+b+c+d)/ 1.25				287.44	
					say	<u>287.00</u>	
2.4 (iii)	B	Rubble stone masonry in cement mortar					
		a) Labour					
		Mate	day	0.030	272.00	8.16	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.750	257.00	192.75	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				20.90	
		d) Contractor's profit @ 0.1 on (a+b+c)				36.92	
		Cost for 1.25 cum = a+b+c+d				406.15	
		Rate per cum = (a+b+c+d)/ 1.25				324.92	
					say	<u>325.00</u>	
2.4 (iii)	C	Rubble Stone Masonry in mud mortar					
		a) Labour					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.500	257.00	128.50	L-13

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				16.88	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				29.82	
		Cost for 1.25 cum = a+b+c+d				328.07	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				262.45	
					<b>say</b>	<b><u>262.00</u></b>	
<b>2.4 (iii)</b>	<b>D</b>	<b>Dry rubble masonry</b>					
		<b>a) Labour</b>					
		Mate	day	0.018	272.00	4.90	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.450	257.00	115.65	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				16.08	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				28.40	
		Cost for 1.25 cum = a+b+c+d				312.45	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				249.96	
					<b>say</b>	<b><u>250.00</u></b>	
<b>2.4 (iii)</b>	<b>E</b>	<b>Dismantling stone pitching/ dry stone spalls.</b>					
		<b>a) Labour</b>					
		Mate	day	0.016	272.00	4.35	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.400	257.00	102.80	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				15.27	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				26.98	
		Cost for 1.25 cum = a+b+c+d				296.83	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				237.46	
					<b>say</b>	<b><u>237.00</u></b>	
<b>2.4 (iii)</b>	<b>F</b>	<b>Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials.</b>					
		<b>a) Labour</b>					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoor for dismantling, loading and unloading	day	0.500	257.00	128.50	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				16.88	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				29.82	
		Cost for 1.25 cum = a+b+c+d				328.07	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				262.45	
					<b>say</b>	<b><u>262.00</u></b>	
<b>2.4</b>	<b>(iv)</b>	<b>Wood Work wrought framed and fixed in frames of trusses upto a height of 5 m above plinth level</b>					
		<b>a) Labour</b>					
		Mate	day	0.060	272.00	16.32	L-12
		Carpenter	day	0.500	345.00	172.50	L-04
		Mazdoor for dismantling, loading and unloading.	day	1.000	257.00	257.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.270	546.00	147.42	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				35.59	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				62.88	
		Cost for 1.25 cum = a+b+c+d				691.72	
		<b>Rate per cum = (a+b+c+d)/ 1.25</b>				553.37	
					<b>say</b>	<b><u>553.00</u></b>	

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Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
2.4		(v)	Steel Work in all types of sections upto a height of 5 m above plinth level excluding cutting of rivet					
			Unit = tonne					
			Taking output = 1 tonne					
		A	Including dismembering					
			a) Labour					
			Mate	day	0.140	272.00	38.08	L-12
			Blacksmith	day	1.000	345.00	345.00	L-02a
			Mazdoor for dismantling, loading and unloading	day	2.500	257.00	642.50	L-13
			Add 2.5 per cent of cost of labour for gas cutting, ropes, pulleys etc.				25.64	
			b) Machinery					
			Tractor-trolley	hour	0.170	546.00	92.82	P&M-053
			c) Overhead charges @ 0.06 on (a+b)				68.64	
			d) Contractor's profit @ 0.1 on (a+b+c)				121.27	
			Rate per tonne = a+b+c+d				1333.95	
						say	1334.00	
2.4 (v)		B	Excluding dismembering					
			a) Labour					
			Mate	day	0.220	272.00	59.84	L-12
			Mazdoor for dismantling, loading and unloading	day	2.000	257.00	514.00	L-13
			Blacksmith	day	0.500	345.00	172.50	L-02a
			Add 2.5 per cent of cost of labour for gas cutting, ropes, pulleys etc.				18.66	
			b) Machinery					
			Tractor-trolley	hour	0.170	546.00	92.82	P&M-053
			c) Overhead charges @ 0.06 on (a+b)				51.47	
			d) Contractor's profit @ 0.1 on (a+b+c)				90.93	
			Rate per tonne = a+b+c+d				1000.22	
						say	1000.00	
2.4 (v)		C	Extra over item No. (v) A and (v) B for cutting rivets					
			Unit = each					
			Taking output = 10 rivets					
			a) Labour					
			Mate	day	0.010	272.00	2.72	L-12
			Blacksmith	day	0.130	345.00	44.85	L-02a
			Mazdoor	day	0.130	257.00	33.41	L-13
			b) Overhead charges @ 0.06 on (a)				4.86	
			c) Contractor's profit @ 0.1 on (a+b)				8.58	
			Cost for 10 rivets = a+b+c				94.42	
			Rate for each rivet = (a+b+c)/10				9.44	
						say	9.40	
2.4		(vi)	Scraping of Bricks Dismantled from Brick Work including Stacking.					
			Unit = numbers					
			Taking output = 1000 numbers					
		A	In lime/Cement mortar					
			a) Labour					
			Mate	day	0.140	272.00	38.08	L-12
			Mazdoor	day	3.500	257.00	899.50	L-13
			b) Overhead charges @ 0.06 on (a)				56.25	
			c) Contractor's profit @ 0.1 on (a+b)				99.38	
			Rate per 1000 Nos. = a+b+c				1093.22	
						say	1093.00	



Analysis of Rates  
**SITE CLEARANCE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
2.4 (vi)		B	In mud mortar					
			a) Labour					
			Mate	day	0.050	272.00	13.60	L-12
			Mazdoor	day	1.250	257.00	321.25	L-13
			b) Overhead charges @ 0.06 on (a)				20.09	
			c) Contractor's profit @ 0.1 on (a+b)				35.49	
			Rate per 1000 Nos = a+b+c				390.44	
						say	<u>390.00</u>	
2.4		(vii)	Scraping of Stone from Dismantled Stone Masonry					
			Unit = cum					
			Taking output = 1 cum					
		A	In cement and lime mortar					
			a) Labour					
			Mate	day	0.060	272.00	16.32	L-12
			Mazdoor	day	1.400	257.00	359.80	L-13
			b) Overhead charges @ 0.06 on (a)				22.57	
			c) Contractor's profit @ 0.1 on (a+b)				39.87	
			Rate per cum = a+b+c				438.56	
						say	<u>439.00</u>	
2.4 (vii)		B	In mud mortar					
			a) Labour					
			Mate	day	0.010	272.00	2.72	L-12
			Mazdoor	day	0.300	257.00	77.10	L-13
			b) Overhead charges @ 0.06 on (a)				4.79	
			c) Contractor's profit @ 0.1 on (a+b)				8.46	
			Rate per cum = a+b+c				93.07	
						say	<u>93.10</u>	
2.4		(viii)	Scarping Plaster in Lime or Cement Mortar from Brick/ Stone Masonry					
			Unit = sqm					
			Taking output = 100 sqm					
			a) Labour					
			Mate	day	0.160	272.00	43.52	L-12
			Mazdoor for scarping and loading	day	4.000	257.00	1028.00	L-13
			b) Machinery					
			Tractor-trolley	hour	0.320	546.00	174.72	P&M-053
			c) Overhead charges @ 0.06 on (a+b)				74.77	
			d) Contractor's profit @ 0.1 on (a+b+c)				132.10	
			Cost for 100 sqm = a+b+c+d				1453.12	
			Rate per sqm = (a+b+c+d)/100				14.53	
						say	<u>14.50</u>	
2.4		(ix)	Removing all type of Hume Pipes and Stacking within a lead of 1000 metres including Earthwork and Dismantling of Masonry Works					
			Unit = metre					
			Taking output = 1 metre					
		A	Up to 600 mm dia					
			a) Labour					
			Mate	day	0.020	272.00	5.44	L-12
			Mazdoor	day	0.520	257.00	133.64	L-13
			b) Overhead charges @ 0.06 on (a)				8.34	
			c) Contractor's profit @ 0.1 on (a+b)				14.74	
			Rate per metre = a+b+c				162.17	
						say	<u>162.00</u>	

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Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
2.4 (ix)		B	Above 600 mm to 900 mm dia					
			a) Labour					
			Mate	day	0.030	272.00	8.16	L-12
			Mazdoor	day	0.700	257.00	179.90	L-13
			b) Overhead charges @ 0.06 on (a)				11.28	
			c) Contractor's profit @ 0.1 on (a+b)				19.93	
			Rate per metre = a+b+c				219.28	
						say	<u>219.00</u>	
2.4 (ix)		C	Above 900 mm					
			a) Labour					
			Mate	day	0.050	272.00	13.60	L-12
			Mazdoor	day	1.200	257.00	308.40	L-13
			b) Overhead charges @ 0.06 on (a)				19.32	
			c) Contractor's profit @ 0.1 on (a+b)				34.13	
			Rate per metre = a+b+c				375.45	
						say	<u>375.00</u>	
		Note	1. The excavation of earth, dismantling of stone masonry work in head walls and protection works is not included which is to be measured and paid separately.					
			2. Credit for retrieved stone from masonry work may be taken as per actual availability.					
2.5	202		Dismantling of Flexible Pavements					
			Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately.					
			Unit = cum					
			Taking output = 1 cum					
		I	By Manual Means					
		A	Bituminous courses					
			a) Labour					
			Mate	day	0.060	272.00	16.32	L-12
			Mazdoor for dismantling, loading and unloading	day	1.500	257.00	385.50	L-13
			b) Machinery					
			Tractor-trolley	hour	0.380	546.00	207.48	P&M-053
			c) Overhead charges @ 0.06 on (a+b)				36.56	
			d) Contractor's profit @ 0.1 on (a+b+c)				64.59	
			Rate per cum = a+b+c+d				710.44	
						say	<u>710.00</u>	
2.5 I		B	Granular courses					
			a) Labour					
			Mate	day	0.040	272.00	10.88	L-12
			Mazdoor for dismantling, loading and unloading	day	1.000	257.00	257.00	L-13
			b) Machinery					
			Tractor-trolley	hour	0.330	546.00	180.18	P&M-053
			c) Overhead charges @ 0.06 on (a+b)				26.88	
			d) Contractor's profit @ 0.1 on (a+b+c)				47.49	
			Rate per cum = a+b+c+d				522.44	
						say	<u>522.00</u>	
2.5		II	By Mechanical Means					
		A	Bituminous course					
			a) Labour					
			Mate	day	0.010	272.00	2.72	L-12
			Mazdoor	day	0.300	257.00	77.10	L-13

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.380	546.00	207.48	P&M-053
		Farm tractor with ripper @ 60 cum per hour	hour	0.017	558.00	9.49	P&M-055
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				17.81	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				31.46	
		<b>Rate per cum = a+b+c+d</b>				346.05	
					<b>say</b>	<b>346.00</b>	
<b>2.6</b>	<b>202</b>	<b>Dismantling of Cement Concrete Pavement</b>					
		Dismantling of cement concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately.					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.030	272.00	8.16	L-12
		Semi skilled mazdoor for operating pneumatic tools	day	0.500	268.00	134.00	L-14
		Mazdoors as helpers including loading and unloading	day	0.500	257.00	128.50	L-13
		<b>b) Machinery</b>					
		Air compressor 250 cfm with two leads for pneumatic cutters/ hammers @ 1 cum per hour	hour	1.000	481.00	481.00	P&M-001
		Tractor-trolley	hour	0.400	546.00	218.40	P&M-053
		Joint Cutting Machine with 2-3 blades	hour	1.000	350.00	350.00	P&M-083
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				79.20	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				139.93	
		<b>Rate per cum = a+b+c+d</b>				1539.19	
					<b>say</b>	<b>1539.00</b>	
		<b>Note</b> The above analysis is for removal of complete pavement. In case full depth repair work is required to be done after dismantling, provision of a concrete cutting and sawing machine may be added for 0.25 hours.					
<b>2.7</b>	<b>202</b>	<b>Dismantling of Guard Rails</b>					
		Dismantling guard rails by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metres, stacking serviceable materials and unserviceable materials separately.					
		<b>Unit = running metre</b>					
		<b>Taking output = 1 metre</b>					
		<b>a) Labour</b>					
		Mate	day	0.006	272.00	1.63	L-12
		Mazdoor including loading and unloading	day	0.150	257.00	38.55	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.050	546.00	27.30	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				4.05	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				7.15	
		<b>Rate per metre = a+b+c+d</b>				78.68	
					<b>say</b>	<b>78.70</b>	
<b>2.8</b>	<b>202</b>	<b>Dismantling of Kerb Stone</b>					
		Dismantling kerb stone by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre.					
		<b>Unit = running metre</b>					
		<b>Taking output = 10 metre</b>					
		<b>a) Labour</b>					

Calc.  
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Analysis of Rates  
**SITE CLEARANCE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	0.010	272.00	2.72	L-12
		Mazdoor including loading and unloading	day	0.150	257.00	38.55	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.200	546.00	109.20	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				9.03	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				15.95	
		Cost for 10 m = a+b+c+d				175.45	
		<b>Rate per metre = (a+b+c+d)/10</b>				17.54	
					<b>say</b>	<b>17.50</b>	
<b>2.9</b>	<b>202</b>	<b>Dismantling of Kerb Stone Channel</b>					
		Dismantling kerb stone channel by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre.					
		<b>Unit = running metre</b>					
		<b>Taking output = 10 metre</b>					
		<b>a) Labour</b>					
		Mate	day	0.015	272.00	4.08	L-12
		Mazdoor including loading and unloading	day	0.225	257.00	57.83	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.300	546.00	163.80	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				13.54	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				23.92	
		Cost for 10 m = a+b+c+d				263.17	
		<b>Rate per metre = (a+b+c+d)/10</b>				26.32	
					<b>say</b>	<b>26.30</b>	
<b>2.10</b>	<b>202</b>	<b>Dismantling of Kilometre Stone</b>					
		Dismantling of kilometre stone including cutting of earth, foundation and disposal of dismantled material with all lifts and lead upto 1000 m and back filling of pit.					
		<b>Unit = Each</b>					
		<b>Taking output = one KM stone</b>					
	<b>A</b>	<b>5th KM stone</b>					
		Quantity of cement concrete = 0.392 cum					
		<b>a) Labour</b>					
		Mate	day	0.130	272.00	35.36	L-12
		Mazdoor	day	0.750	257.00	192.75	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.150	546.00	81.90	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				18.60	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				32.86	
		Rate for one 5th KM stone = a+b+c+d				361.47	
					<b>say</b>	<b>361.00</b>	
	<b>B</b>	<b>Ordinary KM Stone</b>					
		Quantity of cement concrete = 0.269 cum					
		<b>a) Labour</b>					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoor	day	0.500	257.00	128.50	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.100	546.00	54.60	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				11.31	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				19.99	
		Rate for one ordinary KM stone = a+b+c+d				219.84	
					<b>say</b>	<b>220.00</b>	

Analysis of Rates  
**SITE CLEARANCE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
	C	Hectometre Stone					
		Quantity of cement concrete = 0.048 cum					
		a) Labour					
		Mate	day	0.004	272.00	1.09	L-12
		Mazdoor	day	0.100	257.00	25.70	L-13
		b) Machinery					
		Tractor-trolley	hour	0.020	546.00	10.92	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				2.26	
		d) Contractor's profit @ 0.1 on (a+b+c)				4.00	
		Rate for one Hectometre stone = a+b+c+d				43.97	
					say	<u>44.00</u>	
2.11	202	Dismantling of Fencing					
		Dismantling of barbed wire fencing/ wire mesh fencing including posts, foundation concrete, back filling of pit by manual means including disposal of dismantled material with all lifts and up to a lead of 1000 metres, stacking serviceable material and unserviceable material separately.					
		Unit = running metre					
		Taking output = 30 metres					
		a) Labour					
		Mate	day	0.150	272.00	40.80	L-12
		Mazdoor including loading and unloading	day	3.000	257.00	771.00	L-13
		Blacksmith	day	0.750	345.00	258.75	L-02a
		b) Machinery					
		Tractor-trolley	hour	0.150	546.00	81.90	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				69.15	
		d) Contractor's profit @ 0.1 on (a+b+c)				122.16	
		Cost for 30 metres = a+b+c+d				1343.76	
		Rate per metre = (a+b+c+d)/30				44.79	
					say	<u>44.80</u>	
2.12	202	Dismantling of CI Water Pipe Line					
		Dismantling of CI water pipe line 600 mm dia including disposal with all lifts and lead upto 1000 metres and stacking of serviceable material and unserviceable material separately under supervision of concerned department.					
		Unit = running metre					
		Taking output = 10 metres					
		a) Labour					
		Mate	day	0.090	272.00	24.48	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		Plumber	day	0.250	326.00	81.50	L-02c
		b) Machinery					
		Truck 10 tonne capacity	hour	0.250	929.00	232.25	P&M-057
		Light Crane 3 tonne capacity	hour	0.500	537.00	268.50	P&M-013
		c) Overhead charges @ 0.06 on (a+b)				67.24	
		d) Contractor's profit @ 0.1 on (a+b+c)				118.80	
		Cost for 10 metres = a+b+c+d				1306.77	
		Rate per metre = (a+b+c+d)/10				130.68	
					say	<u>131.00</u>	
		Note					
		The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.					

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Analysis of Rates  
**SITE CLEARANCE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
2.13	202	<b>Removal of Cement Concrete Pipe of Sewer Gutter</b>					
		Removal of cement concrete pipe of sewer gutter 1500 mm dia under the supervision of concerned department including disposal with all lifts and up to a lead of 1000 metres and stacking of serviceable and unserviceable material separately but excluding earth excavation and dismantling of masonry works.					
		<b>Unit = running metre</b>					
		<b>Taking output = 10 metres</b>					
		<b>a) Labour</b>					
		Mate	day	0.100	272.00	27.20	L-12
		Mazdoor	day	2.500	257.00	642.50	L-13
		<b>b) Machinery</b>					
		Crane 5 tonne capacity	hour	0.300	1282.00	384.60	P&M-070
		Truck flat body 10 tonne	hour	1.000	929.00	929.00	P&M-057
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				119.00	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				210.23	
		Cost for 10 metres = a+b+c+d				2312.53	
		<b>Rate per metre = (a+b+c+d)/10</b>				231.25	
					<b>say</b>	<b><u>231.00</u></b>	
		<b>Note</b> The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.					
2.14	202	<b>Removal of Telephone / Electric Poles and Lines</b>					
		Removal of telephone / Electric poles including excavation and dismantling of foundation concrete and lines under the supervision of concerned department, disposal with all lifts and up to a lead of 1000 metres and stacking the serviceable and unserviceable material separately.					
		<b>Unit = each</b>					
		<b>Taking output = 30 Nos.</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	272.00	130.56	L-12
		Mazdoor	day	10.000	257.00	2570.00	L-13
		Electrician/Lineman	day	2.000	326.00	652.00	L-02d
		<b>b) Machinery</b>					
		Tractor-trolley	hour	1.500	546.00	819.00	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				250.29	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				442.19	
		Cost for 30 poles = a+b+c+d				4864.04	
		<b>Rate per pole = (a+b+c+d)/30</b>				162.13	
					<b>say</b>	<b><u>162.00</u></b>	

Calc.  
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## **CHAPTER-3**

# **EARTHWORK, EROSION CONTROL AND DRAINAGE**

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## **Chapter – 3**

### **Earthwork, Erosion Control and Drainage**

#### **Preamble:**

1. The rates have been analysed using mechanical means. Manual means for certain items have also been provided which can be used for areas inaccessible to machines and for small jobs.
2. In the rate analyses of earthwork, only compacted volume of earth has been considered.
3. Rates have been analysed for average working conditions.
4. Average achievable outputs of machines have been considered taking into account job and management factors.
5. Cutting by dozer has been proposed where the cut earth can be utilized for filling of embankment within a lead of 100 m. A dozer can economically push the earth upto a distance of 100 m.
6. Where lead for transporting of earth is more than 100 m., excavator and tipper have been provided.
7. A water tanker of 6 KL capacity which is commonly used at construction sites has been considered.
8. The rate caters for disposal of unsuitable soil only upto a distance of 1 km. The cost of transportation beyond the initial lead of 1 km will be paid separately based on tonne-kilometerage.
9. The replacement of unsuitable soil by suitable soil shall be included separately in the estimate. The rate analyses for removal of unsuitable soil does not provide for replacement by suitable soil.
10. In cases where embankment is constructed with earth taken from roadways, the cost of depositing the earth at the site of embankment is already included in the disposal of excavated earth.
11. For narrow and restricted areas, plate compactor has been proposed for compaction to achieve the desired density.
12. For small jobs where loading and unloading is required to be done manually, tractor – trolley has been proposed for carriage instead of a tipper.
13. In case excavated rock is found suitable for incorporation in works, suitable credit for the available rock shall be given.
14. The possibility of using the blasted rock fragments for backfilling behind structures or backfilling of foundation pits or filling in medians / separators or use in service road shall be examined before proposing disposal of excavated rock.
15. In case of hill roads, the cut earth can be pushed down the valley in case there is no objection. In that case, cost of disposal is not required to be provided.

  
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16. 'L' represents lead in km one way. This will vary from project - to - project and is required to be ascertained at site at the time of estimation.
17. For in habited areas, controlled blasting with limited charges of explosives has been provided. This involves smaller drill holes and additional requirement of electric detonators. Provision has accordingly been made.
18. Any work involved for water courses at culverts (Clause 312) will be priced under respective items like, excavation, grubbing, clearing etc. for which rate analysis have separately been made.
19. In the case of embankment made from earth taken from roadway cutting, the input of dozer for spreading earth can be deleted as the same is already provided in the cost of excavation.
20. Earth excavated from drains can be used in roadway berms. Hence, carriage for disposal of same is not provided.
21. In the rate analyses of some items, the quantities of sub-items involved in that analysis like excavation for foundation, foundation concrete, painting, lettering etc. have been given. The rates for such items shall be taken from relevant chapters where the same have already been analysed.
22. In case of rock fill embankment, it is assumed that material is available at site from rock cutting.
23. The item of preparation and surface treatment of formation (Clause 310) is required to be added in the cost estimate only if there is substantial time lag between completion of sub-grade and laying of sub - base. As this item is incidental to works, it is not required to be included in BOQ.
24. The items filling behind abutments and wing wall and provision of filter media has been included in chapter-15.
25. Excavation for structures beyond the depth of 3m has been included in chapter - 12.
26. In case of high altitude areas above 2100m, the percentage addition to the cost of manpower and usage rates of machines are required to be made as per the Table given on next page.

*Chandra*  
12/8/19

## Extra Provision for High Altitude Areas

Considering loss of output of men and machines above 2100 mtrs. altitude, the percentage addition to cost of manpower and usage rates of machines are required to be made as under :-

Altitude in Mtrs	Percent of the value in Manpower to be added to rates	Percent of the value in Machines to be added to rates
2100 to 2400	7 per cent	3 per cent
2401 to 2700	15 per cent	6 per cent
2701 to 3000	25 per cent	9 per cent
3001 to 3300	32 per cent	12 per cent
3301 to 3600	48 per cent	15 per cent
3601 to 3900	66 per cent	18 per cent
3901 to 4200	86 per cent	21 per cent
4201 to 4500	108 per cent	24 per cent
4501 to 4800	132 per cent	27 per cent
4801 to 5100	186 per cent	30 per cent


The above provisions are based on the report of Defence institute of Physiology and Allied Sciences, Delhi Cantt. regarding quantitative reduction in the physical work capacity of individuals working in high altitude areas and the recommendation of the committee on cost of construction set up by Border Roads Development Board for reduction in output of machines while working in high altitudes. These figures are adopted from “Standard Schedule of Rates” of BRO as applicable to high altitude areas.

*Chh.*  
12/8/19



Summary of Rate Analysis  
**CHAPTER - 3**  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

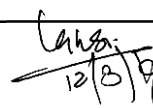
Item No.	Description	Unit	Rate (₹)
<b>3.1</b>	<b>Excavation in Soil by Manual Means.</b> (Excavation for roadway in soil using manual means including loading in truck for carrying of cut earth to embankment site with all lifts and lead upto 1000 metres.)		
(i)	Including Royalty @ ₹22.0 per cum but excluding the cost of watering, rolling & compaction	cum	229.00
(ii)	Including Royalty @ ₹22.0 per cum and cost of watering, rolling & compaction	cum	254.00
<b>Note</b>	In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, <u>the item of carriage in the truck shall be omitted.</u> Including Royalty @ ₹22.00 per cum.	cum	229.00
<b>3.2 (i)</b>	<b>Excavation in ordinary rock by manual means</b> (Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with in all lifts and leads upto 1000 metres ) Including royalty @ ₹22.00 per cum but excluding cost of watering , rolling & compaction.	cum	294.00
(ii)	Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with in all lifts and leads upto 1000 metres. Including royalty @ ₹22.00 per cum and cost of watering , rolling & compaction.	cum	319.00
<b>Note</b>	In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, <u>the item of carriage in the truck shall be omitted.</u> Including Royalty @ ₹22.00 per cum.	cum	294.00
<b>3.3</b>	<b>Excavation in Soil with Dozer with lead upto 100 metres</b> (Excavation for road way in soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead 50 metres), including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)	cum	221.00
<b>3.4</b>	<b>Excavation in Ordinary Rock with Dozer with lead upto 100 metres</b> (Excavation for roadway in ordinary rock by deploying a dozer, 80 HP including cutting and pushing the cut earth to site of embankment upto a distance of 100 metres ( average lead 50 metres ), trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.)	cum	371.00
<b>3.5</b>	<b>Excavation in Hard Rock (requiring blasting) with disposal upto 1000 metres</b> (Excavation for roadway in hard rock (requiring blasting) by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres.)	cum	572.00
<b>3.6</b>	<b>Excavation in Soil using Hydraulic Excavator CK 90 and Tippers with disposal upto 1000 metres.</b> (Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m.)		
(i)	Including Royalty @ ₹22.00 per cum but excluding the cost of watering, rolling & compaction.	cum	115.00
(ii)	Including Royalty @ ₹22.00 per cum, cost of watering, rolling & compaction.	cum	139.00
<b>3.7</b>	<b>Excavation in Ordinary Rock using Hydraulic Excavator CK-90 and Tippers with disposal upto 1000 metres.</b> (Excavation for roadway in ordinary rock with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, transporting to embankment site within all lifts and lead upto 1000 m, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)		
(i)	Including Royalty @ ₹22.00 per cum but excluding the cost of watering, rolling & compaction.	cum	136.00
(ii)	Including Royalty @ ₹22.00 per cum and cost of watering, rolling & compaction.	cum	161.00
<b>3.8</b>	<b>Excavation in Hard Rock (blasting prohibited)</b> (Excavation for roadway in hard rock (blasting prohibited) with rock breakers including breaking rock, loading in tippers and disposal within all lifts and lead upto 1000 metres, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.)		
<b>A</b>	<b>Mechanised</b>	cum	552.00
<b>B</b>	<b>Manual Method</b>	cum	1007.00

  
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### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
3.9	<b>Excavation in Hard Rock (controlled blasting) with disposal upto 1000 metres</b> (Excavation for roadway in hard rock with controlled blasting by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres )	cum	610.00
3.10	<b>Excavation in Marshy Soil</b> (Excavation for roadway in marshy soil with hydraulic excavator 0.9 cum bucket capacity including cutting and loading in tippers and disposal with in all lifts and lead upto 1000 metres, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections.)		
(i)	Including Royalty @ ₹22.00 per cum but excluding the cost of watering, rolling & compaction.	cum	124.00
(ii)	Including Royalty @ ₹22.00 per cum and cost of watering, rolling & compaction.	cum	148.00
3.11	<b>Removal of Unserviceable Soil with Disposal upto 1000 metres</b> (Removal of unserviceable soil including excavation, loading and disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid separately as per clause 305.)	cum	93.70
3.12	<b>Pre-splitting of Rock Excavation Slopes</b> (Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by a 80 HP dozer, loading in tipper by a front end loader and disposing of the material with all lifts and lead upto 1000 m, all as specified in clause No. 303.)	sqm	249.00
3.13	<b>Excavation for Structures</b> (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)		
(i)	<b>Ordinary soil</b>		
A	<b>Manual Means (Depth upto 3 m)</b>	cum	250.00
B	<b>Mechanical Means (Depth upto 3 m)</b>	cum	54.00
(ii)	<b>Ordinary rock (not requiring blasting)</b>		
A	<b>Manual Means (Depth upto 3 m)</b>	cum	312.00
B	<b>Mechanical Means</b>	cum	72.10
(iii)	<b>Hard rock ( requiring blasting )</b>		
A	<b>Manual Means</b>	cum	792.00
(iv)	<b>Hard rock ( blasting prohibited )</b>		
A	<b>Mechanical Means</b>	cum	717.00
(v)	<b>Marshy soil</b>		
A	<b>Manual means ( upto 3 m depth)</b>	cum	496.00
B	<b>Mechanical Means</b>	cum	169.00
3.14	<b>Scarifying Existing Granular Surface to a Depth of 50 mm by Manual Means</b> (Scarifying the existing granular road surface to a depth of 50 mm and disposal of scarified material within all lifts and leads upto 1000 metres. )	sqm	26.20
3.15	<b>Scarifying existing bituminous surface to a depth of 50 mm by mechanical means</b> (Scarifying the existing bituminous road surface to a depth of 50 mm and disposal of scarified material with in all lifts and lead upto 1000 metres.)	sqm	7.20
3.16	<b>Embankment Construction with Material Obtained from Borrow Pits</b> (Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300-2.)		
(i)	Rolling with vibratory roller	cum	254.00
(ii)	Rolling with smooth wheeled roller	cum	244.00
3.17	<b>Construction of Embankment with Material Deposited from Roadway Cutting</b> (Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2.)		
(i)	Rolling with vibratory roller	cum	191.00
(ii)	Rolling with smooth wheeled roller	cum	180.00
3.18	<b>Construction of Subgrade and Earthen Shoulders</b> (Construction of subgrade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2.)		
(i)	Rolling with vibratory roller	cum	293.00

  
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### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
(ii)	Rolling with smooth wheeled roller	cum	280.00
<b>3.19</b>	<b>Compacting Original Ground</b>		
Case-I	<b>Compacting original ground supporting subgrade</b> (Loosening of the ground upto a level of 500 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction.)		
(i)	Rolling with vibratory roller	cum	85.60
(ii)	Rolling with smooth wheeled roller	cum	72.30
<b>Case-II</b>	<b>Compacting original ground supporting embankment</b>		
(i)	Rolling with vibratory roller	cum	50.40
(ii)	Rolling with smooth wheeled roller	cum	37.10
<b>3.20</b>	<b>Stripping and Storing Top Soil</b> (Stripping, storing of top soil by road side at 15 m internal and re-application on embankment slopes, cut slopes and other areas in localities where the available embankment material is not conducive to plant growth.)	cum	221.00
<b>3.21</b>	<b>Stripping, storing and re-laying top soil from borrow areas in agriculture fields.</b> (Stripping of top soil from borrow areas located in agriculture fields, storing at a suitable place, spreading and re-laying after taking the borrow earth to maintain fertility of the agricultural field, finishing it to the required levels and satisfaction of the farmer.)	cum	133.00
<b>3.22</b>	<b>Turfing with Sods</b> (Furnishing and laying of the live sods of perennial turf forming grass on embankment slope, verges or other locations shown on the drawing or as directed by the engineer including preparation of ground, fetching of rods and watering.)	sqm	57.10
<b>3.23</b>	<b>Seeding and Mulching</b> (Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of 0.23 litres per sqm and laying and fixing jute netting, including watering for 3 months all as per clause 308.)	sqm	191.00
<b>3.24</b>	<b>Surface Drains in Soil</b> (Construction of unlined surface drains of average cross sectional area 0.40 sqm in soil to specified lines, grades, levels and dimensions to the requirement of clause 301 and 309. Excavated material to be used in embankment within a lead of 50 metres (average lead 25 metres)		
<b>A</b>	<b>Mechanical means</b>	metre	83.10
<b>B</b>	<b>Manual Means</b>	metre	62.50
<b>3.25</b>	<b>Surface Drains in Ordinary Rock</b> (Construction of unlined surface drain of average cross sectional area 0.4 sqm in ordinary rock to specified lines, grades, levels and dimensions as per approved design and to the requirement of clause 301 to 309. Excavated material to be used in embankment at site.)		
<b>A</b>	<b>Mechanical Means</b>	metre	169.00
<b>B</b>	<b>Manual Means</b>	metre	93.70
<b>3.26</b>	<b>Surface Drains in Hard Rock</b> (Rate per metre may be worked out based on quantity of hard rock as per design.)	metre	-
<b>3.27</b>	<b>Sub Surface Drains with Perforated Pipe</b> (Construction of subsurface drain with perforated pipe of 100 mm internal diameter of metal/asbestos cement/cement concrete/ PVC, closely jointed, perforations ranging from 3 mm to 6 mm depending upon size of material surrounding the pipe, with 150 mm bedding below the pipe and 300 mm cushion above the pipe, cross section of excavation 450 x 550 mm. Excavated material to be utilised in roadway at site. )	metre	300.00
<b>3.28</b>	<b>Aggregate Sub- Surface Drains</b> (Construction of aggregate sub surface drain 300 mm x 450 mm with aggregates conforming to table 300-4, excavated material to be utilised in roadway. )	metre	110.00
<b>3.29</b>	<b>Underground Drain at Edge of Pavement</b> (Construction of an underground drain 1 m x 1 m (inside dimensions) lined with RCC-20 cm thick and covered with RCC slab 10 cm in thickness on urban roads.)	metre	2098.00
<b>3.30</b>	<b>Preparation and Surface Treatment of formation.</b> (Preparation and surface treatment of formation by removing mud and slurry, watering to the extent needed to maintain the desired moisture content, trimming to the required line, grade, profile and rolling with 8-10 tonne smooth wheeled roller, complete as per clause 310.)	sqm	3.10
<b>3.31</b>	<b>Construction of Rock fill Embankment</b> (Construction of rock fill embankment with broken hard rock fragments of size not exceeding 300 mm laid in layers not exceeding 500 mm thick including filling of surface voids with stone spalls, blinding top layer with granular material, rolled with vibratory road roller, all complete as per clause 313.)	cum	100.70
<b>3.32</b>	<b>Excavation in Hill Area in Soil by Mechanical Means</b> (Excavation in soil in hilly area by mechanical means including cutting and trimming of side slopes and disposing of excavated earth with all lifts and lead upto 1000 metres.)	cum	250.00
<b>3.33</b>	<b>Excavation in Hilly Area in Ordinary Rock by Mechanical Means not Requiring Blasting.</b> (Excavation in hilly area in ordinary rock not requiring ballasting by mechanical means including cutting and trimming of slopes and disposal of cut material with all lift and lead upto 1000 metres. )	cum	360.00

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
3.34	<b>Excavation in Hilly Areas in Hard Rock Requiring Blasting</b> (Excavation in hilly areas in hard rock requiring blasting, by mechanical means including trimming of slopes and disposal of cut material with all lifts and lead upto 1000 metres.)	cum	578.00
3.35	<b>Work in Urban Roads</b> (The cost of earth work in urban roads inhabited area will be comparatively higher due to <b>following reasons</b> .)		-
3.36	<b>Embankment Construction with Fly ash/Pond ash available from coal or lignite burning Thermal Plants as waste material.</b> (Construction of embankment with fly ash conforming to table 1 of IRC: SP: 58 - 2001 obtained from coal or lignite burning thermal power stations as waste material, spread and compacted in layer of 200mm thickness each at OMC, all as specified in IRC: SP: 58-2001 and as per approved plans.)	cum	150.00

  
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Analysis of Rates  
CHAPTER - 3  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
3.1	301	<b>Excavation in Soil by Manual Means</b>					
		Excavation for roadway in soil using manual means including loading in truck for carrying of cut earth to embankment site with all lifts and lead upto 1000 metres.					
		<b>Unit = cum</b>					
		<b>Taking output = 120 cum</b>					
		<b>a) Labour</b>					
		Mate	day	1.800	272.00	489.60	L-12
		Mazdoor	day	45.000	257.00	11565.00	L-13
		<b>b) Machinery</b>					
		Truck 5.5 cum capacity	hour	10.000	929.00	9290.00	P&M-057
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				1280.68	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2262.53	
		Cost of 120 cum = a+b+c+d				24887.80	
		<b>Rate per cum = (a+b+c+d)/120</b>				207.40	
	(i)	<b>Royalty @ ₹22.00 per Cum</b>				22.00	
		<b>Rate per cum</b>			say	229.00	
	(ii)	<b>Including Royalty @ ₹22.0 per cum and cost of watering, rolling &amp; compaction</b>				254.00	Sub_Analysis
		<b>Rate per cum</b>			say	254.00	
	Note	In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, the item of carriage in the truck shall be omitted.				229.00	Sub_Analysis
		<b>Rate per cum</b>			say	229.00	
3.2	301	<b>Excavation in Ordinary Rock by Manual Means</b>					
	(i)	Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with in all lifts and leads upto 1000 metres including Royalty but excluding watering, rolling & compaction.					
		<b>Unit = cum</b>					
		<b>Taking output = 120 cum</b>					
		<b>a) Labour</b>					
		Mate	day	2.800	272.00	761.60	L-12
		Mazdoor	day	70.000	257.00	17990.00	L-13
		<b>b) Machinery</b>					
		Truck 5.5 cum capacity	hour	10.000	929.00	9290.00	P&M-057
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				1682.50	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2972.41	
		Cost for 120 cum = a+b+c+d				32696.51	
		<b>Rate per cum = (a+b+c+d)/120</b>				272.47	
		<b>Royalty @ ₹22.00 per Cum</b>				22.00	
		<b>Rate per cum</b>				294.47	
					say	294.00	
	(ii)	<b>Including royalty @ ₹22.00 per cum and watering, rolling &amp; compaction.</b>				319.00	Sub_Analysis
	Note	In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, <u>the item of carriage in the truck shall be omitted</u> . Including royalty @ ₹22.00 per cum.				294.00	Sub_Analysis
3.3	301	<b>Excavation in Soil with Dozer with lead upto 100 metres</b>					
		Excavation for road way in soil by mechanical means including cutting and pushing the earth to site of embankment upto a distance of 100 metres (average lead 50 metres), including trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.					
		<b>Unit = cum</b>					
		<b>Taking output = 180 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13

Analysis of Rates  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Dozer, 80 HP @ 30 cum per hour	hour	6.000	5598.00	33588.00	P&M-014
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				2047.43	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				3617.12	
		Cost for 180 cum = a+b+c+d				39788.30	
		<b>Rate per cum = (a+b+c+d)/180</b>				221.05	
					<b>say</b>	<b>221.00</b>	
3.4	301	<b>Excavation in Ordinary Rock with Dozer with lead upto 100 metres</b>					
		Excavation for roadway in ordinary rock by deploying a dozer, 80 HP including cutting and pushing the cut earth to site of embankment upto a distance of 100 metres ( average lead 50 metres ), trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections.					
		<b>Unit = cum</b>					
		<b>Taking output = 108 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		<b>b) Machinery</b>					
		Dozer, 80 HP @ 20 cum per hour	hour	6.000	5598.00	33588.00	P&M-014
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				2063.50	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				3645.51	
		Cost for 108 cum = a+b+c+d				40100.65	
		<b>Rate per cum = (a+b+c+d)/108</b>				371.30	
					<b>say</b>	<b>371.00</b>	
3.5	301	<b>Excavation in Hard Rock (requiring blasting) with disposal upto 1000 metres</b>					
		Excavation for roadway in hard rock (requiring blasting) by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres.					
		<b>Unit = cum</b>					
		<b>Taking Output = 180 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.220	272.00	59.84	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		Driller	day	2.000	307.00	614.00	L-06
		Blaster	day	0.250	425.00	106.25	L-03
		<b>b) Machinery</b>					
		Dozer, 80 HP @ 30 cum per hour	hour	6.000	5598.00	33588.00	P&M-014
		Air compressor, 250 cfm with 2 jack hammer	hour	6.000	481.00	2886.00	P&M-001
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	hour	11.250	1018.00	11452.50	P&M-048
		<b>c) Materials</b>					
		Gelatin 80 per cent	kg	63.000	781.83	49255.29	M-104
		Electric Detonators @ 1 detonator for 2 gelatin sticks of 125 gms each	each	252.000	5.73	1443.61	M-094 /100
		Credit for excavated rock found suitable for use @ 50 per cent quantity blasted	cum	90.000	-222.81	-20052.90	M-089
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				5301.70	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				9366.33	
		Cost for 180 cum = a+b+c+d+e				103029.61	
		<b>Rate per cum = (a+b+c+d+e)/180</b>				572.39	
					<b>say</b>	<b>572.00</b>	
		<b>Note</b> 1. The quality and availability of rock shall be checked before affording credit.					
		2. In case some rock is issued to the contractor at site, the item of carriage shall be reduced/restricted to that extent.					

Calc.  
12/8/19

Analysis of Rates  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
3.6	301		<b>Excavation in Soil using Hydraulic Excavator CK 90 and Tipplers with Disposal upto 1000 metres.</b>					
		(i)	Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tipplers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m (Including royalty @ ₹22.00 per cum but excluding watering, rolling & compaction.)					
			<b>Unit = cum</b>					
			<b>Taking output = 360 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.080	272.00	21.76	L-12
			Mazdoor	day	2.000	257.00	514.00	L-13
			<b>b) Machinery</b>					
			Hydraulic excavator 0.9 cum bucket capacity @ 60 cum per hour	hour	6.000	1958.00	11748.00	P&M-026
			Tipper 5.5 cum capacity, 4 trips per hour	hour	16.000	1018.00	16288.00	P&M-048
			<b>c) Overhead charges @ 0.06 on (a+b)</b>				1714.31	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				3028.61	
			Cost for 360 cum = a+b+c+d				33314.67	
			<b>Rate per cum = (a+b+c+d)/360</b>				92.54	
			<b>Royalty @ ₹22.00 per Cum</b>				<b>22.00</b>	
			<b>Rate per cum</b>				114.54	
						<b>say</b>	<b>115.00</b>	
		(ii)	Including royalty @ ₹22.00 per cum and watering, rolling & compaction.				<b>139.00</b>	Sub_Analysis
3.7	301		<b>Excavation in Ordinary Rock using Hydraulic Excavator CK-90 and Tipplers with Disposal upto 1000 metres.</b>					
		(i)	Excavation for roadway in ordinary rock with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tipplers, transporting to embankment site within all lifts and lead upto 1000 m, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections (Including royalty @ ₹22.00 per cum but excluding watering, rolling & compaction)					
			<b>Unit = cum</b>					
			<b>Taking output = 240 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.080	272.00	21.76	L-12
			Mazdoor	day	2.000	257.00	514.00	L-13
			<b>b) Machinery</b>					
			Hydraulic Excavator 0.90 cum bucket capacity @ 36 cum per hour	hour	6.000	1958.00	11748.00	P&M-026
			Tipper 5.5 cum capacity, 4 trips per hour.	hour	11.000	1018.00	11198.00	P&M-048
			<b>c) Overhead charges @ 0.06 on (a+b)</b>				1408.91	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2489.07	
			Cost for 240 cum = a+b+c+d				27379.73	
			<b>Rate per cum = (a+b+c+d)/240</b>				114.08	
			<b>Royalty @ ₹22.00 per Cum</b>				<b>22.00</b>	
			<b>Rate per cum</b>				136.08	
						<b>say</b>	<b>136.00</b>	
		(ii)	Including royalty @ ₹22.00 per cum and watering, rolling & compaction.				<b>161.00</b>	Sub_Analysis

Analysis of Rates  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
3.8	301	<b>Excavation in Hard Rock (blasting prohibited)</b>					
		Excavation for roadway in hard rock (blasting prohibited) with rock breakers including breaking rock, loading in tippers and disposal within all lifts and lead upto 1000 metres, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections.					
	<b>A</b>	<b>Mechanised</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 36 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.400	272.00	108.80	L-12
		Mazdoor for trimming slopes including manual loading in truck	day	10.000	257.00	2570.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator with rock breaker attachment @ 6 cum per hour	hour	6.000	1958.00	11748.00	P&M-026
		Tipper 5.5 cum capacity, 1 trip per hour.	hour	6.500	1018.00	6617.00	P&M-048
		Credit for excavated rock found suitable for use @ 50 per cent of excavated quantity	cum	18.000	-222.81	-4010.58	M-089
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				1021.99	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1805.52	
		Cost for 36 cum = a+b+c+d				19860.73	
		<b>Rate per cum = (a+b+c+d)/36</b>				551.69	
					<b>say</b>	<b>552.00</b>	
	<b>Note</b>	1. The quality and availability of rock shall be checked before affording credit.					
		2. In case some rock is issued to the contractor at site, the item of carriage shall be restricted/reduced to that extent.					
		3. Being small quantity, manual loading will be economical in this case and has been provided accordingly.					
3.8	<b>B</b>	<b>Manual Method</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 16 cum</b>					
		<b>a) Labour</b>					
		Mate	day	1.640	272.00	446.08	L-12
		Mazdoor including loading in truck	day	16.000	257.00	4112.00	L-13
		Chiseller	day	24.000	323.00	7752.00	L-05
		Blacksmith	day	1.000	345.00	345.00	L-02a
		<b>b) Machinery</b>					
		Tipper 5.5 cum capacity, 1 trip per hour.	hour	2.900	1018.00	2952.20	P&M-048
		Credit for excavated rock found suitable for use @ 50 per cent of excavated	cum	8.000	-222.81	-1782.48	M-089
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				829.49	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1465.43	
		Cost for 16 cum = a+b+c+d				16119.72	
		<b>Rate per cum = (a+b+c+d)/16</b>				1007.48	
					<b>say</b>	<b>1007.00</b>	
	<b>Note</b>	1. Credit is considered for 50 per cent of quantity of work.					
		2. Loading for disposal will be done manually, being small quantity.					
		3. In case some rock is issued to contractor at site, the item of carriage shall be omitted to the extent of quantity issued to the contractor.					
3.9	301	<b>Excavation in Hard Rock (controlled blasting) with disposal upto 1000 metres</b>					

Calc.  
12/3/19



Analysis of Rates  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		Excavation for roadway in hard rock with controlled blasting by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres.					
		<b>Unit = cum</b>					
		<b>Taking output = 180 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.220	272.00	59.84	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		Driller	day	2.000	307.00	614.00	L-06
		Blaster	day	0.500	425.00	212.50	L-03
		<b>b) Machinery</b>					
		Dozer 80 HP @ 30 cum per hour	hour	6.000	5598.00	33588.00	P&M-014
		Air compressor, 250 cfm with 2 jack hammers	hour	6.000	481.00	2886.00	P&M-001
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	8.200	1018.00	8347.60	P&M-048
		<b>c) Materials</b>					
		Gelatin 80 per cent	kg	63.000	781.83	49255.29	M-104
		Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	each	1008.000	5.73	5774.43	M-094 /100
		Credit for excavated rock found suitable for use @ 50 per cent quantity blasted	cum	90.000	-222.81	-20052.90	M-089
		<b>Add 5 per cent of cost of a+b+c towards muffling arrangements to guard against any rock fly off during blasting</b>				4484.69	
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				5650.71	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				9982.92	
		Cost for 180 cum = a+b+c+d+e				109812.07	
		<b>Rate per cum = (a+b+c+d+e)/180</b>				610.07	
					<b>say</b>	<b>610.00</b>	
		<b>Note</b>					
		1. Credit is considered for 50 per cent of quantity of blasted rock, if found suitable for construction.					
		2. In case some rock is issued to the contractor at site, the item of carriage shall be reduced to that extent.					
3.10	301	<b>Excavation in Marshy Soil</b>					
	(i)	Excavation for roadway in marshy soil with hydraulic excavator 0.9 cum bucket capacity including cutting and loading in tippers and disposal with in all lifts and lead upto 1000 metres, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections (Including royalty @ ₹22.00 per cum but excluding watering, rolling & compaction)					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 0.90 cum bucket capacity @ 50 cum per hour	hour	6.000	1958.00	11748.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	13.640	1018.00	13885.52	P&M-048
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				1570.16	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2773.94	
		Cost for 300 cum = a+b+c+d				30513.38	
		<b>Rate per cum = (a+b+c+d)/300</b>				101.71	
		<b>Royalty @ ₹22.00 per Cum</b>				22.00	
		<b>Rate per cum</b>				123.71	
					<b>say</b>	<b>124.00</b>	

Analysis of Rates  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		(ii) Including royalty @ ₹22.00 per cum and watering, rolling & compaction.				<u>148.00</u>	Sub_Analysis
3.11	301	Removal of Unserviceable Soil with Disposal upto 1000 metres					
		Removal of unserviceable soil including excavation, loading and disposal upto 1000 metres lead but excluding replacement by suitable soil which shall be paid separately as per clause 305.					
		Unit = cum					
		Taking output = 360 cum					
		a) Labour					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		b) Machinery					
		Excavator 0.90 cum bucket capacity @ 60 cum per hour	hour	6.000	1958.00	11748.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.360	1018.00	16654.48	P&M-048
		c) Overhead charges @ 0.06 on (a+b)				1736.29	
		d) Contractor's profit @ 0.1 on (a+b+c)				3067.45	
		Cost for 360 cum = a+b+c+d				33741.99	
		Rate per cum = (a+b+c+d)/360				93.73	
					say	<u>93.70</u>	
		Note This item does not include replacement of unsuitable soil by suitable soil. Replacement, where required, is to be provided and paid separately under clause 305.					
3.12	303	Presplitting of Rock Excavation Slopes					
		Carrying out excavation in hard rock to achieve a specified slope of the rock face by controlled use of explosives and blasting accessories in properly aligned and spaced drill holes, collection of the excavated rock by a 80 HP dozer, loading in tipper by a front end loader and disposing of the material with all lifts and lead upto 1000 m, all as specified in Clause No. 303.					
		Unit = sqm					
		Taking output = 400 sqm (120 cum considering 300mm average depth of excavation over the existing rock face)					
		a) Labour					
		Mate	day	0.600	272.00	163.20	L-12
		Mazdoor	day	15.000	257.00	3855.00	L-13
		b) Machinery					
		Air compressor 250 cfm with 2 leads @ 20 cum per hour	hour	6.000	481.00	2886.00	P&M-001
		Dozer, 80 HP	hour	6.000	5598.00	33588.00	P&M-014
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		c) Materials					
		Gelatin 80 per cent	kg	42.000	781.83	32836.86	M-104
		Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	each	672.000	5.73	3849.62	M-094 /100
		d) Overhead charges @ 0.06 on (a+b+c)				5125.00	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				9054.17	
		Cost for 400 sqm = a+b+c+d+e				99595.85	
		Rate per sqm = (a+b+c+d+e)/400				248.99	
					say	<u>249.00</u>	
		Note In case blasted rock is used to the contractor against payment for constructed work, the cost of carriage shall be reduced to that extent.					
3.13	304	Excavation for Structures					

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Analysis of Rates  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.					
	(i)	<b>Ordinary soil</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
	A	<b>Manual Means (Depth upto 3 m)</b>					
		a) Labour					
		Mate	day	0.320	272.00	87.04	L-12
		Mazdoor	day	8.000	257.00	2056.00	L-13
		b) Overhead charges @ 0.06 on (a)				128.58	
		c) Contractor's profit @ 0.1 on (a+b)				227.16	
		Cost for 10 cum = a+b+c				2498.78	
		Rate per cum = (a+b+c)/10				249.88	
					say	<u>250.00</u>	
	Note	Cost of dewatering may be added where required upto 10 per cent of labour cost Assessment for dewatering shall be made as per site conditions.					
3.13 (i)	B	<b>Mechanical Means (Depth upto 3 m)</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 300 cum</i>					
		a) Labour					
		Mate	day	0.320	272.00	87.04	L-12
		Mazdoor	day	8.000	257.00	2056.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.000	1958.00	11748.00	P&M-026
		c) Overhead charges @ 0.06 on (a+b)				833.46	
		d) Contractor's profit @ 0.1 on (a+b+c)				1472.45	
		Cost for 300 cum = a+b+c+d				16196.95	
		Rate per cum = (a+b+c+d)/300				53.99	
					say	<u>54.00</u>	
	Note	Cost of dewatering upto 5 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions.					
3.13	(ii)	<b>Ordinary Rock (not requiring blasting)</b>					
	A	<b>Manual Means (Depth upto 3 m)</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		a) Labour					
		Mate	day	0.400	272.00	108.80	L-12
		Mazdoor	day	10.000	257.00	2570.00	L-13
		b) Overhead charges @ 0.06 on (a)				160.73	
		c) Contractor's profit @ 0.1 on (a+b)				283.95	
		Cost for 10 cum = a+b+c				3123.48	
		Rate per cum = (a+b+c)/10				312.35	
					say	<u>312.00</u>	
	Note	Cost of dewatering upto 10 per cent of labour cost may be added, where required. Assessment for dewatering shall be made as per site conditions.					
3.13 (ii)	B	<b>Mechanical Means</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 216 cum</i>					
		a) Labour					

Analysis of Rates  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	0.240	272.00	65.28	L-12
		Mazdoor	day	6.000	257.00	1542.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.000	1958.00	11748.00	P&M-026
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				801.32	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1415.66	
		Cost for 216 cum = a+b+c+d				15572.26	
		<b>Rate per cum = (a+b+c+d)/216</b>				72.09	
					<b>say</b>	<b>72.10</b>	
		<b>Note</b>					
		1. Cost of dewatering upto 5 per cent of (a+b), may be added, where required Assessment for dewatering shall be made as per site conditions.					
		2. In case of rock, foundation beyond 3 m is not dug and hence not included.					
3.13	(iii)	<b>Hard Rock ( requiring blasting )</b>					
	<b>A</b>	<b>Manual Means</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 10 cum</b>					
		<b>a) Labour</b>					
		i) Mate	day	0.530	272.00	144.16	L-12
		ii) Driller	day	0.840	307.00	257.88	L-06
		iii) Blaster	day	0.400	425.00	170.00	L-03
		iv) Mazdoor	day	12.000	257.00	3084.00	L-13
		<b>b) Machinery</b>					
		Air Compressor 250 cfm with 2 jack hammer @ 15 cum per hour	hour	0.67	481.00	322.27	P&M-001
		<b>c) Material</b>					
		Blasting Material	kg	3.500	781.83	2736.41	M-104
		Detonator electric	each	14.000	5.73	80.20	M-094 /100
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				407.69	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				720.26	
		Cost for 10 cum = a+b+c+d+e				7922.87	
		<b>Rate per cum = (a+b+c+d+e)/10</b>				792.29	
					<b>say</b>	<b>792.00</b>	
		<b>Note</b>					
		Cost of dewatering @ 10 per cent of labour cost may be added, where required. Assessment for dewatering shall be made as per site conditions.					
3.13	(iv)	<b>Hard Rock ( blasting prohibited )</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 10 cum</b>					
	<b>A</b>	<b>Mechanical Means</b>					
		<b>a) Labour</b>					
		Mate	day	0.200	272.00	54.40	L-12
		Mazdoor	day	5.000	257.00	1285.00	L-13
		<b>b) Machinery</b>					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1 cum per hour	hour	10.000	481.00	4810.00	P&M-001
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				368.96	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				651.84	
		Cost for 10 cum = a+b+c+d				7170.20	
		<b>Rate per cum = (a+b+c+d)/10</b>				717.02	
					<b>say</b>	<b>717.00</b>	
		<b>Note</b>					
		1. Cost of dewatering upto 5 per cent of (a+b), may be added, where required. Assessment for dewatering shall be made as per site conditions.					
		2. In case of rock, foundation beyond 3 m is not dug and hence not included.					

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Analysis of Rates  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
3.13		(v)	Marshy soil					
			Unit = cum					
			Taking output = 10 cum					
		A	Manual means ( upto 3 m depth)					
			a) Labour					
			Mate/Supervisor	day	0.400	272.00	108.80	L-12
			Mazdoor	day	10.000	257.00	2570.00	L-13
			b) Machinery					
			Tractor-trolley	hour	2.670	546.00	1457.82	P&M-053
			c) Material					
			Selected earth for refilling	cum	5.000	23.78	118.90	M-163
			d) Overhead charges @ 0.06 on (a+b+c)				255.33	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				451.09	
			Cost for 10 cum = a+b+c+d+e				4961.94	
			Rate per cum = ( a+b+c+d+e)/ 10				496.19	
						say	<u>496.00</u>	
		Note	1. Cost of dewatering @ 30 per cent of (a), may be added, where required Assessment for dewatering shall be made as per site conditions.					
			2. Shoring & strutting 20 per cent of (a), where required may be added.					
			3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item (i) to (iv) for ordinary soil.					
3.13 (v)		B	Mechanical Means					
			a) Labour					
			i) Mate	day	0.080	272.00	21.76	L-12
			ii) Mazdoor for dressing sides, bottom and backfilling	day	2.000	257.00	514.00	L-13
			b) Machinery					
			Hydraulic excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.170	1958.00	332.86	P&M-026
			Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.450	1018.00	458.10	P&M-048
			c) Material					
			Selected earth for refilling	cum	5.000	23.78	118.90	M-163
			d) Overhead charges @ 0.06 on (a+b+c)				86.74	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				153.24	
			Cost for 10 cum = a+b+c+d+e				1685.59	
			Rate per cum = (a+b+c+d+e)/10				168.56	
						say	<u>169.00</u>	
		Note	1. Cost of dewatering @ 20 per cent of (a+b) may be added, where required.					
			2. Shoring & strutting @ 10 per cent of (a+b), where required may be added.					
			3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item (i) to (iv) for ordinary soil.					
3.14	305.4.3		Scarifying Existing Granular Surface to a Depth of 50 mm by Manual Means					
			Scarifying the existing granular road surface to a depth of 50 mm and disposal of scarified material within all lifts and leads upto 1000 metres.					
			Unit = sqm					
			Taking output = 100 sqm					
			a) Labour					
			Mate	day	0.200	272.00	54.40	L-12
			Mazdoor including loading and unloading	day	5.000	257.00	1285.00	L-13
			b) Machinery					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		Tractor-trolley	hour	1.670	546.00	911.82	P&M-053
		c) Overhead charges @ 0.06 on (a+b)				135.07	
		d) Contractor's profit @ 0.1 on (a+b+c)				238.63	
		Cost for 100 sqm = a+b+c+d				2624.92	
		Rate per sqm = (a+b+c+d)/100				26.25	
					say	<u>26.20</u>	
		<b>Note</b> In case material is to be reused at site, transportation cost catered above for disposal shall be deleted.					
3.15	305.4.3	<b>Scarifying Existing Bituminous Surface to a depth of 50 mm by Mechanical Means</b>					
		Scarifying the existing bituminous road surface to a depth of 50 mm and disposal of scarified material with in all lifts and lead upto 1000 metres.					
		Unit = sqm					
		Taking output = 100 sqm					
		a) Labour					
		Mate	day	0.010	272.00	2.72	L-12
		Mazdoor	day	0.250	257.00	64.25	L-13
		b) Machinery					
		Tractor with ripper attachment @ 60 cum per hour	hour	0.080	558.00	44.64	P&M-055
		Front end loader 1 cum bucket capacity @ 25 cum per hour	hour	0.200	1373.00	274.60	P&M-017
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.230	1018.00	234.14	P&M-048
		c) Overhead charges @ 0.06 on (a+b)				37.22	
		d) Contractor's profit @ 0.1 on (a+b+c)				65.76	
		Cost for 100 sqm = a+b+c+d				723.33	
		Rate per sqm = (a+b+c+d)/100				7.23	
					say	<u>7.20</u>	
3.16	305	<b>Construction of Embankment with Material obtained from Borrowpits</b>					
		(i) Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300-2.					
		Unit = cum					
		a) Labour					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor	day	1.000	257.00	257.00	L-13
		b) Machinery					
		Hydraulic Excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1958.00	3269.86	P&M-026
		Tipper 10 tonne capacity	tonne.km	160 x L	8.86	1417.60	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				141.76	
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	5598.00	2799.00	P&M-014
		Motor grader for grading @ 100 cum per hour	hour	1.000	2697.00	2697.00	P&M-032
		Water tanker 6 KL capacity	hour	4.000	183.00	732.00	P&M-060
		Vibratory roller 8 -10 tonnes @ 100 cum per hour	hour	1.000	2029.00	2029.00	P&M-059
		c) Material					
		Cost of water	KL	24.000	253.69	6088.56	M-189
		Compensation & Royalty for earth taken from private land	cum	100.000	23.78	2378.00	M-092
		d) Overhead charges @ 0.06 on (a+b+c)				1309.24	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				2312.99	
		Cost for 100 cum = a+b+c+d+e				25442.89	
		Rate per cum = (a+b+c+d+e)/100				254.43	
		(i) Rolling with vibratory roller			say	<u>254.00</u>	

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**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		<b>Note</b>	Compensation for earth will vary from place to place and will have to be assessed realistically as per particular ground situation. In case earth is available from Govt. land, compensation for earth will not be required. The position is required to be clearly stated in the cost estimate.					
		<b>(ii)</b>	<b>Rolling with smooth wheeled roller</b>				<b>244.00</b>	Sub_Analysis
3.17	305		<b>Construction of Embankment with Material Deposited from Roadway Cutting</b>					
			Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2.					
			<b>Unit = cum</b>					
			<b>Taking output = 100 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.020	272.00	5.44	L-12
			Mazdoor	day	0.500	257.00	128.50	L-13
			<b>b) Machinery</b>					
			Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	5598.00	2799.00	P&M-014
			Motor grader for grading @ 100 cum per hour	hour	1.000	2697.00	2697.00	P&M-032
			Water tanker 6 KL capacity	hour	4.000	183.00	732.00	P&M-060
			Vibratory roller 8-10 tonnes @ 100 cum per hour	hour	1.000	2029.00	2029.00	P&M-059
			<b>c) Material</b>					
			Cost of water	KL	24.000	253.69	6088.56	M-189
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				868.77	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1534.83	
			Rate for 100 cum = a+b+c+d+e				16883.10	
			<b>Rate per cum = (a+b+c+d+e)/100</b>				168.83	
			<b>Royalty @ ₹22.00 per Cum</b>				22.00	
		<b>(i)</b>	<b>Rolling with vibratory roller</b>			say	<b>191.00</b>	
		<b>Note</b>	In case the earth cutting is done by dozer and pushed for filling in the embankment, the input of dozer in the cost of embankment shall be deleted as the same is already provided in the cost of excavation. However, if the earth is dumped by tippers from roadway cutting, the input of dozer for spreading is required to be provided.					
		<b>(ii)</b>	<b>Rolling with smooth wheeled roller</b>				<b>180.00</b>	Sub_Analysis
3.18	305		<b>Construction of Subgrade and Earthen Shoulders</b>					
			Construction of sub-grade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2.					
			<b>Unit = cum</b>					
			<b>Taking output = 100 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.040	272.00	10.88	L-12
			Mazdoor	day	1.000	257.00	257.00	L-13
			<b>b) Machinery</b>					
			Hydraulic excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1958.00	3269.86	P&M-026
			Tipper 10 tonne capacity	tonne.km	175xL	8.86	1550.50	Lead =1 km & P&M-047
			<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>155.05</b>	



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**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	5598.00	2799.00	P&M-014
		Motor grader for grading @ 50 cum per hour	hour	2.000	2697.00	5394.00	P&M-032
		Water tanker with 6 km lead	hour	4.000	183.00	732.00	P&M-060
		Vibratory roller 8-10 tonnes @ 80 cum per hour	hour	1.250	2029.00	2536.25	P&M-059
		<b>c) Material</b>					
		Cost of water	KL	24.000	253.69	6088.56	M-189
		Compensation & Royalty for earth taken from private land	cum	100.000	23.78	2378.00	M-092
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				1510.27	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				2668.14	
		Cost for 100 cum = a+b+c+d+e				29349.50	
		<b>Rate per cum = (a+b+c+d+e)/100</b>				293.50	
		<b>(i) Rolling with vibratory roller</b>			<b>say</b>	<b>293.00</b>	
		<b>(ii) Rolling with smooth wheeled roller</b>				<b>280.00</b>	Sub_Analysis
<b>3.19</b>	<b>305.3.4</b>	<b>Compacting Original Ground</b>					
		<b>Case-I Compacting original ground supporting sub-grade</b>					
		Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers to meet requirement of table 300-2 for sub-grade construction.					
		<b>Unit = cum</b>					
		<b>Taking output = 600 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		<b>b) Machinery</b>					
		Tractor with ripper attachment	hour	9.000	558.00	5022.00	P&M-055
		Motor grader for grading	hour	6.000	2697.00	16182.00	P&M-032
		Water tanker 6 KL capacity	hour	4.000	183.00	732.00	P&M-060
		Vibratory roller 8-10 tonne @ 80 cum/hour	hour	7.500	2029.00	15217.50	P&M-059
		<b>c) Material</b>					
		Cost of water	KL	24.000	253.69	6088.56	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				2642.74	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				4668.84	
		Cost for 600 cum = a+b+c+d+e				51357.29	
		<b>Rate per cum = (a+b+c+d+e)/600</b>				85.60	
		<b>(i) Rolling with vibratory roller</b>			<b>say</b>	<b>85.60</b>	
		<b>(ii) Rolling with smooth wheeled roller</b>				<b>72.30</b>	Sub_Analysis
<b>3.19</b>		<b>Case-II Compacting original ground supporting embankment</b>					
		Loosening, leveling and Compacting original ground supporting embankment to facilitate placement of first layer of embankment, scarified to a depth of 150 mm, mixed with water at OMC and then compacted by rolling so as to achieve minimum dry density as given in Table 300-2 for embankment construction.					
		<b>Unit = cum</b>					
		<b>Taking output = 600 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Tractor with ripper attachment	hour	6.000	558.00	3348.00	P&M-055
		Vibratory road roller 8-10 tonne capacity	hour	7.500	2029.00	15217.50	P&M-059

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		Water tanker 6 KL capacity	hour	4.000	183.00	732.00	P&M-060
		<b>c) Material</b>					
		Cost of water	KL	24.000	253.69	6088.56	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				1555.31	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				2747.71	
		Cost for 600 cum = (a+b+c+d+e)				30224.84	
		<b>Rate per cum = (a+b+c+d+e)/600</b>				50.37	
	(i)	<b>Rolling with vibratory roller</b>			say	<b>50.40</b>	
	(ii)	<b>Rolling with smooth wheeled roller</b>				<b>37.10</b>	Sub_Analysis
3.20	305	<b>Stripping and Storing Top Soil</b>					
		Stripping, storing of top soil by road side at 15 m internal and re-application on embankment slopes, cut slopes and other areas in localities where the available embankment material is not conducive to plant growth.					
		<b>Unit = cum</b>					
		<b>Taking output = 10 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.200	272.00	54.40	L-12
		Mazdoor	day	5.000	257.00	1285.00	L-13
		<b>b) Machinery</b>					
		Dozer 80 HP @ 100 cum per hour	hour	0.100	5598.00	559.80	P&M-014
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				113.95	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				201.32	
		Cost for 10 cum = (a+b+c+d)				2214.47	
		<b>Rate per cum = (a+b+c+d)/10</b>				221.45	
					say	<b>221.00</b>	
3.21		<b>Stripping, Storing and Re-laying Top Soil from Borrow Areas in Agriculture Fields.</b>					
		Stripping of top soil from borrow areas located in agriculture fields, storing at a suitable place, spreading and re-laying after taking the borrow earth to maintain fertility of the agricultural field, finishing it to the required levels and satisfaction of the farmer.					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Dozer, 80 HP	hour	6.000	5598.00	33588.00	P&M-014
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				2047.43	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				3617.12	
		Cost for 300 cum = (a+b+c+d)				39788.30	
		<b>Rate per cum = (a+b+c+d)/300</b>				132.63	
					say	<b>133.00</b>	
3.22	307	<b>Turfing with Sods</b>					
		Furnishing and laying of the live sods of perennial turf forming grass on embankment slope, verges or other locations shown on the drawing or as directed by the engineer including preparation of ground, fetching of sods and watering.					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12

Analysis of Rates  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost( ₹)	Remarks/ Input ref.
		Mazdoor for preparation of ground and fetching of sods	day	3.000	257.00	771.00	L-13
		<b>b) Machinery</b>					
		Water tanker including watering for 3 months	hour	2.000	183.00	366.00	P&M-060
		Tractor-trolley	hour	1.000	546.00	546.00	P&M-053
		<b>c) Material</b>					
		Farm yard manure @ 0.18 cum per 100 sqm at site of work	cum	0.180	761.11	137.00	M-167
		Cost of water	KL	12.000	253.69	3044.28	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				293.82	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				519.07	
		Cost for 100 sqm = a+b+c+d+e				5709.81	
		<b>Rate per 100 sqm = (a+b+c+d+e)/100</b>				57.10	
					<b>say</b>	<b>57.10</b>	
<b>3.23</b>	<b>308</b>	<b>Seeding and Mulching</b>					
		Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of 0.23 litres per sqm and laying and fixing jute netting, including watering for 3 months all as per clause 308.					
		<b>Unit = sqm</b>					
		<b>Taking output = 240 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.400	272.00	108.80	L-12
		Mazdoor	day	10.000	257.00	2570.00	L-13
		<b>b) Machinery</b>					
		Water tanker 6 KL capacity including watering for 3 months	hour	14.000	183.00	2562.00	P&M-060
		Tractor-trolley	hour	2.400	546.00	1310.40	P&M-053
		<b>c) Material</b>					
		Seeds	kg	3.600	33.83	121.79	M-162
		Sludge/Farm yard manure @ 0.18 cum per 100 sqm	cum	0.430	761.11	327.28	M-167
		Bitumen Emulsion	litre	55.200	39.475	2179.02	M-077
		Jute netting, open weave, 2.5 cm square opening	sqm	264.000	33.66	8886.24	M-121
		Cost of water for 3 months	KL	84.000	253.69	21309.96	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				2362.53	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				4173.80	
		Cost for 240 sqm = a+b+c+d+e				45911.82	
		<b>Rate per sqm = (a+b+c+d+e)/240</b>				191.30	
					<b>say</b>	<b>191.00</b>	
<b>3.24</b>	<b>309</b>	<b>Surface Drains in Soil</b>					
		Construction of unlined surface drains of average cross sectional area 0.40 sqm in soil to specified lines, grades, levels and dimensions to the requirement of clause 301 and 309. Excavated material to be used in embankment within a lead of 50 metres (average lead 25 metres).					
		<b>Unit = metre</b>					
		<b>Taking output = 10 metres</b>					
	<b>A</b>	<b>Mechanical means</b>					
		<b>a) Labour</b>					
		Mate	day	0.010	272.00	2.72	L-12
		Mazdoor for dressing of bed and side of drain	day	0.250	257.00	64.25	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 0.3 cum bucket capacity @ 30 metres per hour	hour	0.330	1958.00	646.14	P&M-026
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				42.79	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				75.59	
		Cost for 10 metres = a+b+c+d				831.49	

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Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
			Rate per metre = (a+b+c+d)/10				83.15	
						say	<u>83.10</u>	
3.24		B	Manual Means					
			a) Labour					
			Mate	day	0.080	272.00	21.76	L-12
			Mazdoor	day	2.000	257.00	514.00	L-13
			b) Overhead charges @ 0.06 on (a)				32.15	
			c) Contractor's profit @ 0.1 on (a+b)				56.79	
			Cost for 10 metres = a+b+c				624.70	
			Rate per metre = (a+b+c)/10				62.47	
						say	<u>62.50</u>	
		Note	Where lining of drain is provided, quantity shall be worked out based on approved design and drawing and priced on rate of cement concrete of approved grade or stone/brick masonry as the case may be.					
3.25	309		Surface Drains in Ordinary Rock					
			Construction of unlined surface drain of average cross sectional area 0.4 sqm in ordinary rock to specified lines, grades, levels and dimensions as per approved design and to the requirement of clause 301 to 309. Excavated material to be used in embankment at site.					
			Unit = metre					
			Taking output = 10 metres					
		A	Mechanical Means					
			a) Labour					
			Mate	day	0.020	272.00	5.44	L-12
			Mazdoor for dressing of bed and side of drain	day	0.500	257.00	128.50	L-13
			b) Machinery					
			Hydraulic Excavator 0.3 cum bucket capacity @ 15 metres per hour	hour	0.670	1958.00	1311.86	P&M-026
			c) Overhead charges @ 0.06 on (a+b)				86.75	
			d) Contractor's profit @ 0.1 on (a+b+c)				153.25	
			Cost for 10 metres = a+b+c+d				1685.80	
			Rate per metre = (a+b+c+d)/10				168.58	
						say	<u>169.00</u>	
3.25		B	Manual Means					
			a) Labour					
			Mate	day	0.120	272.00	32.64	L-12
			Mazdoor	day	3.000	257.00	771.00	L-13
			b) Overhead charges @ 0.06 on (a)				48.22	
			c) Contractor's profit @ 0.1 on (a+b)				85.19	
			Cost for 10 metres = a+b+c				937.04	
			Rate per metre = (a+b+c)/10				93.70	
						say	<u>93.70</u>	
3.26	309		Surface Drains in Hard Rock					
			Rate per metre may be worked out based on quantity of hard rock as per design.					
			For rate of hard rock cutting, refer relevant item in this chapter.					
3.27	309		Sub-Surface Drains with Perforated Pipe					
			Construction of subsurface drain with perforated pipe of 100 mm internal diameter of metal/ asbestos cement/ cement concrete/PVC, closely jointed, perforations ranging from 3 mm to 6 mm depending upon size of material surrounding the pipe, with 150 mm bedding below the pipe and 300 mm cushion above the pipe, cross section of excavation 450 x 550 mm. Excavated material to be utilised in roadway at site.					

Analysis of Rates  
**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		<b>Unit = metre</b>					
		<b>Taking output = 10 metres</b>					
		a) Labour					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor for excavation and back filling	day	2.000	257.00	514.00	L-13
		c) Material					
		Perforated pipe of cement concrete, internal dia 100 mm	metre	10.000	106.55	1065.50	M-135
		Crushed stone as per table 300-3	cum	2.400	408.83	981.19	M-012
		d) Overhead charges @ 0.06 on (a+b+c)				154.29	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				272.59	
		Cost for 10 metres = a+b+c+d+e				2998.45	
		Rate per metre = (a+b+c+d+e)/10				299.85	
					say	<u>300.00</u>	
		Note Type of pipe may be modified depending upon provision in design.					
3.28	309	<b>Aggregate Sub-Surface Drains</b>					
		Construction of aggregate sub surface drain 300 mm x 450 mm with aggregates conforming to table 300-4, excavated material to be utilised in roadway.					
		<b>Unit = metre</b>					
		<b>Taking output = 10 metres</b>					
		a) Labour					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoor for excavation and back filling with aggregates	day	1.500	257.00	385.50	L-13
		b) Material					
		Crushed stone as per table 300-3	cum	1.350	408.83	551.92	M-012
		c) Overhead charges @ 0.06 on (a+b)				56.57	
		d) Contractor's profit @ 0.1 on (a+b+c)				99.94	
		Cost for 10 metres = a+b+c+d				1099.38	
		Rate per metre = (a+b+c+d)/10				109.94	
					say	<u>110.00</u>	
3.29	309	<b>Underground Drain at Edge of Pavement</b>					
		Construction of an underground drain 1 m x 1 m (inside dimensions) lined with RCC-20 cm thick and covered with RCC slab 10 cm in thickness on urban roads.					
		<b>Unit = Running metre</b>					
		<b>Taking output = one metre</b>					
		a) Earthwork in soil	cum	1.500	54.00	81.00	Item No. 3.13 B
		b) RCC work M-20	cum	0.495	4075.00	2017.13	Item 12.8 (C) II RCC
		Rate per metre = (a+b)				2098.13	
		Rates for these items may be taken from chapters on earth work and substructures respectively.			say	<u>2098.00</u>	
3.30	310	<b>Preparation and Surface Treatment of Formation.</b>					
		Preparation and surface treatment of formation by removing mud and slurry, watering to the extent needed to maintain the desired moisture content, trimming to the required line, grade, profile and rolling with 8-10 tonne smooth wheeled roller, complete as per clause 310.					
		<b>Unit = sqm</b>					
		<b>Taking output = 3500sqm</b>					
		a) Labour					
		Mate	day	0.280	272.00	76.16	L-12
		Mazdoor	day	6.000	257.00	1542.00	L-13
		Mazdoor skilled	day	1.000	325.00	325.00	L-15

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Analysis of Rates  
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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Smooth 3 wheeled steel roller 8-10 tonnes	hour	3.000	781.00	2343.00	P&M-044
		Water tanker 6 KL, one trip per hour	hour	3.000	183.00	549.00	P&M-060
		<b>c) Material</b>					
		Cost of water	KL	18.000	253.69	4566.42	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				564.09	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				996.57	
		Cost for 3500 sqm = a+b+c+d+e				10962.24	
		<b>Rate per sqm = (a+b+c+d+e)/3500</b>				3.13	
					<b>say</b>	<b>3.10</b>	
<b>3.31</b>	<b>313</b>	<b>Construction of Rock fill Embankment</b>					
		Construction of rock fill embankment with broken hard rock fragments of size not exceeding 300 mm laid in layers not exceeding 500 mm thick including filling of surface voids with stone spalls, blinding top layer with granular material, rolled with vibratory road roller, all complete as per clause 313.					
		<b>Unit = cum</b>					
		<b>Taking output = 100 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor	day	1.500	257.00	385.50	L-13
		<b>b) Machinery</b>					
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	5598.00	2799.00	P&M-014
		Vibratory road roller 8-10 tonnes @ 100 cum per hour	hour	1.000	2029.00	2029.00	P&M-059
		Water tanker 6 KL, one trip per hour	hour	2.000	183.00	366.00	P&M-060
		<b>c) Material</b>					
		Cost of water	KL	12.000	253.69	3044.28	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				518.08	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				915.27	
		Cost for 100 cum = a+b+c+d+e				10068.01	
		<b>Rate per cum = (a+b+c+d+e)/100</b>				100.68	
					<b>say</b>	<b>100.70</b>	
		<b>Note</b> It is assumed that rock is available locally at site from roadway cutting. In case, portion of the rock requires breaking to acceptable size of 300 mm, breaking charges will have to be added.					
		<b>EARTH WORK ON HILL ROAD</b>					
<b>3.32</b>	<b>301</b>	<b>Excavation in Hill Area in Soil by Mechanical Means</b>					
		Excavation in soil in hilly area by mechanical means including cutting and trimming of side slopes and disposing of excavated earth with all lifts and lead upto 1000 metres.					
		<b>Unit = cum</b>					
		<b>Taking output = 260 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	272.00	65.28	L-12
		Mazdoor for trimming slopes and helping in excavation etc.	day	6.000	257.00	1542.00	L-13
		<b>b) Machinery</b>					
		Dozer 80 HP (D-80 A 12) @ 43.28 cum per hour	hour	6.000	5598.00	33588.00	P&M-014
		Front end loader	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 5.5cum capacity, 4 trips per hour.	hour	12.000	1018.00	12216.00	P&M-048
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				3338.96	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				5898.82	
		Cost for 260 cum = a+b+c+d				64887.06	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost (₹)	Remarks/ Input ref.
		Rate per cum = (a+b+c+d)/260				249.57	
					say	<u>250.00</u>	
		<b>Note</b> In case the land on the valley side is barren and there is no objection for disposing of excavated earth on the valley side, the provision of front end loader and tipper shall be deleted as excavated earth shall be disposed off on the valley side.					
3.33	301	<b>Excavation in Hilly Area in Ordinary Rock by Mechanical Means not Requiring Blasting.</b>					
		Excavation in hilly area in ordinary rock not requiring blasting by mechanical means including cutting and trimming of slopes and disposal of cut material with all lift and lead upto 1000 metres.					
		<b>Unit = cum</b>					
		<b>Taking output = 170 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.320	272.00	87.04	L-12
		Mazdoor	day	8.000	257.00	2056.00	L-13
		<b>b) Machinery</b>					
		Dozer 80 HP (D-80 A 12) @ 28.32 cum per hour	hour	6.000	5598.00	33588.00	P&M-014
		Front end loader	hour	7.000	1373.00	9611.00	P&M-017
		Tipper 5.5cum capacity, 4 trips per hour.	hour	7.000	1018.00	7126.00	P&M-048
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				3148.08	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				5561.61	
		Cost for 170 cum = a+b+c+d				61177.73	
		Rate per cum = (a+b+c+d)/170				359.87	
					say	<u>360.00</u>	
		<b>Note</b> In case the land on the valley side is barren and there is no objection for disposing of excavated earth on the valley side, the provision of front end loader and tipper shall be deleted as excavated earth can be disposed off on the valley side.					
3.34	301	<b>Excavation in Hilly Areas in Hard Rock Requiring Blasting</b>					
		Excavation in hilly areas in hard rock requiring blasting, by mechanical means including trimming of slopes and disposal of cut material with all lifts and lead upto 1000 metres.					
		<b>Unit = cum</b>					
		<b>Taking output = 170 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.490	272.00	133.28	L-12
		Mazdoor	day	10.000	257.00	2570.00	L-13
		Driller	day	2.000	307.00	614.00	L-06
		Blaster	day	0.250	425.00	106.25	L-03
		<b>b) Machinery</b>					
		Dozer 80 HP (D-80 A 12) @ 28.32 cum per hour	hour	6.000	5598.00	33588.00	P&M-014
		Air compressor 250 cfm with two jack hammer @ 20 cum per hour	hour	5.000	481.00	2405.00	P&M-001
		Front end loader	hour	7.000	1373.00	9611.00	P&M-017
		Tipper 5.5cum capacity, 4 trips per hour.	hour	7.000	1018.00	7126.00	P&M-048
		<b>c) Materials</b>					
		Gelatine 80 per cent	kg	35.000	781.83	27364.05	M-104
		Electric Detonators @ 1 Detonator for 2 Gelatine sticks of 125 gms each	each	140.000	5.73	802.00	M-094 /100
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				5059.18	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				8937.88	
		Cost for 170 cum = a+b+c+d+e				98316.63	
		Rate per cum = (a+b+c+d+e)/170				578.33	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost( ₹)	Remarks/ Input ref.
					say	<u>578.00</u>	
		<b>Note</b> In case the land on the valley side is barren and there is no objection for disposing of excavated earth on the valley side, the provision of front end loader and tipper shall be deleted as excavated earth can be disposed off on the valley side.					
		In case of hill roads, the altitude effect comes into play. The output of men and machines decreases progressively after 2100 m elevation leading to increase in cost . High altitude effect has been explained in the basic approach.					
3.35		<b>Work in Urban Roads</b>					
		The cost of earth work in urban roads inhabited area will be comparatively higher due to following reasons:					
		a) There is mixed traffic on urban roads like slow moving hand and animal driven carts, rickshaws, cycles, two/ three wheeler apart from the usual vehicular traffic resulting into traffic jams. This causes loss of working time which may be in the range of 10 -15 per cent.					
		b) There is considerable disruption of traffic adversely affecting the efficiency of the working parties including machines due to congestion caused by pedestrian traffic, local road side vendors, parking of vehicles by the road side, encroachments by the shopkeepers and local shops who make use of the berms of the road in front of these shops and unauthorised conversion of road berms into mini local market The output of manpower and machines is substantially reduced due to factors mentioned above.					
		c) Cost of living in urban areas is comparatively more resulting into higher wages.					
		d) At times, work is executed during night time due to heavy traffic during day time. This involves extra expenditure by way of making arrangement for lighting and special transport for working parties due to odd hour.					
		In the light of above, the authorities engaged in preparing the cost estimates may exercise their judgment and cater for the additional cost to the extent of 2 to 3 per cent, keeping in view the severity of factors mentioned above. Supporting details for the extra cost based on the actual conditions in specific cases will have to give in justification.					
3.36	Suggestive	<b>Embankment Construction with Flyash/Pond ash available from coal or lignite burning Thermal Plants as waste material.</b>					
		Construction of embankment with Flyash conforming to table 1 of IRC: SP: 58 - 2001 obtained from coal or lignite burning thermal power stations as waste material, spread and compacted in layer of 200mm thickness each at OMC, all as specified in IRC: SP: 58-2001 and as per approved plans.					
		<b>Unit = cum</b>					
		<b>Taking output = 360 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.160	272.00	43.52	L-12
		Mazdoor	day	4.000	257.00	1028.00	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 0.9 cum bucket capacity @ 60 cum/hour	hour	6.000	1958.00	11748.00	P&M-026
		Tipper 10T capacity fly ash 360 x 1.2 = 432 tonnes	tonne.km	432 x L	8.86	3827.52	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage for loading and unloading</b>				<b>382.75</b>	
		Dozer 80 HP for spreading @ 200 cum/hour	hour	1.800	5598.00	10076.40	P&M-014
		Motor Grader for grading @ 100 cum/hour	hour	3.600	2697.00	9709.20	P&M-032

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**EARTH WORK, EROSION CONTROL AND DRAINAGE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate( ₹)	Cost( ₹)	Remarks/ Input ref.
					say	<u>578.00</u>	
		Water tanker 6 KL capacity	hour	12.000	183.00	2196.00	P&M-060
		Vibratory Roller 8-10 tonne @ 100 cum/hour	hour	3.600	2029.00	7304.40	P&M-059
		c) Overhead charges @ 0.06 on (a+b)				2778.95	
		d) Contractor's profit @ 0.1 on (a+b+c)				4909.47	
		Cost for 360 cum = a+b+c+d				54004.21	
		Rate per cum = (a+b+c+d)/360				150.01	
					say	<u>150.00</u>	
		<b>Note</b> 1.As flyash is available free of cost as waste material from Thermal Plants, cost of material has not been added.					
		2.The earth cover on sides and intermediate layers of earth sandwiching the flyash have not been included in this analysis. The same are required to be provided as per approved design and priced separately as embankment construction.					

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## **CHAPTER-4**

# **SUB-BASES, BASES (NON-BITUMINOUS) AND SHOULDERS**

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## Chapter – 4

### Sub-Bases, Bases (Non-Bituminous) and Shoulders

#### Preamble:

1. Quantities of materials provided are approximate and are meant for the purpose of estimating only. Actual quantities shall be as per mix design.
2. For construction of sub-base, two alternatives as under have been provided:
  - a. Mix in place method
  - b. Plant mix method
3. Although plant mix method has not been provided in the MoRT&H Specifications, it is actually being adopted by some of the contractors who are holding the mixing plants to get better quality of mix. It is also found economical as it can achieve much more progress. It is recommended that this point may be kept in view during future revision of specifications of sub-base.
4. In the case of improvement of sub-grade with lime stabilization, soil is assumed to be available and has not been provided for. Only lime has been catered. In the case of lime stabilization of sub-base, soil has been provided to form the sub-base.
5. In the case of medians, separators and footpaths, plate compactor has been catered for compaction due to restricted space.
6. It has been assumed in the case of crushed cement concrete sub-base/base that during the process of dismantling, 25 per cent of aggregates will get segregated and only the remaining will have to be broken / crushed from dismantled concrete slab portions. Transportation of materials has been catered from place of dismantling to work site. In case, site is the same, transportation cost can be deleted.
7. Separate rate for penetration coat over top layer of crushed cement concrete base has been provided, as this item is optional.
8. While providing for the rate of materials, detailed local enquires should be made and prevailing market rates ascertained from concerned suppliers in the area keeping in view the location of crushing plants and lead involved.
9. The rate analyses for crushing of aggregates have also been included in Chapter-1. The cost of procured aggregated and crushed aggregates by own crusher should be compared and economic alternative adopted. It has generally been observed in practice that contractors are setting up their own crushing plants where quantities of aggregates are large especially for projects above ₹50 crores.
10. The quantity considered in the output is the compacted quantity. The quantities of aggregates provided in the rate analysis under the head material are the uncompacted quantities.

*Chh.*  
12/8/19



Summary of Rate Analysis

CHAPTER - 4

**SUB-BASES, BASES ( NON-BITUMINOUS) AND SHOULDERS**

Item No.	Description	Unit	Rate (₹)
<b>4.1</b>	<b>Granular Sub-base with Close Graded Material (Table:- 400-1)</b>		
<b>A</b>	<b>Plant Mix Method</b> (Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401. )		
(i)	<b>for grading- I Material</b>	cum	1027.00
(ii)	<b>for grading- II Material</b>	cum	990.00
(iii)	<b>for grading-III Material</b>	cum	899.00
<b>B</b>	<b>By Mix in Place Method</b> (Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401.)		
(i)	<b>for grading- I Material</b>	cum	761.00
(ii)	<b>for grading- II Material</b>	cum	725.00
(iii)	<b>for grading-III Material</b>	cum	633.00
<b>4.2</b>	<b>Granular Sub-Base with Coarse Graded Material ( Table:- 400- 2)</b> (Construction of granular sub-base by providing coarse graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401.)		
(i)	<b>for grading- I Material</b>	cum	772.00
(ii)	<b>for grading- II Material</b>	cum	770.00
(iii)	<b>for grading-III Material</b>	cum	758.00
<b>4.3</b>	<b>Lime Stabilisation for Improving Subgrade</b> (Laying and spreading available soil in the subgrade on a prepared surface, pulverising, mixing the spread soil in place with rotavator with 3 % slaked lime having minimum content of 70% of CaO, grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade.)		
<b>A</b>	<b>By Mechanical Means</b>	cum	426.00
<b>B</b>	<b>By Manual Means</b>	cum	416.00
<b>4.4</b>	<b>Lime Treated Soil for Sub- Base</b> (Providing, laying and spreading soil on a prepared sub grade, pulverising, mixing the spread soil in place with rotavator with 3 % slaked lime with minimum content of 70% of CaO, grading with motor grader and compacting with the road roller at OMC to achieve at least 98% of the max dry density to form a layer of sub base.)	cum	513.00
<b>4.5</b>	<b>Cement Treated Soil Sub Base/ Base</b> (Providing, laying and spreading soil on a prepared sub grade, pulverising, adding the designed quantity of cement to the spread soil, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.)	cum	716.00
<b>4.6</b>	<b>Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4 in Sub base/ Base</b> (Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.)		
(i)	For Sub-Base course	cum	1330.00
(ii)	For Base course	cum	1148.00
<b>4.7</b>	<b>Making 50 mm x 50 mm Furrows</b> (Making 50 mm x 50 mm furrows, 25mm deep, 450 to the center line of the road and at one metre interval in the existing thin bituminous wearing coarse including sweeping and disposal of excavated material within 1000 metres lead.)		
	<b>i) 25 mm deep furrow cutting</b>	sqm	3.60
	<b>ii) 50 mm deep furrow cutting</b>	sqm	7.20
<b>4.8</b>	<b>Inverted Choke</b> (Construction of inverted choke by providing, laying, spreading and compacting screening B type/ coarse sand of specified grade in uniform layer on a prepared surface with motor grader and compacting with power roller etc.)	cum	338.00
	For Koilwar sand	cum	338.00

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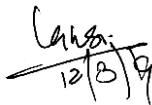
### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
<b>4.9</b>	<b>Water Bound Macadam</b> (Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes / Smooth 3 wheeled Steel Roller in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.)		
<b>A</b>	<b>By Manual Means</b>		
(i)	<b>Grading- I (Using Screening Crushable type such as Moorum or Gravel)</b>		
(a)	<b>Using Screening Crushable type such as Moorum or Gravel (with Vibratory Roller)</b>	cum	996.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	987.00
(b)	<b>Using Screening Type-A (13.2mm Agg.) (with Vibratory Roller)</b>	cum	1110.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	1101.00
(ii)	<b>Grading- II (Using Screening Crushable type such as Moorum or Gravel)</b>		
(a)	<b>Using Screening Crushable type such as Moorum or Gravel (with Vibratory Roller)</b>	cum	1039.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	1030.00
(b)	<b>Using Screening Type-A (13.2mm Agg.) (with Vibratory Roller)</b>	cum	1094.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	1085.00
(c)	<b>Using Screening Type-B (11.2mm Agg.) (with Vibratory Roller)</b>	cum	1114.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	1094.00
(iii)	<b>Grading- III (Using Screening Crushable type such as Moorum or Gravel)</b>		
(a)	<b>Using Screening Crushable type such as Moorum or Gravel (with Vibratory Roller)</b>	cum	1082.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	1073.00
(b)	<b>Using Screening Type-B (11.2mm Agg.) (with Vibratory Roller)</b>	cum	1146.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	1137.00
<b>B</b>	<b>By Mechanical Means:</b>		
(i)	<b>Grading- I (Using Screening Crushable type such as Moorum or Gravel)</b>		
(a)	<b>Using Screening Crushable type such as Moorum or Gravel (with Vibratory Roller)</b>	cum	855.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	846.00
(b)	<b>Using Screening Type-A (13.2mm Agg.) (with Vibratory Roller)</b>	cum	969.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	960.00
(ii)	<b>Grading- II (Using Screening Crushable type such as Moorum or Gravel)</b>		
(a)	<b>Using Screening Crushable type such as Moorum or Gravel (with Vibratory Roller)</b>	cum	898.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	889.00
(b)	<b>Using Screening Type-A (13.2mm Agg.) (with Vibratory Roller)</b>	cum	953.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	944.00
(c)	<b>Using Screening Type-B (11.2mm Agg.) (with Vibratory Roller)</b>	cum	973.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	953.30
(iii)	<b>Grading- III (Using Screening Crushable type such as Moorum or Gravel)</b>		
(a)	<b>Using Screening Crushable type such as Moorum or Gravel (with Vibratory Roller)</b>	cum	941.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	932.00
(b)	<b>Using Screening Type-B (11.2mm Agg.) (with Vibratory Roller)</b>	cum	1005.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	996.00
<b>4.10</b>	<b>Crushed Cement Concrete Sub-base / Base</b> (Breaking and crushing of material obtained by breaking damaged cement concrete slabs to size range not exceeding 75 mm as specified in table 400.7 transporting the aggregates obtained from breaking of cement concrete slabs at a lead of L km., laying and compacting the same as sub base/ base course, constructed as WBM to clause 404 except the use of screening or binding Material.)		
	<b>With Vibratory Roller</b>	cum	298.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	289.00
<b>4.11</b>	<b>Penetration Coat Over Top Layer of Crushed Cement Concrete Base</b> (Spraying of bitumen over cleaned dry surface of crushed cement concrete base at the rate of 25 kg per 10 sqm by a bitumen pressure distributor, spreading of key aggregates at the rate of 0.13 cum per 10 sqm by a mechanical gritter and rolling the surface as per clause 506.3.8.)	sqm	19.90

*Chandra*  
12/3/19

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
4.12	<b>Wet Mix Macadam</b> (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.)		
	<b>With Vibratory Roller</b>	cum	1005.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	1013.00
4.13	<b>Construction of Median and Island with Soil Taken from Roadway Cutting</b> (Construction of Median and Island above road level with approved material deposited at site from roadway cutting and excavation for drain and foundation of other structures, spread, graded and compacted as per clause 407.)	cum	339.00
4.14	<b>Construction of Median and Island with Soil Taken from Borrow Areas</b> (Construction of median and Island above road level with approved material brought from borrow pits, spread, sloped and compacted as per clause 407.)	cum	393.00
4.15	<b>Construction of Shoulders</b> (A. Earthen Shoulders)		-
	B.) Hard Shoulders		-
	C.) Paved Shoulders		-
4.16	<b>Footpaths and Separators</b> (Construction of footpath/separator by providing a 150 mm compacted granular sub base as per clause 401 and 25 mm thick cement concrete grade M15, over laid with precast concrete tiles in cement mortar 1:3 including provision of all drainage arrangements but excluding kerb channel.)	sqm	775.00
4.17	<b>Crusher Run Macadam Base</b> (Providing crushed stone aggregate, depositing on a prepared surface by hauling vehicles, spreading and mixing with a motor grader, watering and compacting with a vibratory roller to clause 410 to form a layer of sub-base/Base.)		
A	<b>By Mix in Place Method</b>		
(i)	For 53 mm maximum size	cum	743.00
(ii)	For 45 mm maximum size	cum	740.00
B	<b>By Mixing Plant :</b>		
(i)	For 53 mm maximum size	cum	979.00
(ii)	For 45 mm maximum size	cum	1000.00
4.18	<b>Lime, Fly ash stabilised soil sub-base</b> (Construction of Sub-base using lime - fly ash admixture with granular soil, free from organic matter/ deleterious material or clayey silts and low plasticity clays having PI between 5 and 20 and liquid limit less than 25 and commercial dry lime, slaked at site or pre-slaked with CaO content not less than 50%, fly ash to conform to gradation as per clause 4.3 of IRC: 88-1984, lime + fly ash content ranging between 10 to 30%, the minimum un-confined compressive strength and CBR value after 28 days curing and 4 days soaking to be 7.5 kg/sq, cm and 25% respectively, all as specified in IRC: 88-1984.)	cum	433.00

  
 12/3/19



Analysis of Rates  
CHAPTER - 4  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
4.1	401		<b>Granular Sub-Base with Close Graded Material (Table:- 400-1)</b>					
		<b>A</b>	<b>Plant Mix Method</b>					
			Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401.					
			<b>Unit = cum</b>					
			<b>Taking output = 225 cum (450 tonne)</b>					
			<b>a) Labour</b>					
			Mate	day	0.400	272.00	108.80	L-12
			Mazdoor skilled	day	2.000	325.00	650.00	L-15
			Mazdoor	day	8.000	257.00	2056.00	L-13
			<b>b) Machinery</b>					
			Wet mix plant @ 75 tonne capacity per hour	hour	6.000	2791.00	16746.00	P&M-094
			Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
			Water tanker 6 KL capacity 5 km lead with one tripper hour	hour	4.500	183.00	823.50	P&M-060
			Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
			Tipper 10 tonne	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
			<b>Add 10 per cent of cost of carriage to cover loading and unloading</b>				<b>398.70</b>	
			Motor Grader 110 HP	hour	6.000	2697.00	16182.00	P&M-032
			Vibratory roller 8-10 t	hour	6.000	2029.00	12174.00	P&M-059
			<b>c) Material</b>					
			Close graded Granular sub-base Material as per table 400-1					
			<b>For Grading-I Material</b>					
			53 mm to 9.5 mm @ 50 per cent	cum	144.000	516.42	74364.48	M-013
			9.5 mm to 2.36 mm @ 20 per cent	cum	57.000	411.33	23445.81	M-017
			2.36 mm below @ 30 per cent	cum	86.400	188.40	16277.76	M-020
			Cost of water	KL	27.000	253.69	6849.63	M-189
			<b>OR</b>					
			<b>For Grading-II Material</b>					
			26.5 mm to 9.5 mm @ 35 per cent	cum	100.800	553.32	55774.66	M-015
			9.5 mm to 2.36 mm @ 25 per cent	cum	72.000	411.33	29615.76	M-017
			2.36 mm below @ 40 per cent	cum	115.200	188.40	21703.68	M-020
			Cost of water	KL	27.000	253.69	6849.63	M-189
			<b>OR</b>					
			<b>For Grading-III Material</b>					
			9.5 mm to 4.75 mm @ 35 per cent	cum	100.800	531.40	53565.12	M-016
			4.75 mm to 2.36 mm @ 12.5 per cent	cum	36.000	202.91	7304.76	M-018
			2.36 mm below @ 52.5 per cent	cum	151.200	188.40	28486.08	M-020
			Cost of water	KL	27.000	253.69	6849.63	M-189
4.1A		(i)	<b>Rate per cum for grading-I Material</b>					
			d) Overhead charges @ 0.06 on (a+b+c)				11887.42	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				21001.11	
			Cost for 225 cum = a+b+c+d+e				231012.21	
			<b>Rate per cum = (a+b+c+d+e)/225</b>				1026.72	
						<b>say</b>	<b>1027.00</b>	
4.1A		(ii)	<b>Rate per cum for grading-II Material</b>					
			d) Overhead charges @ 0.06 on (a+b+c)				11467.78	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				20259.75	
			Cost for 225 cum = a+b+c+d+e				222857.26	
			<b>Rate per cum = (a+b+c+d+e)/225</b>				990.48	
						<b>say</b>	<b>990.00</b>	
4.1A		(iii)	<b>Rate per cum for grading-III Material</b>					
			d) Overhead charges @ 0.06 on (a+b+c)				10403.50	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				18379.51	
			Cost for 225 cum = a+b+c+d+e				202174.59	
			<b>Rate per cum = (a+b+c+d+e)/225</b>				898.55	
						<b>say</b>	<b>899.00</b>	
		<b>Note</b>	Any one of the grading for material may be adopted as per design.					

Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
4.1		B	<b>By Mix in Place Method</b>					
			Construction of granular sub-base by providing close graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401.					
			<b>Unit = cum</b>					
			<b>Taking output = 300 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.480	272.00	130.56	L-12
			Mazdoor skilled	day	2.000	325.00	650.00	L-15
			Mazdoor unskilled	day	10.000	257.00	2570.00	L-13
			<b>b) Machinery</b>					
			Motor Grader 110 HP @ 50 cum	hour	6.000	2697.00	16182.00	P&M-032
			Vibratory roller 8 -10 tonne	hour	6.000	2029.00	12174.00	P&M-059
			Tractor - Rotavator	hour	12.000	570.00	6840.00	P&M-054
			Water tanker 6 KL capacity	hour	3.000	183.00	549.00	P&M-060
			<b>c) Material</b>					
			Close graded Granular sub-base Material as per table 400-1					
			<b>For Grading-I Material</b>					
			53 mm to 9.5 mm @ 50 per cent	cum	192.000	516.42	99152.64	M-013
			9.5 mm to 2.36 mm @ 20 per cent	cum	76.000	411.33	31261.08	M-017
			2.36 mm below @ 30 per cent	cum	115.200	188.40	21703.68	M-020
			Cost of water	KL	18.000	253.69	4566.42	M-189
			<b>OR</b>					
			<b>For Grading-II Material</b>					
			26.5 mm to 9.5 mm @ 35 per cent	cum	134.400	553.32	74366.21	M-015
			9.5 mm to 2.36 mm @ 25 per cent	cum	96.000	411.33	39487.68	M-017
			2.36 mm below @ 40 per cent	cum	153.600	188.40	28938.24	M-020
			Cost of water	KL	18.000	253.69	4566.42	M-189
			<b>OR</b>					
			<b>For Grading-III Material</b>					
			9.5 mm to 4.75 mm @ 35 per cent	cum	134.400	531.40	71420.16	M-016
			4.75 mm to 2.36 mm @ 12.5 per cent	cum	48.000	202.91	9739.68	M-018
			2.36 mm below @ 52.5 per cent	cum	201.600	188.40	37981.44	M-020
			Cost of water	KL	18.000	253.69	4566.42	M-189
4.1B		(i)	<b>Rate per cum for grading-I Material</b>					
			d) Overhead charges @ 0.06 on (a+b+c)				11746.76	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				20752.61	
			Cost for 300 cum = a+b+c+d+e				228278.76	
			Rate per cum = (a+b+c+d+e)/300				760.93	
						say	<u>761.00</u>	
4.1B		(ii)	<b>Rate per cum for grading-II Material</b>					
			d) Overhead charges @ 0.06 on (a+b+c)				11187.25	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				19764.14	
			Cost for 300 cum = a+b+c+d+e				217405.49	
			Rate per cum = (a+b+c+d+e)/300				724.68	
						say	<u>725.00</u>	
4.1B		(iii)	<b>Rate per cum for grading-III Material</b>					
			d) Overhead charges @ 0.06 on (a+b+c)				9768.20	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				17257.15	
			Cost for 300 cum = a+b+c+d+e				189828.60	
			Rate per cum = (a+b+c+d+e)/300				632.76	
						say	<u>633.00</u>	
		Note	Any one of the grading for material may be adopted as per design.					

L.H.S.  
12/3/19

Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
4.2	401	<b>Granular Sub-Base with Coarse Graded Material (Table:- 400- 2)</b>					
		Construction of granular sub-base by providing coarse graded material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller to achieve the desired density, complete as per clause 401.					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.400	272.00	108.80	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	8.000	257.00	2056.00	L-13
		<b>b) Machinery</b>					
		Mortar Grader 110 HP @ 50 cum per hour	hour	6.000	2697.00	16182.00	P&M-032
		Vibratory roller 8 -10 tonne	hour	6.000	2029.00	12174.00	P&M-059
		Water tanker 6 KL capacity	hour	3.000	183.00	549.00	P&M-060
		<b>c) Material</b>					
		For coarse graded Granular sub-base Materials per table 400-2					
		<b>For grading-I Material</b>					
		53 mm to 26.5 mm @ 35 per cent	cum	134.400	458.22	61584.77	M-029
		26.5 mm to 4.75 mm @ 45 per cent	cum	172.800	499.76	86358.53	M-026
		2.36 mm below @ 20 per cent (Coarse Sand)	cum	76.800	185.94	14280.19	M-022
		Cost of water	KL	18.000	253.69	4566.42	M-189
		<b>OR</b>					
		<b>For Grading-II Material</b>					
		26.5 mm to 4.75 mm @ 75 per cent	cum	288.000	499.76	143930.88	M-026
		2.36 mm below @ 25 per cent	cum	96.000	185.94	17850.24	M-022
		Cost of water	KL	18.000	253.69	4566.42	M-189
		<b>OR</b>					
		<b>For Grading-III Material</b>					
		9.5 mm to 4.75 mm @ 66 per cent	cum	255.000	528.94	134879.70	M-025
		2.36 mm below @ 34 per cent	cum	129.000	185.94	23986.26	M-022
		Cost of water	KL	18.000	253.69	4566.42	M-189
4.2	(i)	<b>Rate per cum for grading-I Material</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				11910.58	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				21042.03	
		Cost for 300 cum = a+b+c+d+e				231462.32	
		Rate per cum = (a+b+c+d+e)/300				771.54	
					<b>say</b>	<b>772.00</b>	
4.2	(ii)	<b>Rate per cum for grading-II Material</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				11884.04	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				20995.14	
		Cost for 300 cum = a+b+c+d+e				230946.52	
		Rate per cum = (a+b+c+d+e)/300				769.82	
					<b>say</b>	<b>770.00</b>	
4.2	(iii)	<b>Rate per cum for grading-III Material</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				11709.13	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				20686.13	
		Cost for 300 cum = a+b+c+d+e				227547.44	
		Rate per cum = (a+b+c+d+e)/300				758.49	
					<b>say</b>	<b>758.00</b>	
		<b>Note</b>					
		Any one of the grading for material may be adopted as per design.					

Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
4.3	402		<b>Lime Stabilisation for Improving Sub-grade</b>					
			Laying and spreading available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with rotavator with 3 per cent slaked lime having minimum content of 70 per cent of CaO, grading with motor grader and compacting with the road roller at OMC to the desired density to form a layer of improved sub grade.					
			<b>Unit = cum</b>					
			<b>Taking output = 300 cum (525 tonne)</b>					
		<b>A</b>	<b>By Mechanical Means</b>					
			<b>a) Labour</b>					
			Mate	day	0.360	272.00	97.92	L-12
			Skilled mazdoor for alignment and geometrics	day	1.000	325.00	325.00	L-15
			Mazdoor for spraying lime	day	8.000	257.00	2056.00	L-13
			<b>b) Machinery</b>					
			Tractor with ripper and rotavator attachments @ 60 cum per hour for ripping and 25 cum per hour for mixing	hour	12.000	558.00	6696.00	P&M-055
			Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2697.00	16182.00	P&M-032
			Vibratory roller 8 - 10 tonne capacity	hour	<b>6.00x0.65*</b>	2029.00	7913.10	P&M-059
			Water tanker 6 KL capacity	hour	12.000	183.00	2196.00	P&M-060
			<b>c) Material</b>					
			Lime at site	tonne	15.750	3555.38	55997.24	M-188
			Cost of water	KL	72.000	253.69	18265.68	M-189
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				6583.74	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				11631.27	
			Cost for 300 cum = a+b+c+d+e				127943.94	
			<b>Rate per cum = (a+b+c+d+e)/300</b>				426.48	
						<b>say</b>	<b><u>426.00</u></b>	
		<b>Note</b>	* Though vibratory roller is required only for 3 hours as per norms, but the same has to be available at site for 6 hours as other machines for spreading and mixing will take 6 hours. The usage rates of roller have been multiplied with a factor of 0.65.					
4.3		<b>B</b>	<b>By Manual Means</b>					
			<b>Unit = cum</b>					
			<b>Taking output = 150 cum (263 tonnes)</b>					
			<b>a) Labour</b>					
			Mate	day	1.440	272.00	391.68	L-12
			Mazdoor skilled	day	1.000	325.00	325.00	L-15
			Mazdoor	day	35.000	257.00	8995.00	L-13
			<b>b) Machinery</b>					
			Vibratory roller 8 - 10 tonne @ 60 cum per hour	hour	2.500	2029.00	5072.50	P&M-059
			Water tanker 6 KL capacity	hour	6.000	183.00	1098.00	P&M-060
			<b>c) Material</b>					
			Lime at site	tonne	8.000	3555.38	28443.04	M-188
			Cost of water	KL	36.000	253.69	9132.84	M-189
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				3207.48	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				5666.55	
			Cost for 150 cum = a+b+c+d+e				62332.10	
			<b>Rate per cum = (a+b+c+d+e)/150</b>				415.55	
						<b>say</b>	<b><u>416.00</u></b>	
4.4	402		<b>Lime Treated Soil for Sub- Base</b>					
			Providing, laying and spreading soil on a prepared sub grade, pulverising, mixing the spread soil in place with rotavator with 3 per cent slaked lime with minimum content of 70 per cent of CaO, grading with motor grader and compacting with the road roller at OMC to achieve at least 98 per cent of the max dry density to form a layer of sub base.					

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**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum (525 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	272.00	130.56	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	10.000	257.00	2570.00	L-13
		<b>b) Machinery</b>					
		Excavator 0.90 cum bucket capacity	hour	6.000	1958.00	11748.00	P&M-026
		Tipper for carriage of soil	tonne.km	525 x L	8.86	4651.50	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>465.15</b>	
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2697.00	16182.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	2029.00	12174.00	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	570.00	6840.00	P&M-054
		Water tanker 6 KL capacity	hour	12.000	183.00	2196.00	P&M-060
		<b>c) Material</b>					
		Lime at site	tonne	15.750	3555.38	55997.24	M-188
		Cost of water	KL	72.000	253.69	18265.68	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				7912.21	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				13978.23	
		Cost for 300 cum = a+b+c+d+e				153760.57	
		<b>Rate per cum= (a+b+c+d+e)/300</b>				512.54	
					<b>say</b>	<b>513.00</b>	
<b>4.5</b>	<b>403</b>	<b>Cement Treated Soil Sub Base/ Base</b>					
		Providing, laying and spreading soil on a prepared sub grade, pulverising, adding the designed quantity of cement to the spread soil, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum (525 tonnes)</b>					
		<b>For 4 per cent quantity of cement by weight of soil</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	272.00	130.56	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	10.000	257.00	2570.00	L-13
		<b>b) Machinery</b>					
		Excavator 0.90 cum bucket capacity	hour	6.000	1958.00	11748.00	P&M-026
		Tipper for carriage of soil	tonne.km	525 x L	8.86	4651.50	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>465.15</b>	
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2697.00	16182.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	2029.00	12174.00	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	570.00	6840.00	P&M-054
		Water tanker 6 KL capacity	hour	12.000	183.00	2196.00	P&M-060
		<b>c) Material</b>					
		Cement at site (@ 4 per cent of 525 tonne)	tonne	21.000	5156.00	108276.00	M-081
		Cost of water	KL	72.000	253.69	18265.68	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				11048.93	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				19519.78	
		Cost for 300 cum = a+b+c+d+e				214717.61	
		<b>Rate per cum= (a+b+c+d+e)/300</b>				715.73	
					<b>say</b>	<b>716.00</b>	

Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
4.6	403	<b>Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4 in Sub base/ Base</b>					
		Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum (600 tonnes)</b>					
		<b>Quantity of cement assumed as 4 per cent of quantity of crushed rock by weight.</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	272.00	130.56	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	10.000	257.00	2570.00	L-13
		<b>b) Machinery</b>					
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2697.00	16182.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	2029.00	12174.00	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	570.00	6840.00	P&M-054
		Water tanker 6 KL capacity	hour	10.000	183.00	1830.00	P&M-060
		<b>c) Material</b>					
		Cement at site @ 4 per cent by weight of crushed aggregate (600 tonne)	tonne	24.000	5156.00	123744.00	M-081
		<b>Grading of material for sub-base course</b>					
		37.5 mm to 9.5 mm @ 55 per cent	cum	211.200	492.71	104060.35	M-014
		9.5 mm to 4.75 mm @ 20 per cent	cum	76.800	528.94	40622.59	M-025
		4.75 mm to 75 micron @ 25 per cent	cum	96.000	188.40	18086.40	M-019
		Cost of water	KL	60.000	253.69	15221.40	M-189
		<b>or</b>					
		<b>Grading of material for Base course</b>					
		37.5 mm to 9.5 mm @ 32.5 per cent	cum	124.800	490.24	61181.95	M-028
		9.5 mm to 4.75 mm @ 5 per cent	cum	19.200	528.94	10155.65	M-025
		4.75 mm to 75 micron @ 62.5 per cent	cum	240.000	185.94	44625.60	M-023
		Cost of water	KL	60.000	253.69	15221.40	M-189
4.6	(i)	<b>For Sub-Base course</b>					
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				20526.68	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				36263.80	
		Cost for 300 cum = a+b+c+d+e				398901.78	
		<b>Rate per cum = (a+b+c+d+e)/300</b>				1329.67	
					<b>say</b>	<b>1330.00</b>	
4.6	(ii)	<b>For Base course</b>					
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				17718.31	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				31302.35	
		Cost for 300 cum = a+b+c+d+e				344325.82	
		<b>Rate per cum = (a+b+c+d+e)/300</b>				1147.75	
					<b>say</b>	<b>1148.00</b>	
		<b>Note</b>					
		Quantities of aggregates provided under 'c' above are uncompacted quantities.					
4.7	404.3.1	<b>Making 50 mm x 50 mm Furrows</b>					
		Making 50 mm x 50 mm furrows, 25mm/ 50mm deep, 45°C to the center line of the road and at one metre interval in the existing thin bituminous wearing coarse including sweeping and disposal of excavated material within 1000 metres lead,					
		<b>Unit = sqm</b>					
		<b>Taking output = 30 m x 7 m = 210 sqm</b>					
	(i)	<b>25mm deep furrow cutting</b>					
		<b>a) Labour</b>					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.200	546.00	109.20	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				38.70	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				68.37	
		Cost for 210 sqm= a+b+c+d				752.02	
		<b>Rate per sqm =(a+b+c+d)/210</b>				3.58	
					<b>say</b>	<b>3.60</b>	
	(ii)	<b>50mm deep furrow cutting</b>					
		<b>a) Labour</b>					
		Mate	day	0.160	272.00	43.52	L-12
		Mazdoor	day	4.000	257.00	1028.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.400	546.00	218.40	P&M-053
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				77.40	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				136.73	
		Cost for 210 sqm= a+b+c+d				1504.05	
		<b>Rate per sqm =(a+b+c+d)/210</b>				7.16	
					<b>say</b>	<b>7.20</b>	
<b>4.8</b>	<b>404.3.2</b>	<b>Inverted Choke</b>					
		Construction of inverted choke by providing, laying, spreading and compacting screening B type/ coarse sand of specified grade in uniform layer on a prepared surface with motor grader and compacting with power roller etc.					
		<b>Unit = cum</b>					
		<b>Taking output = 600 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.920	272.00	250.24	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	21.000	257.00	5397.00	L-13
		<b>b) Machinery</b>					
		Motor Grader 110 HP	hour	6.000	2697.00	16182.00	P&M-032
		Vibratory roller 8-10 tonnes @ 60 cum per hour	hour	6.000	2029.00	12174.00	P&M-059
		Water tanker 6 KL capacity	hour	18.000	183.00	3294.00	P&M-060
		<b>c) Material</b>					
		Screening type 'B' or coarse sand	cum	720.000	150.80	108576.00	M-004
		Cost of water	KL	108.000	253.69	27398.52	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				10435.31	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				18435.71	
		Cost for 600 cum = a+b+c+d+e				202792.77	
		<b>Rate per cum = ( a+b+c+d+e)/600</b>				337.99	
					<b>say</b>	<b>338.00</b>	
<b>4.9</b>	<b>404</b>	<b>Water Bound Macadam</b>					
		Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with 3 wheeled steel/ vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.					
	<b>A</b>	<b>By Manual Means</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 360 cum</b>					
		<b>a) Labour</b>					
		Mate	day	10.080	272.00	2741.76	L-12

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**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	250.000	257.00	64250.00	L-13
		<b>b) Machinery</b>					
		Vibratory roller 8 - 10 tonne @ 60cum per hour	hour	6.000	2029.00	12174.00	P&M-059
		or				0.00	
		Smooth 3 wheeled steel roller @ 30cum/hour	hour	12.000		0.00	
		Water tanker 6 KL capacity	hour	24.000	183.00	4392.00	P&M-060
		<b>c) Material ( Refer table 400 - 7, 8 &amp; 9 )</b>					
4.9A	(i)	<b>Grading-I</b>					
		<b>Aggregate</b>					
		Grading-I 90 mm to 45 mm@ 1.21cum per 10 sqm for compacted thickness of 100 mm	cum	435.600	396.24	172602.14	M-039
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	470.04	45687.89	M-042
		OR					
		Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	131.28	14178.24	M-007
		<b>Binding material</b>					
		Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9A (i)	(a)	<b>Using Screening Crushable type such as Moorum or Gravel(Without binding material)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				18451.17	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				32597.07	
		Cost for 360 cum = a+b+c+d+e				358567.74	
		Rate per cum = (a+b+c+d+e)/360				996.02	
		<b>With Vibratory Roller</b>			say	<u>996.00</u>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<u>987.00</u>	Sub_Analysis
4.9A (i)	(b)	<b>Using Screening Type-A (13.2mm agg.) with binding material.</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				20568.60	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				36337.86	
		Cost for 360 cum = a+b+c+d+e				399716.48	
		Rate per cum = (a+b+c+d+e)/360				1110.32	
		<b>With Vibratory Roller</b>			say	<u>1110.00</u>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<u>1101.00</u>	Sub_Analysis
4.9A	(ii)	<b>Grading-II</b>					
		<b>Aggregate</b>					
		Grading-II 63 mm to 45 mm /Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	427.69	186301.76	M-038 / M-036
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-II @ 0.12 cum per 10 sqm	cum	57.600	470.04	27074.30	M-042
		OR					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	131.28	13861.86	M-007
		OR					
		Type B 11.2 mm for grading-III @ 0.20 cum per 10 sqm	cum	96.010	345.52	33173.38	M-041
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9A (ii)	(a)	<b>Using Screening Crushable type such as Moorum or Gravel(Without binding material)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				19254.16	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				34015.69	
		Cost for 360 cum = a+b+c+d+e				374172.59	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Rate per cum = (a+b+c+d+e)/360				1039.37	
		<b>With Vibratory Roller</b>			say	<u>1039.00</u>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<u>1030.00</u>	Sub_Analysis
4.9A (ii)	(b)	<b>Using Screening Type-A (13.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				20273.76	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				35816.98	
		Cost for 360 cum = a+b+c+d+e				393986.80	
		Rate per cum = (a+b+c+d+e)/360				1094.41	
		<b>With Vibratory Roller</b>			say	<u>1094.00</u>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<u>1085.00</u>	Sub_Analysis
4.9A (ii)	(c)	<b>Using Screening Type-B (11.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				20639.71	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				36463.48	
		Cost for 360 cum = a+b+c+d+e				401098.31	
		Rate per cum = (a+b+c+d+e)/360				1114.16	
		<b>With Vibratory Roller</b>			say	<u>1114.00</u>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<u>1094.00</u>	Sub_Analysis
4.9A	(iii)	<b>Grading-III</b>					
		<b>Aggregate</b>					
		Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	458.22	199600.63	M-036
		<b>Stone Screening</b>					
		Type B 11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	345.52	29852.93	M-041
		OR					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	131.28	13861.86	M-007
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9A (iii)	(a)	<b>Using Screening Crushable type such as Moorum or Gravel(Without binding material)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				20052.10	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				35425.37	
		Cost for 360 cum = a+b+c+d+e				389679.07	
		Rate per cum = (a+b+c+d+e)/360				1082.44	
		<b>With Vibratory Roller</b>			say	<u>1082.00</u>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<u>1073.00</u>	Sub_Analysis
4.9A (iii)	(b)	<b>Using Screening Type-B (11.2mm agg.)(With binding material)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				21238.41	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				37521.20	
		Cost for 360 cum = a+b+c+d+e				412733.15	
		Rate per cum = (a+b+c+d+e)/360				1146.48	
		<b>With Vibratory Roller</b>			say	<u>1146.00</u>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<u>1137.00</u>	Sub_Analysis
		(Anyone of the aggregate grading, screening and binding material may be used as per design.)					
4.9	B	<b>By Mechanical Means</b>					
		Unit = cum					
		Taking output = 360 cum					
		a) Labour					

Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	0.680	272.00	184.96	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	15.000	257.00	3855.00	L-13
		<b>b) Machinery</b>					
		Motor grader 110 HP @ 50cum/hr. for spreading	hour	7.200	2697.00	19418.40	P&M-032
		Vibratory roller 8-10 tonnes @ 60cum/hr.	hour	6.000	2029.00	12174.00	P&M-059
		or					
		Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000			
		Water tanker 6 KL capacity	hour	24.000	183.00	4392.00	P&M-060
		<b>c) Material ( Refer table 400 - 7, 8 &amp; 9 )</b>					
4.9B	(i)	<b>Grading-I</b>					
		<b>Aggregate</b>					
		Grading-I 90 mm to 45 mm @ 1.21cum per 10 sqm for compacted thickness of 100 mm	cum	435.600	396.24	172602.14	M-039
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	470.04	45687.89	M-042
		OR					
		Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	131.28	14178.24	M-007
		<b>Binding material</b>					
		Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9B (i)	(a)	<b>Using Screening Crushable type such as Moorum or Gravel(Without binding material)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				15839.17	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				27982.53	
		Cost for 360 cum = a+b+c+d+e				307807.80	
		Rate per cum = (a+b+c+d+e)/360				855.02	
		<b>With Vibratory Roller</b>			say	<u>855.00</u>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<u>846.00</u>	Sub_Analysis
4.9B (i)	(b)	<b>Using Screening Type-A (13.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				17956.60	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				31723.32	
		Cost for 360 cum = a+b+c+d+e				348956.53	
		Rate per cum = (a+b+c+d+e)/360				969.32	
		<b>With Vibratory Roller</b>			say	<u>969.00</u>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<u>960.00</u>	Sub_Analysis
4.9B	(ii)	<b>Grading-II</b>					
		<b>Aggregate</b>					
		Grading-II 63 mm to 45 mm /Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	427.69	186301.76	M-038 / M-036
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-II @ 0.12 cum per 10 sqm	cum	57.600	470.04	27074.30	M-042
		OR					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	131.28	13861.86	M-007
		OR					
		Type B 11.2 mm for grading-III @ 0.20 cum per 10 sqm	cum	96.010	345.52	33173.38	M-041
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9B (ii)	(a)	<b>Using Screening Crushable type such as Moorum or Gravel(Without binding material)</b>					

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Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		d) Overhead charges @ 0.06 on (a+b+c)				16642.16	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				29401.15	
		Cost for 360 cum = a+b+c+d+e				323412.65	
		Rate per cum = (a+b+c+d+e)/360				898.37	
		<b>With Vibratory Roller</b>			say	<b>898.00</b>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<b>889.00</b>	Sub_Analysis
4.9B (ii)	(b)	<b>Using Screening Type-A (13.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				17661.76	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				31202.44	
		Cost for 360 cum = a+b+c+d+e				343226.85	
		Rate per cum = (a+b+c+d+e)/360				953.41	
		<b>With Vibratory Roller</b>			say	<b>953.00</b>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<b>944.00</b>	Sub_Analysis
4.9B (ii)	(c)	<b>Using Screening Type-B (11.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				18027.70	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				31848.94	
		Cost for 360 cum = a+b+c+d+e				350338.37	
		Rate per cum = (a+b+c+d+e)/360				973.16	
		<b>With Vibratory Roller</b>			say	<b>973.00</b>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<b>953.30</b>	Sub_Analysis
4.9B	(iii)	<b>Grading-III</b>					
		<b>Aggregate</b>					
		Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	458.22	199600.63	M-036
		<b>Stone Screening</b>					
		Type B 11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	345.52	29852.93	M-041
		OR					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	131.28	13861.86	M-007
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9B (iii)	(a)	<b>Using Screening Crushable type such as Moorum or Gravel(Without binding material)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				17440.09	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				30810.83	
		Cost for 360 cum = a+b+c+d+e				338919.13	
		Rate per cum = (a+b+c+d+e)/360				941.44	
		<b>With Vibratory Roller</b>			say	<b>941.00</b>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<b>932.00</b>	Sub_Analysis
4.9B (iii)	(b)	<b>Using Screening Type-B (11.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				18626.41	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				32906.66	
		Cost for 360 cum = a+b+c+d+e				361973.21	
		Rate per cum = (a+b+c+d+e)/360				1005.48	
		<b>With Vibratory Roller</b>			say	<b>1005.00</b>	
		OR					
		<b>With Smooth 3 wheeled Steel Roller</b>				<b>996.00</b>	Sub_Analysis
	Note	As three wheeled smooth rollers are also very commonly used, the same has been provided as an alternative.					
4.10	405	<b>Crushed Cement Concrete Sub-base / Base</b>					



Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Breaking and crushing of material obtained by breaking damaged cement concrete slabs to size range not exceeding 75 mm as specified in table 400.7 transporting the aggregates obtained from breaking of cement concrete slabs at a lead of L km., laying and compacting the same as sub base/ base course, constructed as WBM to clause 404 except the use of screening or binding Material.					
		<b>Unit = cum</b>					
		<b>Taking output = 360 cum</b>					
		<b>a) Labour</b>					
		Mate	day	4.160	272.00	1131.52	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor for crushing broken cement concrete pavement/slabs into aggregate	day	102.000	257.00	26214.00	L-13
		<b>b) Machinery</b>					
		Motor Grader, 110 HP @ 50 cum/hr.	hour	6.000	2697.00	16182.00	P&M-032
		Vibratory roller 8 - 10 tonne @ 60 cum per hour	hour	6.000	2029.00	12174.00	P&M-059
		<b>or</b>					
		Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000	781.00		P&M-044
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	720 x L	8.86	6379.20	Lead = 1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>637.92</b>	
		Water tanker 6 KL capacity with 5 km lead @ 1 trip per hour	hour	12.000	183.00	2196.00	P&M-060
		<b>c) Material</b>					
		Material available from dismantled concrete slab after crushing / breaking and only carriage is required to be provided.					
		Cost of water	KL	72.000	253.69	18265.68	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				5524.10	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				9759.24	
		Cost for 360 cum = a+b+c+d+e				107351.66	
		<b>Rate per cum = (a+b+c+d+e)/360</b>				298.20	
					<b>say</b>	<b>298.00</b>	
		<b>With Vibratory Roller</b>				<b>298.00</b>	
		<b>With Smooth 3 wheeled Steel Roller</b>				<b>289.00</b>	Sub_Analysis
		<b>Note</b>					
		1. It is assumed that dismantling of concrete slab/pavement has been considered separately. Hence same is not added in this analysis. Only labour for crushing the dismantled slab into aggregate has been added. Carriage from stock pile to work site has been provided with a lead of L km.					
		2. In case of breaking of slabs is done locally without involvement of transportation, the provision of tipper, front end loader and loading/unloading charges may be deleted.					
		3. As three wheeled smooth steel rollers are commonly in use, the same has been provided as an alternative.					
4.11	405.2	<b>Penetration Coat Over Top Layer of Crushed Cement Concrete Base</b>					
		Spraying of bitumen over cleaned dry surface of crushed cement concrete base at the rate of 25 kg per 10 sqm by a bitumen pressure distributor, spreading of key aggregates at the rate of 0.13 cum per 10 sqm by a mechanical gritter and rolling the surface as per clause 506.3.8.					
		<b>Unit = sqm</b>					
		<b>Taking output = 7500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.560	272.00	152.32	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	12.000	257.00	3084.00	L-13

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Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Mechanical broom hydraulic @ 1250 sqm per hour	hour	6.000	555.00	3330.00	P&M-031
		Hydraulic self propelled chips spreader	hour	6.000	3964.00	23784.00	P&M-025
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	hour	6.000	1018.00	6108.00	P&M-048
		Vibratory roller 8 -10 tonnes @ 30 cum per hour	hour	<b>6.00x0.65*</b>	2029.00	7913.10	P&M-059
		Bitumen pressure distributor @ 1750 sqm per hour	hour	4.280	1613.00	6903.64	P&M-004
		<b>c) Material</b>					
		Crushed stone aggregate 11.2 mm size	cum	97.500	614.17	59881.58	M-051
		Bitumen (60-70 grade)	tonne	0.250	32830.00	8207.50	M-074
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				7695.13	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				13594.73	
		Cost for 7500 sqm = a+b+c+d+e				149541.99	
		<b>Rate per sqm = (a+b+c+d+e)/7500</b>				19.94	
					<b>say</b>	<b>19.90</b>	
		<b>Note</b>					Though vibratory roller is required only for 3 hours as per norms, the same is required to be available at site for 6 hours to match with other machines. The usage rates of vibratory roller may be multiplied with a factor of 0.65.
<b>4.12</b>	<b>406</b>	<b>Wet Mix Macadam</b>					
		Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.					
		<b>Unit = cum</b>					
		<b>Taking output = 225 cum (495 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	272.00	130.56	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	10.000	257.00	2570.00	L-13
		<b>b) Machinery</b>					
		Wet mix plant of 75 tonne hourly capacity	hour	6.600	2791.00	18420.60	P&M-094
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1373.00	8238.00	P&M-017
		Paver finisher	hour	6.000	1390.00	8340.00	P&M-035
		Vibratory roller 8 - 10 tonne	hour	<b>6x0.65*</b>	2029.00	7913.10	P&M-059
		<b>or</b>					
		Smooth 3 wheeled steel roller @ 8-10 tonnes.	hour	12.000	781.00		P&M-044
		Water tanker 6 KL capacity	hour	3.000	183.00	549.00	P&M-060
		Tipper	tonne.km	495 x L	8.86	4385.70	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>438.57</b>	
		<b>c) Material ( Table 400-11)</b>					
		45 mm to 22.4 mm @ 30 per cent	cum	89.100	479.11	42688.70	M-034
		22.4 mm to 2.36 mm @ 40 per cent	cum	118.800	528.14	62743.03	M-031
		2.36 mm to 75 micron @ 30 per cent	cum	89.100	185.94	16567.25	M-022
		Cost of water	KL	18.000	253.69	4566.42	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				11641.38	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				20566.43	
		Cost for 225 cum = a+b+c+d+e				226230.74	
		<b>Rate per cum = (a+b+c+d+e)/225</b>				1005.47	
		<b>With Vibratory Roller</b>			<b>say</b>	<b>1005.00</b>	
		<b>With Smooth 3 wheeled Steel Roller</b>				<b>1013.00</b>	Sub_Analysis

Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Note</b>	1. Though vibratory roller is required only for 3 hours as per norms, the same is required to be available at site for 6 hours to match with other machines. The usage rates of vibratory roller may be multiplied with a factor of 0.65					
			2. As three wheeled smooth steel rollers are commonly in use, the same has been provided as an alternative which can be used if the thickness of individual layer does not exceed 100 mm.					
4.13	407		<b>Construction of Median and Island with Soil Taken from Roadway Cutting</b>					
			Construction of Median and Island above road level with approved material deposited at site from roadway cutting and excavation for drain and foundation of other structures, spread, graded and compacted as per clause 407.					
			<b>Unit = cum</b>					
			<b>Taking output = 21 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.240	272.00	65.28	L-12
			Mazdoor	day	6.000	257.00	1542.00	L-13
			<b>b) Machinery</b>					
			Water tanker 6 KL with 5 km lead and 1 trip per hour	hour	1.000	183.00	183.00	P&M-060
			Plate compactor @ 3.5 cum per hour	hour	6.000	467.00	2802.00	P&M-086
			<b>c) Material</b>					
			Cost of water	KL	6.000	253.69	1522.14	M-189
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				366.87	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				648.13	
			Cost for 21 cum = a+b+c+d+e				7129.41	
			<b>Rate per cum = (a+b+c+d+e)/21</b>				339.50	
						<b>say</b>	<b>339.00</b>	
		<b>Note</b>	This analysis provides for median and island with earthen top. In case the surface is required to be turfed or planted with shrubs, the same is required to be provided separately as per analysis given in the chapter on horticulture. In case granular fill is required to be paved, quantities of paving are required to be calculated as per approved design and paid separately.					
4.14	407		<b>Construction of Median and Island with Soil Taken from Borrow Areas</b>					
			Construction of median and Island above road level with approved material brought from borrow pits, spread, sloped and compacted as per clause 407.					
			<b>Unit = cum</b>					
			<b>Taking output = 21 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.160	272.00	43.52	L-12
			Mazdoor	day	4.000	257.00	1028.00	L-13
			<b>b) Machinery</b>					
			Water tanker with 5 km lead	hour	1.000	183.00	183.00	P&M-060
			Plate Compactor @ 3.5 cum per hour	hour	6.000	467.00	2802.00	P&M-086
			Hydraulic Excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.500	1958.00	979.00	P&M-026
			Tipper 10 tonne capacity	tonne.km	52.5 x L	8.86	465.15	Lead = 1 km & P&M-047
			Add 10 per cent of cost of transportation to cover cost of loading and unloading				46.52	
			<b>c) Material</b>					
			Cost of water	KL	6.000	253.69	1522.14	M-189
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				424.16	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				749.35	
			Cost for 21 cum = a+b+c+d+e				8242.83	
			<b>Rate per cum = (a+b+c+d+e)/ 21</b>				392.52	

Calc.  
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Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
					say	<u>393.00</u>	
		<b>Note</b>					
		This analysis provides for median and island with earthen top. In case the surface is required to be turfed or planted with shrubs, the same is required to be provided separately as per analysis given in the chapter on horticulture. In case surface finish is of hard type, the same may be provided separately as per approved design.					
4.15		<b>Construction of Shoulders</b>					
		<b>A. Earthen Shoulders</b>					
		The rate as applicable for sub-grade construction may be adopted.					
		<b>B. Hard Shoulders</b>					
		Rate as applicable for sub-base and or base may be adopted as per approved design.					
		<b>C. Paved shoulders</b>					
		The rate may be adopted as applicable for different layers of pavement depending upon approved design of paved shoulders.					
4.16	409	<b>Footpaths and Separators</b>					
		Construction of footpath/separator by providing a 150 mm compacted granular sub base as per clause 401 and 25 mm thick cement concrete grade M15, over laid with pre-cast concrete tiles in cement mortar 1:3 including provision of all drainage arrangements but excluding kerb channel..					
		<b>Unit = sqm</b>					
		<b>Taking output = 300 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	1.360	272.00	369.92	L-12
		Mason	day	4.000	345.00	1380.00	L-11
		Mazdoor	day	30.000	257.00	7710.00	L-13
		<b>b) Machinery</b>					
		Vibratory road roller 8 -10 tonnes @60 cum per hour	hour	0.750	2029.00	1521.75	P&M-059
		Water tanker 6 KL capacity @ 1 trip per hour	hour	2.000	183.00	366.00	P&M-060
		Concrete mixer 0.4/0.28 cum per hour	hour	6.000	82.30	493.80	P&M-009
		<b>c) Material</b>					
		<b>i) For Granular sub base material</b>					
		53 mm to 26.5 mm @ 35 per cent	cum	20.790	458.22	9526.39	M-029
		26.5 mm to 4.75 mm @ 45 per cent	cum	26.730	499.76	13358.58	M-026
		2.36 mm below @ 20 per cent	cum	11.880	185.94	2208.97	M-022
		<b>ii) For cement concrete grade M157.5 cum</b>					
		Aggregate 12 mm crushed @ 0.9 cum of concrete	cum	6.750	642.67	4338.02	M-052
		Sand @ 0.45 cum/cum of concrete	cum	3.380	150.80	509.70	M-005
		Cement	tonne	1.880	5156.00	9693.28	M-081
		<b>iii) For cement plaster 1:3</b>					
		Sand	cum	3.840	150.80	579.07	M-005
		Cement	tonne	1.830	5156.00	9435.48	M-081
		<b>iv) Pre-cast cement concrete tiles</b>					
		Tiles size 300 x 300 mm and 25 mm thick	each	3300.000	39.73	131109.00	M-184
		<b>v) RCC pipes</b>					
		Pipes 200 mm dia, 2.5 m long for drainage	metre	22.500	168.15	3783.38	M-137
		vi) Cost of water	KL	12.000	253.69	3044.28	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				11965.66	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				21139.33	
		Cost for 300 sqm = a+b+c+d+e				232532.62	
		<b>Rate per sqm = (a+b+c+d+e)/300</b>				775.11	
					say	<u>775.00</u>	
4.17	410	<b>Crusher Run Macadam Base</b>					

Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Providing crushed stone aggregate, depositing on a prepared surface by hauling vehicles, spreading and mixing with a motor grader, watering and compacting with a vibratory roller to clause 410 to form a layer of sub-base/Base.					
		<b>Unit = cum</b>					
		<b>Taking output = 360 cum</b>					
	<b>A</b>	<b>By Mix in Place Method</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	272.00	130.56	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	10.000	257.00	2570.00	L-13
		<b>b) Machinery</b>					
		Tractor attached with rotavator @ 25 cum per hour	hour	12.000	570.00	6840.00	P&M-054
		Motor grader 110 HP	hour	6.000	2697.00	16182.00	P&M-032
		Vibratory roller 8 -10 tonnes @ 60 cum per hour	hour	6.000	2029.00	12174.00	P&M-059
		Water tanker 6 KL capacity	hour	6.000	183.00	1098.00	P&M-060
		<b>c) Material</b>					
		Aggregate at site					
		<b>i) For 53 mm maximum size</b>					
		63 mm to 45 mm @ 33 per cent	cum	157.460	427.69	67344.07	M-038
		22.5 mm to 5.6 mm @ 32 per cent	cum	151.060	528.14	79780.83	M-032
		Below 5.6 mm @ 35 per cent	cum	166.680	200.45	33411.01	M-030
		Cost of water	KL	36.000	253.69	9132.84	M-189
		<b>Or</b>					
		<b>ii) For 45 mm maximum size</b>					
		45 mm to 22.5 mm @ 5 per cent	cum	24.120	479.11	11556.13	M-034
		22.4 mm to 5.6 mm @ 50 per cent	cum	237.600	528.14	125486.06	M-032
		Below 5.6 mm @ 45 per cent	cum	213.480	200.45	42792.07	M-030
		Cost of water	KL	36.000	253.69	9132.84	M-189
4.17A	(i)	<b>For 53 mm maximum size</b>					
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				13758.80	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				24307.21	
		Cost for 360.0 cum = a+b+c+d+e				267379.31	
		<b>Rate per cum = (a+b+c+d+e)/360</b>				742.72	
		<b>or</b>			<b>say</b>	<b>743.00</b>	
4.17A	(ii)	<b>For 45 mm maximum size</b>					
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				13716.70	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				24232.84	
		Cost for 360.0 cum = a+b+c+d+e				266561.20	
		<b>Rate per cum = (a+b+c+d+e)/360</b>				740.45	
					<b>say</b>	<b>740.00</b>	
	<b>Note</b>	Any one of the aggregate grading may be adopted.					
4.17	<b>B</b>	<b>By Mixing Plant :</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 225 cum (450 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.280	272.00	76.16	L-12
		Mazdoor skilled	day	1.000	325.00	325.00	L-15
		Mazdoor	day	6.000	257.00	1542.00	L-13
		<b>b) Machinery</b>					
		Wet mix plant @ 75 tonne per hour	hour	6.000	2791.00	16746.00	P&M-093
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Motor grader 110 HP	hour	6.000	2697.00	16182.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	2029.00	12174.00	P&M-059
		Water tanker 6 KL capacity	hour	3.000	183.00	549.00	P&M-060

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Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>398.70</b>	
		<b>c) Material</b>					
		Aggregate at site					
		<b>i) For 53 mm maximum size</b>					
		63 mm to 45 mm @ 33 per cent	cum	98.400	427.69	42084.70	M-038
		22.5 mm to 5.6 mm @ 32 per cent	cum	94.410	528.14	49861.70	M-032
		Below 5.6 mm @ 35 per cent	cum	104.180	200.45	20882.88	M-030
		<b>Or</b>					
		<b>ii) For 45 mm maximum size</b>					
		45 mm to 22.5 mm @ 5 per cent	cum	15.060	479.11	7215.40	M-034
		22.4 mm to 5.6 mm @ 50 per cent	cum	148.500	528.14	78428.79	M-032
		Below 5.6 mm @ 45 per cent	cum	133.430	200.45	26746.04	M-030
		Cost of water	KL	18.000	253.69	4566.42	M-189
<b>4.17 B</b>	<b>(i)</b>	<b>For 53 mm maximum size</b>					
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				11332.15	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				20020.13	
		Cost for 225 cum = a+b+c+d+e				220221.41	
		<b>Rate per cum = (a+b+c+d+e)/225</b>				978.76	
					<b>say</b>	<b>979.00</b>	
<b>4.17 B</b>	<b>(ii)</b>	<b>For 45 mm maximum size</b>					
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				11579.79	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				20457.63	
		Cost for 225 cum = a+b+c+d+e				225033.93	
		<b>Rate per cum = (a+b+c+d+e)/225</b>				1000.15	
					<b>say</b>	<b>1000.00</b>	
<b>4.18</b>	<b>Suggestive</b>	<b>Lime, Flyash Stabilised Soil Sub-Base</b>					
		Construction of Sub-base using lime - Flyash admixture with granular soil, free from organic matter/ deleterious material or clayey silts and low plasticity clays having PI between 5 and 20 and liquid limit less than 25 and commercial dry lime, slaked at site or pre-slaked with CaO content not less than 50 per cent, Flyash to conform to gradation as per clause 4.3 of IRC: 88-1984, lime + Flyash content ranging between 10 to 30 per cent, the minimum un-confined compressive strength and CBR value after 28 days curing and 4 days soaking to be 7.5kg/sq. cm and 25 per cent respectively, all as specified in IRC: 88-1984.					
		<b>Unit = cum</b>					
		<b>Taking output = 480 cum (720 tonnes, density 1.50 t/cum)</b>					
		<b>Assumptions made</b>					
		Total mass taken for analysis = 720 t					
		Lime + Flyash admixture @ 20 per cent = 0.2 x 720=144 t					
		Soil = 720 -144 = 576 t					
		576 /1.6 = 360 cum					
		Lime + Flyash = 144 t					
		Ratio Lime 4 : Flyash 16					
		Lime = 29 kg.					
		Flyash = 115 kg.					
		<b>a) Labour</b>					
		Mate	day	0.240	272.00	65.28	L-12
		Mazdoor	day	6.000	257.00	1542.00	L-13
		Mazdoor (Skilled)	day	1.000	325.00	325.00	L-15
		<b>b) Machinery</b>					

Analysis of Rates  
**SUB-BASES, BASES ( NON - BITUMINOUS) AND SHOULDERS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Hydraulic Excavator 0.90 cum bucket capacity @ 60cum/hr. for 360 cum soil	hour	6.000	1958.00	11748.00	P&M-026
		Tipper 10T capacity for carriage of soil 576 tonnes	tonne.km	578 x L	8.86	5121.08	Lead =1 km & P&M-047
		Tipper 10T capacity for carriage of 115 tonnes Flyash	tonne.km	115 x L	8.86	1018.90	Lead =1 km & P&M-047
		Tipper 10T capacity for carriage of 29 tonnes of lime from store to work site	hour	3.000	1018.00	3054.00	P&M-048
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>305.40</b>	
		Tractor with disc harrows for pulverisation	hour	6.000	546.00	3276.00	P&M-053
		Motor Grader 110 HP @ 50 cum per hour for mixing in-place and grading	hour	9.600	2697.00	25891.20	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	2029.00	12174.00	P&M-059
		Water tanker 6 KL capacity	hour	12.000	183.00	2196.00	P&M-060
		<b>c) Material</b>					
		Unslaked Lime	tonne	29.000	3555.38	103106.02	M-188
		Compensation for earth taken from private source	cum	360.000	23.78	8560.80	M-092
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				10703.02	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				18908.67	
		Cost for 480 cum = a+b+c+d+e				207995.37	
		<b>Rate per cum= (a+b+c+d+e)/480</b>				433.32	
					<b>say</b>	<b>433.00</b>	
		<b>Note</b>					
		1.Compensation for earth will vary from place to place and will have to be assessed realistically as per particular ground situation. In case earth is available from Govt. land, compensation for earth will not be required. The position is required to be clearly stated in the cost estimate.					
		2.Cost of Flyash has not been considered as same will be available free of cost. Only carriage of Flyash has been provided.					
		3.Lime + Flyash has been taken as 20 per cent of total mass and ratio of lime and Flyash as 1:4 for estimating purposes. Total quantities will be as per approved design.					

L.A.S.  
12/3/19



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## **CHAPTER-5**

# **BASES AND SURFACE COURSES (BITUMINOUS)**

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## **Chapter – 5**

### **Bases and Surface Courses (Bituminous)**

#### **Preamble:**

1. Various alternatives for machines and materials have been provided. The one that suits a particular situation and design may be adopted.
2. The Clauses of MoRT&H Specifications, which have been mentioned for each item, may be referred for detailed specifications and construction procedure. The rate analysis mentions only brief description.
3. The machinery and equipment included in various analysis are as per various specifications of MoRT&H and are mandatory. As per the present trend, contractors are procuring machinery and equipment of higher capacity. Provision has accordingly been made.
4. The outputs taken for the construction equipment are for the compacted quantities of the relevant items and not for loose quantities.
5. In case of prime coat and tack coat, minimum quantities of binder indicated in specifications have been taken. Adjustment, plus or minus, can be made for the variation between this quantity and the actual quantity approved by the Engineer after the preliminary trials.
6. The item of bituminous works required under maintenance has been added in the Chapter on maintenance.
7. Tack coat and prime coat, wherever provided, are required to be measured and paid separately.
8. Cleaning of surface is a part of the prime coat and tack coat. As such cleaning of surface has not been provided for bituminous courses as the same is already catered in prime/tack coat. However, for those cases where such coats are not required to be done, cleaning of surface shall be included.
9. It is presumed that tack coat, where required, will be provided immediately preceding the bituminous layer.
10. Rolling of bituminous courses is required to be done as per Clause 501.6. Provision in the analysis has accordingly been made. It has been observed during actual practice at work sites, that the availability of road roller is generally inadequate. As compaction is the key to good construction, this point is being specifically highlighted to ensure that road rollers are deployed at site as per provision in the rate analyses.
11. Spreading of bituminous materials shall be done by mechanical means except in areas where a mechanical paver cannot have access.
12. The source of all materials to be used on the project must be tested and expressly approved by the Engineer.

*Chh.*  
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13. Quantities of materials taken in the analysis are for the purpose of cost estimate only. The actual quantity shall be as per job mix formula.
14. Choice of grade of bitumen shall be made as per the guidelines given in Appendix-4 of MoRT&H Specifications.
15. The specification and requirements for modified binder with various type of modifiers have been laid down in Clause 521 of MoRT&H Specifications and IRC: SP: 53-2002 which shall be followed.
16. The guidelines given vide Annexure-A to Clause 501 of MoRT&H Specifications in regard to protection of environment shall be followed for a particular situation.
17. The quantities taken as output of the item in the rate analysis are the compacted quantities and the quantities of aggregates taken under the head 'material' are the un-compacted quantities for the procurement purposes.
18. The approximate proportions by weight of different aggregates and bitumen (or by volume in unavoidable cases) necessary to produce the intended mix satisfying the job requirements and meeting the designated specifications are for estimating purpose only. The actual quantities should be worked out on the basis of job mix formula adopted for the job after working out the same in the laboratory for particular aggregates and bitumen approved by the Engineer.

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# Summary of Rate Analysis

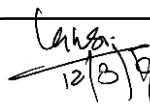
## CHAPTER - 5

### BASES AND SURFACE COURSES (BITUMINOUS)

Item No.	Description	Unit	Rate (₹)
5.1	<b>Prime coat</b> (Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.60 kg/sqm using mechanical means.)	sqm	30.40
5.2	<b>Tack coat</b>		
	<b>Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.</b>	sqm	11.20
5.3	<b>Bituminous Macadam</b> (Providing and laying bituminous macadam with 100-120 TPH hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled as per clauses 501.6 and 501.7 to achieve the desired compaction.)		
(i)	<b>for Grading I (40 mm nominal size)</b>	cum	5413.00
(ii)	<b>for Grading II (19 mm nominal size)</b>	cum	5391.00
5.4	<b>Bituminous Penetration Macadam</b> (Construction of penetration macadam over prepared Base by providing a layer of compacted crushed coarse aggregate using chips spreader with alternate applications of bituminous binder and key aggregates and rolling with a smooth wheeled steel roller 8-10 tonne capacity to achieve the desired degree of compaction.)		
A	<b>50 mm thick</b>	sqm	249.00
B	<b>75 mm thick</b>	sqm	332.00
5.5	<b>Built-Up-Spray Grout</b> (Providing, laying and rolling of built-up-spray grout layer over prepared base consisting of a two layer composite construction of compacted crushed coarse aggregates using motor grader for aggregates. key stone chips spreader may be used with application of bituminous binder after each layer, and with key aggregates placed on top of the second layer to serve as a Base conforming to the line, grades and cross-section specified, the compacted layer thickness being 75 mm)	sqm	202.00
5.6	<b>Dense Graded Bituminous Macadam</b> (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.)		
(i)	<b>for Grading I ( 40 mm nominal size )</b>	cum	6458.00
(ii)	<b>for Grading II ( 19 mm nominal size)</b>	cum	6524.00
5.7	<b>Semi - Dense Bituminous Concrete</b> (Providing and laying semi dense bituminous concrete with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.5 to 5 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 508 complete in all respects)		
(i)	<b>for Grading I ( 13 mm nominal size )</b>	cum	6738.00
(ii)	<b>for Grading II ( 10 mm nominal size)</b>	cum	7131.00
5.8	<b>Bituminous Concrete</b> (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects.)		
(i)	<b>for Grading I ( 13 mm nominal size )</b>	cum	7356.00
(ii)	<b>for Grading II ( 10 mm nominal size)</b>	cum	7329.00
5.9	<b>Surface Dressing</b> (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller.)		
Case - I	<b>19 mm nominal chipping size</b>	sqm	64.00
Case - II	<b>13 mm nominal size chipping</b>	sqm	55.00

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
<b>5.10</b>	<b>Open - Graded Premix Surfacing</b> (Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen or cut-back or emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 tonne capacity, finished to required level and grades.)		
(i)	<b>Case - I: Mechanical method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour .</b>	sqm	110.00
(ii)	<b>Case - II: Open-Graded Premix Surfacing using cationic Bitumen Emulsion</b>	sqm	128.00
<b>5.11</b>	<b>Close Graded Premix Surfacing/Mixed Seal Surfacing (Mechanical means using HMP of appropriate capacity not less than 75 tonnes/hour. Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-a) or 13.2 mm to 0.09 mm (Type-b) aggregates using penetration grade bitumen to the required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade. )</b>		
	<b>i) For Type A</b>	sqm	129.00
	<b>i) For Type B</b>	sqm	122.00
<b>5.12</b>	<b>Seal Coat</b> (Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A and B seal coats)		
(i)	<b>Case - I : Type A</b>	sqm	48.00
(ii)	<b>Case - II : Type B</b> (Providing and laying of premix sand seal coat with HMP of appropriate capacity not less than 75 tonnes/ hours using crushed stone chipping 6.7 mm size and penetration bitumen of suitable grade.)	sqm	44.00
<b>5.13</b>	<b>Supply of Stone Aggregates for Pavement Courses</b> (Supply of stone aggregates from approved sources conforming to the physical requirement, specified in the respective specified clauses, including royalties, fees rents, collection, transportation, stacking and testing and measured in cum as per clause 514.5 Competitive market rates to be ascertained. Alternatively, rates for stone crushing given in chapter 1 may be adopted, if found economical. In case for supply of aggregates at site are not available, nearest crusher site may be ascertained. Loading and un-loading charges and cost of carriage may be added to these rates to arrive at the cost at site.)	cum	
<b>5.14</b>	<b>Mastic Asphalt</b> (Providing and laying 25 mm thick mastic asphalt wearing course with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine-grained hard stone chipping of 13.2 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.)	sqm	487.00
<b>5.15</b>	<b>Slurry Seal</b> (Providing and laying slurry seal consisting of a mixture of fine aggregates, portland cement filler, bituminous emulsion and water on a road surface including cleaning of surface, mixing of slurry seal in a suitable mobile plant, laying and compacting to provide even riding surface.)		
(i)	<b>5 mm thickness</b>	sqm	61.00
(ii)	<b>3 mm thickness</b>	sqm	43.00
(iii)	<b>1.5 mm thickness</b>	sqm	26.60
<b>5.16</b>	<b>Recycling of Bituminous Pavement with Central Recycling Plant</b> (Recycling pavement by cold milling of exiting bituminous layers, planning the surface after cold milling, reclaiming excavated material to the extent of 30 % of the required quantity, hauling and stock piling the reclaimed material near the central recycling plant after carrying out necessary checks and evaluation, adding fresh material including rejuvenators as required, mixing in a hot mix plant, transporting and laying at site and compacting to the required grade, level and thickness, all as specified in clause 517.)	cum	6268.00
<b>5.17</b>	<b>Fog Spray</b>	sqm	36.00
<b>added</b>	<b>1. In case it is decided by the engineer to blind the fog spray, the following may be added</b>	sqm	4.20
<b>5.18</b>	<b>Bituminous Cold Mix ( Including Gravel Emulsion)</b> (Providing, laying and rolling of bituminous cold mix on prepared base consisting of a mixture of unheated mineral aggregate and emulsified or cutback bitumen, including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing to specified grades and levels.)		
(i)	<b>Using bitumen emulsion and 9.5 mm or 13.2 mm nominal size aggregate</b>	cum	9381.00
(ii)	<b>Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate</b>	cum	9316.00
(iii)	<b>Using cutback bitumen and 9.5 mm or 13.2 mm nominal size aggregate</b>	cum	5528.00
(iv)	<b>Using cutback bitumen and 19 mm or 26.5 mm nominal size aggregate</b>	cum	5445.00

  
 12/8/19

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
5.19	<b>Sand Asphalt Base Course</b> (Providing, laying and rolling sand-asphalt base course composed of sand, mineral filler and bituminous binder on a prepared sub-grade or sub-base to the lines, levels, grades and cross sections as per the drawings including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing.)	cum	6206.00
5.20	<b>Modified Binder</b> (Supply of modified binder produced by mixing bitumen with modifier such as natural rubber or crumb rubber or any other polymer found compatible with bitumen and which allows properties given in clause 521.3 and IRC: SP: 53 blending of modifier with bitumen to be done either at the refinery or at the site plant capable of producing the modified binder to be delivered in drums which shall be agitated in melted condition using suitable device before use to ensure uniform dispersion.)	tonne	
5.21	<b>Crack Prevention Courses</b>		
(i)	<b>Stress Absorbing Membrane (SAM) crack width less than 6 mm</b> (Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width below 6 mm after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 9 kg per 10 sqm and spreading 5.6 mm crushed stone aggregates @ 0.11 cum per 10 sqm with hydraulic chip spreader, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902.)	sqm	47.00
(ii)	<b>Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm</b> (Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width 6 to 9 mm after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 11 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902.)	sqm	57.00
(iii)	<b>Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 %</b> (Providing and laying a single coat of a stress absorbing membrane over a cracked road surface, with crack width above 9 mm and cracked area above 50 % after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 15 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902.)	sqm	75.00
(iv)	<b>Case - IV : Bitumen Impregnated Geotextile</b> (Providing and laying a bitumen impregnated geotextile layer after cleaning the road surface, geotextile conforming to requirements of clause 704.3, laid over a tack coat with 1.05 kg per sqm of paving grade bitumen 80 - 100 penetration and constructed to the requirement of clause 704.4.5.)	sqm	146.00
5.22	<b>Recipe Cold Mix</b> (Providing and laying of premix of crushed stone aggregates and emulsion binder, mixed in a batch type cold mixing plant, laid over prepared surface, by paver finisher, rolled with a pneumatic tyred roller initially and finished with a smooth steel wheel roller, all as per clause 519.3.)		
(i)	<b>75 mm thickness</b>	cum	5797.00
(ii)	<b>40 mm thickness</b>	cum	8627.00
(iii)	<b>25 mm thickness</b>	cum	9721.00

  
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Analysis of Rates  
**CHAPTER - 5**  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
5.1	502	<b>Prime Coat</b>					
		Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate of 0.60 kg/sqm using mechanical means.					
		<b>Unit = sqm</b>					
		<b>Taking output = 3500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	2.800	555.00	1554.00	P&M-031
		Air compressor 250 cfm	hour	2.800	481.00	1346.80	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	2.000	1613.00	3226.00	P&M-004
		Water tanker 6 KL capacity @ 1 tripper hour	hour	1.000	183.00	183.00	P&M-060
		<b>c) Material</b>					
		Bitumen emulsion @ 0.6 kg per sqm	tonne	2.100	39475.00	82897.50	M-077
		Cost of water	KL	6.000	253.69	1522.14	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				5475.91	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				9674.11	
		Cost for 3500 sqm = a+b+c+d+e				106415.22	
		<b>Rate per sqm = (a+b+c+d+e)/3500</b>				30.40	
					<b>say</b>	<b>30.40</b>	
		<b>Note</b> Bitumen primer has been provided @ 0.60 kg per sqm as per clause 502.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and the actual quantity approved by the Engineer after the preliminary trials referred to in clause No. 502.4.3.					
5.2	503	<b>Tack Coat</b>					
		Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.20 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom.					
		<b>Unit = sqm</b>					
		<b>Taking output = 3500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	2.800	555.00	1554.00	P&M-031
		Air compressor 250 cfm	hour	2.800	481.00	1346.80	P&M-001
		Emulsion pressure distributor @ 1750 sqm per hour	hour	2.000	1203.00	2406.00	P&M-016
		<b>c) Material</b>					
		Bitumen emulsion @ 0.2 kg per sqm	tonne	0.700	39475.00	27632.50	M-077
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				2008.50	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				3548.36	
		Cost for 3500 sqm = a+b+c+d+e				39031.92	
		<b>Rate per sqm = (a+b+c+d+e)/3500</b>				11.15	
					<b>say</b>	<b>11.20</b>	
		<b>Note</b> 1. Bitumen emulsion has been provided @ 0.20 kg per sqm as per clause 503.8. Payment shall be made with adjustment, plus or minus, for the variation between this quantity and actual quantity approved by the Engineer after preliminary trials referred to in clause No. 503.4.3.					
		2. An output of 3500 sqm has been considered in case of prime coat and tack coat which can be covered by bituminous courses on the same day.					
5.3	504	<b>Bituminous Macadam</b>					

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Providing and laying bituminous macadam with 100-120 TPH hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled as per clauses 501.6 and 501.7 to achieve the desired compaction.					
		<b>Unit = cum</b>					
		<b>Taking output = 205 cum (450 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	257.00	4112.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP 100-120 TPH @ 75 tonne per hour actual output	hour	6.000	39088.00	234528.00	P&M-022
		Mechanical broom hydraulic @ 1250 sqm per hour	hour	2.200	555.00	1221.00	P&M-031
		Air compressor 250 cfm	hour	2.200	481.00	1058.20	P&M-001
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	3505.00	21030.00	P&M-034
		Generator 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>398.70</b>	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	2029.00	7913.10	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		<b>c) Material</b>					
		<b>i) Bitumen@ 3.3 per cent of mix</b>	tonne	14.850	32830.00	487525.50	M-074
		weight of mix = 205 x 2.2 = 450 tonne					
		<b>ii) Aggregate</b>					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 14.85 tonnes					
		Weight of aggregate = 450 -14.85 = 435.15 tonnes					
		<b>Taking density of aggregate = 1.5 ton/cum</b>					
		Volume of aggregate = 290.1 cum					
		<b>*Grading I ( 40 mm nominal size )</b>					
		37.5 - 25 mm 15 per cent	cum	43.510	479.11	20846.08	M-049
		25 - 10 mm 45 per cent	cum	130.550	612.59	79973.62	M-046
		10 - 5 mm 25 per cent	cum	72.530	528.94	38364.02	M-040
		5 mm and below 15 per cent	cum	43.510	200.45	8721.58	M-030
		<b>or</b>					
		<b>Grading II (19 mm nominal size)</b>					
		25 - 10 mm 40 per cent	cum	116.040	612.59	71084.94	M-046
		10 - 5 mm 40 per cent	cum	116.040	528.94	61378.20	M-040
		5 mm and below 20 per cent	cum	58.020	200.45	11630.11	M-030
		* Any one of the alternative may be adopted as per approved design					
	(i)	<b>for Grading I ( 40 mm nominal size )</b>					
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				57100.68	

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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		e) Contractor's profit @ 0.1 on (a+b+c+d)				100877.87	
		Cost for 205 cum = a+b+c+d+e				1109656.52	
		Rate per cum = (a+b+c+d+e)/205 (For Grading I)				5412.96	
					say	<u>5413.00</u>	
		(ii) for Grading II (19 mm nominal size)					
		d) Overhead charges @ 0.06 on (a+b+c)				56871.96	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				100473.79	
		Cost for 205 cum = a+b+c+d+e				1105211.67	
		Rate per cum = (a+b+c+d+e)/205 (For Grading-II)				5391.28	
					say	<u>5391.00</u>	
		<b>Note</b> 1. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a factor of 0.65.					
		2. Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case BM is laid over freshly laid tack coat, provision of Mechanical broom and 2 mazdoors for the same shall be deleted as the same has been included in the cost of tack coat.					
5.4	505	<b>Bituminous Penetration Macadam</b>					
		Construction of penetration macadam over prepared Base by providing a layer of compacted crushed coarse aggregate using chips spreader with alternate applications of bituminous binder and key aggregates and rolling with a smooth wheeled steel roller 8-10 tonne capacity to achieve the desired degree of compaction					
	A	50 mm thick					
		Unit = sqm					
		Taking output = 4500 sqm (225 cum)					
		a) Labour					
		Mate	day	0.320	272.00	87.04	L-12
		Mazdoor including for brooming of key aggregates	day	6.000	257.00	1542.00	L-13
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		b) Machinery					
		Hydraulic self propelled chip spreader both for aggregates and key aggregates @ 1500 sqm per hour for 4500 x 2 sqm = 9000 sqm	hour	6.000	3964.00	23784.00	P&M-025
		Bitumen pressure distributor for @ 1750 sqm per hour	hour	2.570	1613.00	4145.41	P&M-004
		Tipper 5.5 cum capacity for carriage of aggregates from stockpile to chip spreader	hour	10.000	1018.00	10180.00	P&M-048
		Vibratory roller 8 tonnes	hour	6.000	2029.00	12174.00	P&M-059
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		c) Material					
		Bitumen @ 5 kg per sqm	tonne	22.500	32830.00	738675.00	M-074
		Crushed stone coarse aggregate passing 45 mm and retained on 2.8 mm sieve @ 0.06 cum per sqm	cum	270.000	470.93	127151.10	M-033
		Key aggregates passing 22.4 mm and retained on 2.8 mm sieve @ 0.015 cum per sqm	cum	67.500	528.14	35649.45	M-031
		d) Overhead charges @ 0.06 on (a+b+c)				57736.56	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				102001.26	
		Cost for 4500 sqm = a+b+c+d+e				1122013.82	
		Rate per sqm = (a+b+c+d+e)/4500				249.34	

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
					say	<u>249.00</u>	
		<b>Note</b> 2 tippers will be needed to match the capacity of chip spreader and front end loader.					
5.4	B	<b>75 mm thick</b>					
		<b>Unit = sqm</b>					
		<b>Taking output = 4500 sqm (337.5 cum compacted).</b>					
		<b>a) Labour</b>					
		Mate	day	0.400	272.00	108.80	L-12
		Mazdoor including for brooming of key aggregates	day	8.000	257.00	2056.00	L-13
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		<b>b) Machinery</b>					
		Hydraulic self propelled chip spreader both for aggregates and key aggregates @ 1500 sqm per hour for 4500 x 2 sqm	hour	6.000	3964.00	23784.00	P&M-025
		Bitumen pressure distributor for @ 1750 sqm per hour	hour	2.570	1613.00	4145.41	P&M-004
		Tipper 5.5 cum capacity for carriage of aggregates from stockpile to chip spreader	hour	10.000	1018.00	10180.00	P&M-048
		Vibratory roller 8 tonnes	hour	6.000	2029.00	12174.00	P&M-059
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		<b>c) Material</b>					
		Bitumen @ 6.8 kg per sqm	tonne	30.600	32830.00	1004598.00	M-074
		Crushed stone coarse aggregate (loose passing 63 mm and retained on 2.8 mm sieve @ 0.09 cum per sqm	cum	405.000	427.80	173259.00	M-037
		Key aggregates passing 26.5 mm and retained on 2.8 mm sieve @ 0.018 cum per sqm	cum	81.000	499.76	40480.56	M-026
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				76780.43	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				135645.42	
		Cost for 4500 sqm = a+b+c+d+e				1492099.62	
		<b>Rate per sqm = (a+b+c+d+e)/4500</b>				331.58	
					say	<u>332.00</u>	
		<b>Note</b> 2 tippers and 2 rollers will be needed to match the capacity of chip spreader and front end loader.					
5.5	506	<b>Built-up-Spray Grout</b>					
		Providing, laying and rolling of built-up-spray grout layer over prepared base consisting of a two layer composite construction of compacted crushed coarse aggregates using motor grader for aggregates. Key stone chips spreader may be used with application of bituminous binder after each layer, and with key aggregates placed on top of the second layer to serve as a Base conforming to the line, grades and cross-section specified, the compacted layer thickness being 75 mm					
		<b>Unit = sqm</b>					
		<b>Taking output = 3000 sqm (225 cum)</b>					
		<b>a) Labour</b>					
		Mate	day	0.400	272.00	108.80	L-12
		Mazdoor including for brooming of key aggregates	day	8.000	257.00	2056.00	L-13
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		<b>b) Machinery</b>					
		Hydraulic self propelled chip spreader both for aggregates and key aggregates @ 1500 sqm per hour for 3000 x 3 sqm	hour	6.000	3964.00	23784.00	P&M-025
		Bitumen pressure distributor for 3000 x 2 sqm @ 1750 sqm per hour	hour	3.430	1613.00	5532.59	P&M-004
		Tipper 5.5 cum capacity	hour	10.000	1018.00	10180.00	P&M-048
		Vibratory roller 8 tonnes	hour	6.000	2029.00	12174.00	P&M-059

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**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		<b>c) Material</b>					
		Bitumen 30 kg per 10 sqm @ 15 kg per 10 sqm for each layer	tonne	9.000	32830.00	295470.00	M-074
		Crushed stone coarse aggregate passing 53 mm and retained on 2.8 mm sieve @ 0.5 cum per 10 sqm for each layer	cum	300.000	470.93	141279.00	M-035
		Key aggregates passing 22.4 mm and retained on 2.8 mm sieve @ 0.13 cum per 10 sqm	cum	39.000	528.14	20597.46	M-031
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				31204.19	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				55127.40	
		Cost for 3000 sqm = a+b+c+d+e				606401.45	
		<b>Rate per sqm = (a+b+c+d+e)/3000</b>				202.13	
					<b>say</b>	<b>202.00</b>	
		<b>Note</b> 2 tippers will be needed to match the capacity of hydraulic chip spreader and front end loader.					
5.6	507	<b>Dense Graded Bituminous Macadam</b>					
		Providing and laying dense graded bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 per cent by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.					
		<b>Unit = cum</b>					
		<b>Taking output = 195 cum (450 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	257.00	4112.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	39088.00	234528.00	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	3505.00	21030.00	P&M-034
		Generator 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead = 1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	2029.00	7913.10	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		<b>c) Materials</b>					
		<b>Bitumen @ 4.25 per cent of weight of mix</b>	tonne	19.130	32830.00	628037.90	M-074
		<b>Aggregate</b>					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 19.13 tonnes					
		Weight of aggregate = 450 - 19.13 = 430.87 tonnes					
		<b>Taking density of aggregate = 1.5 ton/cum</b>					
		Volume of aggregate = 287.25 cum					
		<b>Grading - I 40 mm (Nominal Size)</b>					

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		37.5 - 25 mm 22 per cent	cum	63.190	479.11	30274.96	M-049
		25 - 10 mm 13 per cent	cum	37.340	612.59	22874.11	M-046
		10 - 4.75 mm 19 per cent	cum	54.580	528.94	28869.55	M-040
		4.75 mm and below 44 per cent	cum	126.390	200.45	25334.88	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		or					
		<b>Grading - II 19 mm (Nominal Size)</b>					
		25 - 10 mm 30 per cent	cum	86.160	612.59	52780.75	M-046
		10 - 5 mm 28 per cent	cum	80.430	528.94	42542.64	M-040
		5 mm and below 40 per cent	cum	114.900	200.45	23031.71	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		* Any one of the alternative may be adopted as per approved design					
	(i)	<b>For Grading I ( 40 mm nominal size )</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				64800.40	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				114480.72	
		Cost for 195 cum = a+b+c+d+e				1259287.87	
		Rate per cum = (a+b+c+d+e)/195 (For Grading I)				6457.89	
					say	<u>6458.00</u>	
	(ii)	<b>For Grading II (19 mm nominal size)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				65460.50	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				115646.89	
		Cost for 195 cum = a+b+c+d+e				1272115.75	
		Rate per cum = (a+b+c+d+e)/195 (For Grading-II)				6523.67	
					say	<u>6524.00</u>	
	Note	*1. Although the roller are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a factor of 0.65.					
		2.Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case DBM is laid over freshly laid tack coat, provision of mechanical broom and 2 mazdoors shall be deleted as the same has been included in the cost of tack coat.					
		5. The individual density for each size of aggregates to be used for construction i.e. 37.5-25 mm, 25-10 mm etc. should be found in the laboratory and accordingly the quantities should be ammended for use in field. The average density of 1.5 tonne/cum is only a reference density in this Data Book.					
		6. The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e., excluding the weight of bitumen. The weight of filler will also be 2 per cent by weight of dry aggregates.					
5.7	508	<b>Semi-Dense Bituminous Concrete</b>					

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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Providing and laying semi dense bituminous concrete with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.5 to 5 per cent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 508 complete in all respects.					
		<b>Unit = cum</b>					
		<b>Taking output = 195 cum (450 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	257.00	4112.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	39088.00	234528.00	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	3505.00	21030.00	P&M-034
		Generator 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	2029.00	7913.10	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		<b>c) Material</b>					
		<b>* Grading I: 13 mm (Nominal Size)</b>					
		i) Bitumen @ 4.5 per cent of weight of mix	tonne	20.250	32830.00	664807.50	M-074
		ii) Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 20.25 tonnes					
		Weight of aggregate = 450-20.25 = 429.75 tonnes					
		Taking density of aggregate = 1.5 ton/cum					
		Volume of aggregate = 286.5 cum					
		13.2 - 10 mm 20 per cent	cum	57.300	642.67	36824.99	M-044
		10 - 5 mm 38 per cent	cum	108.870	528.94	57585.70	M-040
		5 mm and below 40 per cent	cum	114.600	200.45	22971.57	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		or					
		<b>Grading II: 10 mm (Nominal Size)</b>					
		Bitumen @ 5 per cent of weight of mix	tonne	22.500	32830.00	738675.00	M-074
		weight of mix = 450 tonne					
		Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 22.5 tonnes					
		Weight of aggregate = 450 - 22.50 = 427.50 tonnes					
		Taking density of aggregate = 1.5 ton/cum					
		Volume of aggregate = 285 cum					
		9.5 - 4.75 mm @ 57 per cent	cum	162.450	528.94	85926.30	M-040



Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		4.75 and below @ 41 per cent	cum	116.850	200.45	23422.58	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		<b>*Any one of the alternative may be adopted as per approved design</b>					
	(i)	<b>for Grading I ( 13 mm nominal size )</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				67608.31	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				119441.34	
		Cost for 195 cum = a+b+c+d+e				1313854.76	
		Rate per cum = (a+b+c+d+e)/195 (For Grading I)				6737.72	
					say	<b>6738.00</b>	
5.7	(ii)	<b>for Grading II (10 mm nominal size)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				71558.35	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				126419.76	
		Cost for 195 cum = a+b+c+d+e				1390617.36	
		Rate per cum = (a+b+c+d+e)/195 (For Grading-II)				7131.37	
					say	<b>7131.00</b>	
	Note	*1. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a factor of 0.65					
		2.Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case SDBC is laid over freshly laid tack coat, provision of broom and 2 mazdoor shall be deleted as the same has been included in the cost of tack coat.					
		5. The quantity of Bitumen to be adjusted as per job mix formula.					
5.8	509	<b>Bituminous Concrete</b>					
		Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 per cent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects					
		<b>Unit = cum</b>					
		<b>Taking output = 191 cum (450 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	257.00	4112.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	39088.00	234528.00	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	3505.00	21030.00	P&M-034
		Generator 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017

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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	2029.00	7913.10	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		<b>c) Material</b>					
		i) Bitumen @ 5 per cent of weight of mix	tonne	22.500	32830.00	738675.00	M-074
		ii) Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 22.5 tonnes					
		Weight of aggregate = 450 -22.50 = 427.50 tonnes					
		<b>Taking density of aggregate = 1.5 ton/cum</b>					
		Volume of aggregate = 285 cum					
		<b>* Grading - I-19 mm (Nominal Size)</b>					
		20 - 10 mm 35 per cent	cum	99.750	642.67	64106.33	M-045
		10 - 5 mm 23 per cent	cum	65.550	528.94	34672.02	M-040
		5 mm and below 40 per cent	cum	114.000	200.45	22851.30	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		<b>or</b>					
		<b>Grading - II-13 mm (Nominal Size)</b>					
		13.2 - 10 mm 30 per cent	cum	85.500	642.67	54948.29	M-044
		10 - 5 mm 25 per cent	cum	71.250	528.94	37686.98	M-040
		5 mm and below 43 per cent	cum	122.550	200.45	24565.15	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		<b>*Any one of the alternative may be adopted as per approved design</b>					
	(i)	<b>for Grading-I ( 13 mm nominal size )</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				72295.20	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				127721.52	
		Cost for 191 cum = a+b+c+d+e				1404936.73	
		Rate per cum = (a+b+c+d+e)/191				7355.69	
					say	<b>7356.00</b>	
5.8	(ii)	<b>for Grading-II (10 mm nominal size)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				72029.45	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				127252.02	
		Cost for 191 cum = a+b+c+d+e				1399772.23	
		Rate per cum = (a+b+c+d+e)/191 (For Grading-II)				7328.65	
					say	<b>7329.00</b>	
	Note	*1. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a factor of 0.65.					
		2.Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case BC is laid over freshly laid tack coat, provision of mechanical broom and 2 mazdoors shall be deleted as the same has been included in the cost of tack coat.					

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		5. The individual density for each size of aggregates to be used for construction i.e. 37.5-25 mm, 25-10 mm etc. should be found in the laboratory and accordingly the quantities should be amended for use in field. The average density of 1.5 tonne/cum is only a reference density in this Data Book.					
		6. The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e., excluding the weight of bitumen. The weight of filler will also be 2 per cent by weight of dry aggregates.					
5.9	510	<b>Surface Dressing</b>					
		Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller.					
		<b>Unit = sqm</b>					
		<b>Taking output = 9000 sqm</b>					
		<b>Case - I 19 mm nominal chipping size</b>					
		<b>a) Labour</b>					
		Mate	day	0.440	272.00	119.68	L-12
		Mazdoor	day	9.000	257.00	2313.00	L-13
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	555.00	3996.00	P&M-031
		Air compressor 250 cfm	hour	7.200	481.00	3463.20	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	3964.00	23784.00	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	1018.00	6108.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Bitumen pressure distributor	hour	6.000	1613.00	9678.00	P&M-004
		Smooth wheeled roller 8-10 tonne weight	hour	6.000	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		Bitumen @ 1.20 kg per sqm	tonne	10.800	32830.00	354564.00	M-074
		Crushed stone chipping, 19 mm nominal size @ 0.015 cum per sqm	cum	135.000	550.85	74364.75	M-053
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				29517.88	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				52148.25	
		Cost for 9000 sqm = a+b+c+d+e				573630.76	
		<b>Rate per sqm = (a+b+c+d+e)/9000</b>				63.74	
					<b>say</b>	<b>64.00</b>	
5.9		<b>Case - II 13 mm nominal size chipping</b>					
		<b>a) Labour</b>					
		Mate	day	0.440	272.00	119.68	L-12
		Mazdoor	day	9.000	257.00	2313.00	L-13
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	555.00	3996.00	P&M-031
		Air compressor 250 cfm	hour	7.200	481.00	3463.20	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	3964.00	23784.00	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	1018.00	6108.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1613.00	9678.00	P&M-004
		Vibratory roller 8-10 tonne weight	hour	6.000	2029.00	12174.00	P&M-059
		<b>c) Material</b>					
		Bitumen @ 1.00 kg per sqm	tonne	9.000	32830.00	295470.00	M-074

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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Crushed stone chipping, 13 mm nominal size @ 0.01 cum per sqm	cum	90.000	642.67	57840.30	M-052
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				25430.05	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				44926.42	
		Cost for 9000 sqm = a+b+c+d+e				494190.65	
		<b>Rate per sqm = (a+b+c+d+e)/9000</b>				54.91	
					<b>say</b>	<b>55.00</b>	
		<b>Note</b> 1. Where the proposed aggregate fails to pass the stripping test, an approved adhesion agent may be added to the binder as per clause 510.2.4. Alternatively, chips may be pre-coated as per clause 510.2.5.					
		2. Input for the second coat, where required, will be the same as per the 1st coat mentioned above.					
<b>5.10</b>	<b>511</b>	<b>Open - Graded Premix Surfacing</b>					
		Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen or cut-back or emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 tonne capacity, finished to required level and grades.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10250 sqm (205 cum)</b>					
		<b>(i) Case - I: Mechanical method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour .</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	257.00	4112.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		i) Batch type HMP 75 tonne per hour	hour	6.000	39088.00	234528.00	P&M-022
		ii) Electric Generator Set 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		iii) Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		iv) Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		v) Paver finisher hydrostatic with sensor attachment	hour	6.000	3505.00	21030.00	P&M-034
		iv) Smooth wheeled/tandem roller 8-10 tonnes weight	hour	6.000	1722.00	10332.00	P&M-045
		<b>c) Material</b>					
		Bitumen @ 14.60 kg per 10 sqm	tonne	14.970	32830.00	491465.10	M-074
		Crushed stone chipping, 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	276.750	614.17	169971.55	M-043
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				58083.71	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				102614.55	
		Cost for 10250 sqm = a+b+c+d+e				1128760.09	
		<b>Rate per sqm = (a+b+c+d+e)/10250</b>				110.12	
					<b>say</b>	<b>110.00</b>	

Calc.  
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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Note</b> If a premix sand seal coat of 'B' type is proposed, the same is required to be provided over the open graded premix carpet immediately on the same day. As the same HMP and other machines will be used for laying of premix sand seal coat, out of 6 effective working hours, 4.00 hours may be utilised for laying of premix carpet and balance 2.00 hours for the seal coat. The rate for the premix sand seal coat under clause 513 (case II) has been worked out accordingly by utilising the HMP for 2.00 hours for the purpose of seal coat. In case type 'A' seal coat is proposed, HMP can be worked for six hours for the premix carpet as type 'A' seal coat does not require the use of HMP.					
5.10		<b>(ii) Case - II: Open-Graded Premix Surfacing using cationic Bitumen Emulsion</b>					
		<b>Unit = sqm</b>					
		<b>Taking output = 900 sqm (24.3 cum)</b>					
		<b>a) Labour</b>					
		Mate	day	0.800	272.00	217.60	L-12
		Mazdoor	day	18.000	257.00	4626.00	L-13
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		<b>b) Machinery</b>					
		Concrete mixer 0.4/0.28 cum capacity	hour	6.000	82.30	493.80	P&M-009
		Smooth wheeled steel roller 8-10 tonne	hour	6.000	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		Cationic Bitumen Emulsion @ 21.50 kg per 10 sqm	tonne	1.940	37539.00	72825.66	M-073
		Crushed stone aggregates 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	24.300	614.17	14924.33	M-043
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				5905.40	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				10432.88	
		Cost for 900 sqm = a+b+c+d+e				114761.67	
		<b>Rate per sqm = (a+b+c+d+e)/900</b>				127.51	
					<b>say</b>	<b>128.00</b>	
5.11	512	<b>Close Graded Premix Surfacing/Mixed Seal Surfacing</b>					
		<b>Case I</b> Mechanical means using HMP of appropriate capacity not less than 75 tonnes/hour.					
		Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-A) or 13.2 mm to 0.09 mm (Type-B) aggregates using penetration grade bitumen to the required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10250 sqm (205 cum)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	257.00	4112.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		i) HMP of appropriate capacity - 75 t per hour	hour	6.000	39088.00	234528.00	P&M-022
		ii) Electric Generator Set 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		iii) Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		iv) Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	

*Calc.*  
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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		v) Paver finisher hydrostatic with sensor attachment	hour	6.000	3505.00	21030.00	P&M-034
		iv) Smooth wheeled 8-10 tonnes weight	hour	6.000	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		<b>Type - A</b>					
		* Bitumen @ 22 kg per 10 sqm	tonne	22.500	32830.00	738675.00	M-074
		Stone crushed aggregates 11.2 mm to 0.09 @ 0.27 cum per 10 sqm	cum	276.750	345.52	95622.66	M-041
		or					
		<b>Type - B</b>					
		Bitumen @ 19 kg per 10 sqm	tonne	19.480	32830.00	639528.40	M-074
		Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	276.750	470.04	130083.57	M-042
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				68116.61	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				120339.35	
		Cost for 10250 sqm = a+b+c+d+e				1323732.80	
		<b>Rate per sqm = (a+b+c+d+e)/10250</b>				129.14	
		For Type 'A'			say	<u>129.00</u>	
		For Type 'B'			say	<u>122.00</u>	Sub_Analysis
		* Any one of the alternative may be adopted					
5.12	513	<b>Seal Coat</b>					
		Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A and B seal coats					
		<b>Unit = sqm</b>					
		<b>Taking output = 10250 sqm (92.25 cum)</b>					
		<b>(i) Case - I : Type A</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	272.00	65.28	L-12
		Mazdoor	day	6.000	257.00	1542.00	L-13
		<b>b) Machinery</b>					
		Hydraulic self propelled chip spreader	hour	6.000	3964.00	23784.00	P&M-025
		Tipper 5.5 cum capacity	hour	6.000	1018.00	6108.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1613.00	9678.00	P&M-004
		Smooth wheeled roller 8 -10 tonne weight	hour	6.000	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		Bitumen @ 9.80 kg per 10 sqm	tonne	10.050	32830.00	329941.50	M-074
		Crushed stone chipping of 6.7 mm size defined as 100 per cent passing 11.2 mm sieve and retained on 2.36 mm sieve applied @ 0.09 cum per 10 sqm	cum	92.250	408.74	37706.27	M-050
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				25304.94	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				44705.40	
		Cost for 10250 sqm = a+b+c+d+e				491759.39	
		<b>Rate per sqm = (a+b+c+d+e)/10250</b>				47.98	
					say	<u>48.00</u>	
		<b>Note</b> Since seal coat is provided immediately over the bituminous layers, mechanical broom for clearing has not been catered.					
5.12		<b>(ii) Case - II : Type B</b>					
		Providing and laying of premix sand seal coat with HMP of appropriate capacity not less than 75 tonnes/ hours using crushed stone chipping 6.7 mm size and penetration bitumen of suitable grade.					
		<b>Unit = sqm</b>					
		<b>Taking output = 7858 sqm (47.16 cum)</b>					
		<b>a) Labour</b>					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	0.160	272.00	43.52	L-12
		Mazdoor	day	4.000	257.00	1028.00	L-13
		<b>b) Machinery</b>					
		HMP of 75 tonnes/hour.	hour	2.000	39088.00	78176.00	P&M-022
		Electric Generator Set 250 KVA	hour	2.000	3691.00	7382.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	2.000	1373.00	2746.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	104 x 'L'	8.86	921.44	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				92.14	
		Paver finisher hydrostatic with sensor attachment	hour	2.000	3505.00	7010.00	P&M-034
		Smooth wheeled 8-10 tonnes capacity	hour	2.000	781.00	1562.00	P&M-044
		<b>c) Material</b>					
		Bitumen @ 6.80 kg per 10 sqm	tonne	5.340	32830.00	175312.20	M-074
		Crushed stone chipping of 6.7 mm size defined as passing 11.2 mm sieve and retained on 2.36 mm sieve applied @ 0.06 cum per 10 sqm	cum	47.160	408.74	19276.18	M-050
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				17612.97	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				31116.25	
		Cost for 7858 sqm = a+b+c+d+e				342278.70	
		<b>Rate per sqm = (a+b+c+d+e)/7858</b>				43.56	
					<b>say</b>	<b>44.00</b>	
		<b>Note</b> Since seal coat is required to be provided over the premix carpet on the same day, out of the 6 working hours of the HMP, 4.00 hours are proposed to be utilised for the premix carpet and the balance 2.00 hours for the seal coat. Hence 2.00 hours have been considered for this case. This may be linked to rate analysis worked out under clause 511.					
5.13	514	<b>Supply of Stone Aggregates for Pavement Courses</b>					
		Supply of stone aggregates from approved sources conforming to the physical requirement, specified in the respective specified clauses, including royalties, fees rents, collection, transportation, stacking and testing and measured in cum as per clause 514.5					
		Competitive market rates to be ascertained. Alternatively, rates for stone crushing given in chapter 1 may be adopted, if found economical. In case for supply of aggregates at site are not available, nearest crusher site may be ascertained. Loading and un-loading charges and cost of carriage may be added to these rates to arrive at the cost at site.					
5.14	515	<b>Mastic Asphalt</b>					
		Providing and laying 25 mm thick mastic asphalt wearing course with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated finegrained hard stone chipping of 13.2 mm nominal size at the rate of 0.005 cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces is not less than 100 °C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515					
		<b>Unit = sqm</b>					
		<b>Taking output = 35.00 sqm (0.87 cum ) assuming a density of 2.3 tonnes/cum.-2 tonnes</b>					
		<b>a) Labour</b>					
		Mate	day	0.440	272.00	119.68	L-12
		Mazdoor	day	10.000	257.00	2570.00	L-13
		Mazdoor skilled	day	1.000	325.00	325.00	L-15

*Chandra*  
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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	0.060	555.00	33.30	P&M-031
		Air compressor 250 cfm	hour	0.060	481.00	28.86	P&M-001
		Mastic cooker 1 tonne capacity	hour	6.000	92.70	556.20	P&M-030
		Bitumen boiler 1500 litres capacity	hour	6.000	298.00	1788.00	P&M-005
		Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.000	546.00	546.00	P&M-053
		<b>c) Material</b>					
		Base mastic (without coarse aggregates) = 60 per cent					
		Coarse aggregate (6.3mm to 13.2 mm) = 40 per cent .					
		Proportion of material required for mastic asphalt with coarse aggregates (based on mix design done by CRRI for a specific case)					
		i) Bitumen 85/25 or 30/40 @ 10.2 per cent by weight of mix. $2 \times 10.2/100 = 0.204$	tonne	0.204	34177.50	6972.21	M-197
		ii) Fine aggregate passing 2.36mm and retained on 0.075mm sieve @ 31.9 per cent by weight of mix = $2 \times 31.9/100 = 0.638$ tonnes = $0.638/1.625 = 0.39$	cum	0.390	97.14	37.88	M-021
		iii) Lime stone dust filler with calcium content not less than 80 per cent by weight @ 17.92 per cent by weight of mix = $2 \times 17.92/100 = 0.36$	tonne	0.360	3555.38	1279.94	M-188
		iv) Coarse aggregates 6.3 mm to 13.2 mm @ 40 per cent by weight of mix = $2 \times 40/100 = 0.8$ MT = $0.8/1.456 = 0.55$	cum	0.550	614.17	337.79	M-043
		v) Pre-coated stone chips of 13.2 mm nominal size for skid resistance = $35 \times 0.005/10 = 0.018$	cum	0.018	590.02	10.62	M-142
		vi) Bitumen for coating of chips @ 2 per cent by weight = $0.018 \times 1.456 \times 2/100 = 0.0005$ MT = 0.5kg	kg	0.500	34.18	17.09	M-197
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				877.35	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1549.99	
		Cost for 35.00 sqm = a+b+c+d+e				17049.92	
		<b>Rate per sqm = (a+b+c+d+e)/35</b>				487.14	
					<b>say</b>	<b>487.00</b>	
		<b>Note</b>					
		1.The rates for 50 mm & 40 mm thick layers may be worked out on pro-rata basis.					
		2.Where tack coat is required to be provided before laying mastic asphalt, the same is required to be measured and paid separately.					
		3.The quantities of binder, filler and aggregates are for estimating purpose. Exact quantities shall be as per mix design.					
5.15	516	<b>Slurry Seal</b>					
		Providing and laying slurry seal consisting of a mixture of fine aggregates, portland cement filler, bituminous emulsion and water on a road surface including cleaning of surface, mixing of slurry seal in a suitable mobile plant, laying and compacting to provide even riding surface.					
		<b>Case (i) 5 mm thickness</b>					
		<b>Unit = sqm</b>					
		<b>Taking output = 16000 sqm (80 cum)</b>					
		<b>Taking density of 2.2 tonnes per cum</b>					
		weight of mix = 176 tonnes					
		<b>a) Labour</b>					
		Mate	day	0.240	272.00	65.28	L-12
		Mazdoor	day	6.000	257.00	1542.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom	hour	6.000	555.00	3330.00	P&M-031



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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Air compressor 250 cfm	hour	6.000	481.00	2886.00	P&M-001
		Mobile slurry seal equipment	hour	6.000	1516.00	9096.00	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler.	hour	6.000	1018.00	6108.00	P&M-048
		Pneumatic tyred roller with individual wheel load not exceeding 1.5 tonnes	hour	6.000	1872.00	11232.00	P&M-037
		Water tanker 6 KL capacity	hour	2.000	183.00	366.00	P&M-060
		<b>c) Material</b>					
		Residual Binder @ 11 per cent of mix 80 x 2.2 x 0.11	tonne	19.360	39475.00	764236.00	M-077
		Fine aggregate 4.75 mm and below 87 per cent of total mix, 80 x 2.2 x 0.87 = 153.12 tonnes. Taking density 1.5, = 153.12/1.5 = 102.08 cum	cum	102.080	200.45	20461.94	M-030
		Filler @ 2 per cent of total mix = 80 x 2.2 x 0.02	tonne	3.520	3555.38	12514.94	M-188
		Cost of water	KL	12.000	253.69	3044.28	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				50587.23	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				89370.77	
		Cost for 16000 sqm = a+b+c+d+e				983078.43	
		<b>Rate per sqm = (a+b+c+d+e)/16000</b>				61.44	
					<b>say</b>	<b>61.00</b>	
5.15	Case (ii)	<b>3 mm thickness</b>					
		<i>Unit = sqm</i>					
		<i>Taking output = 20000 sqm (60 cum)</i>					
		<b>a) Labour</b>					
		Mate	day	0.200	272.00	54.40	L-12
		Mazdoor	day	5.000	257.00	1285.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom	hour	6.000	555.00	3330.00	P&M-031
		Air compressor 250 cfm	hour	6.000	481.00	2886.00	P&M-001
		Mobile slurry seal equipment	hour	6.000	1516.00	9096.00	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler	hour	6.000	1018.00	6108.00	P&M-048
		Water tanker 6 KL capacity	hour	2.000	183.00	366.00	P&M-060
		<b>c) Material</b>					
		Residual Binder @ 13 per cent of mix = 60 x 2.2 x 0.13	tonne	17.160	39475.00	677391.00	M-077
		Fine aggregate 3 mm and below 85 per cent of total mix, 60x 2.2 x 0.85 = 112.2 tonnes. Taking density 1.5,	cum	74.800	185.94	13908.31	M-022
		Filler @ 2 per cent of total mix = 60x 2.2 x 0.02	tonne	2.640	3555.38	9386.20	M-188
		Cost of water	KL	12.000	253.69	3044.28	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				44105.59	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				77919.88	
		Cost for 20000 sqm = a+b+c+d+e				857118.67	
		<b>Rate per sqm = (a+b+c+d+e)/20000</b>				42.86	
					<b>say</b>	<b>43.00</b>	
5.15	Case (iii)	<b>1.5 mm thickness</b>					
		<i>Unit = sqm</i>					
		<i>Taking output = 24000 sqm (36 cum)</i>					
		<b>a) Labour</b>					
		Mate	day	0.200	272.00	54.40	L-12

*Calc.*  
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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mazdoor	day	5.000	257.00	1285.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom	hour	6.000	555.00	3330.00	P&M-031
		Air compressor 250 cfm	hour	6.000	481.00	2886.00	P&M-001
		Mobile slurry seal equipment	hour	6.000	1516.00	9096.00	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 5.5 cum capacity for carriage of aggregate from stockpile on road side to slurry equipment, bitumen emulsion and filler.	hour	6.000	1018.00	6108.00	P&M-048
		Water tanker 6 KL capacity	hour	2.000	183.00	366.00	P&M-060
		<b>c) Material</b>					
		Residual Binder @ 16 per cent of mix, 36 x 2.2 x 0.16	tonne	12.670	39475.00	500148.25	M-077
		Fine aggregate 2.36 mm and below, 82 per cent of total mix, 36 x 2.2 x 0.82 = 64.94 tonnes. Taking density 1.5	cum	43.300	185.94	8051.20	M-022
		Filler @ 2 per cent of total mix = 36 x 2.2 x 0.02	tonne	1.580	3555.38	5617.50	M-188
		Cost of water	KL	12.000	253.69	3044.28	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				32893.48	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				58111.81	
		Cost for 24000 sqm = a+b+c+d+e				639229.92	
		<b>Rate per sqm = (a+b+c+d+e)/24000</b>				26.63	
					<b>say</b>	<b>26.60</b>	
		<b>Note</b>					
		1. Tack coat, if required to be provided, before laying slurry seal may be measured and paid separately					
5.16	517	<b>D.B.M.</b>					
		<b>Recycling of Bituminous Pavement with Central Recycling Plant</b>					
		Recycling pavement by cold milling of existing bituminous layers, planning the surface after cold milling, reclaiming excavated material to the extent of 30 per cent of the required quantity, hauling and stockpiling the reclaimed material near the central recycling plant after carrying out necessary checks and evaluation, adding fresh material including rejuvenators as required, mixing in a hot mix plant, transporting and laying at site and compacting to the required grade, level and thickness, all as specified in clause 517.					
		<b>Unit = cum</b>					
		<b>Taking output = 120 cum (276 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	272.00	130.56	L-12
		Mazdoor	day	10.000	257.00	2570.00	L-13
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		<b>b) Machinery</b>					
		Cold milling machine @ 20 cum per hour	hour	6.000	1398.00	8388.00	P&M-069
		Mechanical broom @ 1250 sqm per hour	hour	1.280	555.00	710.40	P&M-031
		Air compressor 250 cfm	hour	1.280	481.00	615.68	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	0.910	1613.00	1467.83	P&M-004
		Hot mix plant 100-120 TPH producing an average of 75 tonnes per hour	hour	3.000	51428.00	154284.00	P&M-021
		Electric generator set 250 KVA	hour	3.000	3691.00	11073.00	P&M-081
		Front end loader 1.00 cum bucket capacity	hour	3.000	1373.00	4119.00	P&M-017
		Tipper 5.5 cum capacity	hour	18.000	1018.00	18324.00	P&M-048
		Smooth wheeled roller 8-10 tonnes	hour	3.00x0.65*	781.00	1522.95	P&M-044
		Vibratory roller 8 tonnes	hour	3.00x0.65*	2029.00	3956.55	P&M-059
		Smooth wheeled tandem roller 6-8 tonnes	hour	3.00x0.65*	1722.00	3357.90	P&M-045
		<b>c) Material</b>					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>i) Bitumen</b>					
		A bitumen content is 4.5 per cent bitumen weight of mix. For reclaimed material, fresh bitumen will be required to the extent of 60 per cent of normal requirement.					
		In a mix of 276 tonnes, 82.8 tonne is reclaimed and balance 193.2 tonne is fresh mix.					
		Bitumen required for reclaimed mix of 82.8 tonne @ 60 per cent = $82.8 \times 0.60 \times 0.045 = 2.24$	tonne	2.2400	32830.00	73539.20	M-074
		Bitumen required for fresh mix of 193.2 tonnes = $193.2 \times 0.045 = 8.694$	tonne	8.649	32830.00	283959.80	M-074
		<b>ii) Aggregates</b>					
		Percentage of mix requiring fresh aggregates - 70 per cent					
		Weight of fresh mix = $276 \times 0.70 = 193.2$ tonne					
		Weight of fresh aggregate in the mix = $193.2 \times 0.96 = 185.47$ tonne					
		<b>Taking average density of 1.5 tonnes/cum, total volume of aggregate = 123.65 cum.</b>					
		Size wise requirement of fresh aggregates					
		37.5 - 25 mm @ 23 per cent	cum	28.440	479.11	13625.89	M-049
		25 - 10 mm @ 15 per cent	cum	18.550	612.59	11363.54	M-046
		10- 5 mm @ 20 per cent	cum	24.730	528.94	13080.69	M-040
		Below 5 mm @ 40 per cent	cum	49.460	200.45	9914.26	M-030
		Filler (cement) @ 2 per cent = 5.52tonnes of 276 tonne	tonne	5.520	5156.00	28461.12	M-081
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				38706.86	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				68382.12	
		Cost for 120 cum of DBM = a+b+c+d+e				752203.35	
		<b>Rate per cum = (a+b+c+d+e)/120</b>				6268.36	
					say	<b>6268.00</b>	
		<b>Note</b> Although the total rolling time is only 4 hours as per norms, all the three rollers have to be available at site for 3 hours each to match with the output of re-cycling plant. To cater for their idling time, these have been multiplied with a factor of 0.65.					
<b>5.17</b>	<b>518</b>	<b>Fog Spray</b>					
		Providing and applying low viscosity bitumen emulsion for sealing cracks less than 3 mm wide or incipient fretting or disintegration in an existing bituminous surfacing.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	555.00	3330.00	P&M-031
		Air compressor 250 cfm	hour	6.000	481.00	2886.00	P&M-001
		Bitumen emulsion pressure distributor @ 1750 sqm per hour	tonne	6.000	1613.00	9678.00	P&M-004
		<b>c) Material</b>					
		Bitumen emulsion @ 0.75 kg per sqm	tonne	7.880	39475.00	311063.00	M-077
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				19665.64	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				34742.63	
		Cost for 10500 sqm = a+b+c+d+e				382168.91	
		<b>Rate per sqm = (a+b+c+d+e)/10500</b>				36.40	
					say	<b>36.00</b>	
		1.In case it is decided by the engineer to blind the fog spray, the following may be added					
		<b>a) Labour</b>					

*Calc.*  
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		Mate	day	0.160	272.00	43.52	L-12
		Mazdoor for precoating of grit	day	4.000	257.00	1028.00	L-13
		<b>b) Material</b>					
		Crushed stone grit 3 mm size @ 3.75 kg per sqm	cum	26.250	200.45	5261.81	M-024
		Bitumen emulsion for precoating grit @ 2 per cent of grit, 39.38 x 0.02	tonne	0.790	39475.00	31185.25	M-077
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				2251.11	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				3976.97	
		Cost for 10500 sqm = a+b+c+d				43746.67	
		<b>Rate per sqm = (a+b+c+d)/10500</b>				4.17	
					<b>say</b>	<b>4.20</b>	
<b>5.18</b>	<b>519</b>	<b>Bituminous Cold Mix ( Including Gravel Emulsion)</b>					
		Providing, laying and rolling of bituminous cold mix on prepared base consisting of a mixture of unheated mineral aggregate and emulsified or cutback bitumen, including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing to specified grades and levels.					
		<b>Unit = cum</b>					
		<b>Taking output = 205 cum (450 tonne)</b>					
		<b>Case (i) Using bitumen emulsion and 9.5 mm or 13.2 mm size aggregate</b>					
		<b>Composition of mix (450 tonne) is assumed to be as under:-</b>					
		Bitumen Emulsion 8 per cent	By weight of total mix				
		Filler 2 per cent					
		Total aggregates 90 per cent					
		<b>Proportion of aggregates</b>					
		19 mm to 9.5 mm 25 per cent					
		9.5 mm to 6 mm 29 per cent					
		6 mm to 0.075 mm 36 per cent					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor	day	16.000	257.00	4112.00	L-13
		Mazdoor skilled	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Drum mix plant for cold mixes of appropriate capacity but not less than 75 tonnes/hour.	hour	6.000	1812.00	10872.00	P&M-077
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		Paver finisher	hour	6.000	3505.00	21030.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes	hour	6.00x0.65*	1872.00	7300.80	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		<b>c) Material</b>					
		Bitumen emulsion @ 8 per cent	tonne	36.000	39475.00	1421100.00	M-077
		Filler (lime) @ 2 per cent	tonne	9.000	3555.38	31998.42	M-188
		Aggregates size 19 to 9.5 mm - 450 x 0.25 x 1/1.5	cum	75.000	642.67	48200.25	M-045
		Aggregates size 9.5 to 6 mm - 450 x 0.29 x 1/1.5	cum	87.000	528.94	46017.78	M-040
		Aggregates size 6 to 0.075 mm - 450 x 0.36 x 1/1.5	cum	108.000	200.45	21648.60	M-030
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				98957.69	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				174825.25	
		Cost for 205 cum = a+b+c+d+e				1923077.77	

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Rate per cum = (a+b+c+d+e)/205				9380.87	
					say	<u>9381.00</u>	
		(Applicable to cases I to IV)					
	Note	1.Density of aggregates has been assumed 1.5 gms/cc					
		2. Tack coat where provided will be measured and paid separately.					
		*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					
5.18	Case (ii)	Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate					
		Composition of mix (450 tonne) is assumed to be as under:-					
		Bitumen Emulsion 8 per cent					
		Filler 2 per cent					
		Total aggregates 90 per cent					
		Proportion of aggregates					
		37.5 mm to 19 mm 25 per cent					
		19 mm to 6 mm 30 per cent					
		6 mm to 0.075 mm 35 per cent					
		a) Labour					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor	day	16.000	257.00	4112.00	L-13
		Mazdoor skilled	day	5.000	325.00	1625.00	L-15
		b) Machinery					
		Drum mix plant for cold mixes 60-90 tonne per hour producing average output of 75 tonnes per hour	hour	6.000	1812.00	10872.00	P&M-077
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		Paver finisher	hour	6.000	3505.00	21030.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes	hour	6.00x0.65*	1872.00	7300.80	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		c) Material					
		Bitumen emulsion @ 8 per cent	tonne	36.000	39475.00	1421100.00	M-077
		Filler (lime)@ 2 per cent	tonne	9.000	3555.38	31998.42	M-188
		Aggregates size 37.5 to 19 mm - 450 x 0.25 x 1/1.5	cum	75.000	479.11	35933.25	M-048
		Aggregates size 19 to 6 mm - 450 x 0.3 x 1/1.5	cum	90.000	528.14	47532.60	M-047
		Aggregates size 6 to 0.075 mm - 450 x 0.35 x 1/1.5	cum	105.000	200.45	21047.25	M-030
		d) Overhead charges @ 0.06 on (a+b+c)				98276.48	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				173621.78	
		Cost for 205 cum = a+b+c+d+e				1909839.56	
		Rate per cum = (a+b+c+d+e)/205				9316.29	
					say	<u>9316.00</u>	
	Note	1.Density of aggregates has been assumed 1.5 gms/cc					
		2. Tack coat where provided will be measured and paid separately.					

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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					
5.18		<b>Case (iii) Using cutback bitumen and 9.5 mm or 13.2 mm nominal size aggregate</b>					
		<b>Composition of mix</b> (450 tonne) is assumed to be as under:-					
		Cutback bitumen 5 per cent					
		Filler (lime) 2 per cent					
		Total aggregates 93 per cent					
		<b>Proportion of aggregates</b>					
		19 mm to 9.5 mm 26 per cent					
		9.5 mm to 6 mm 31 per cent					
		6 mm to 0.075 mm 36 per cent					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor	day	16.000	257.00	4112.00	L-13
		Mazdoor skilled	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Drum mix plant for cold mixes 60-90 tonne per hour producing average output of 75 tonnes per hour	hour	6.000	1812.00	10872.00	P&M-077
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		Paver finisher	hour	6.000	3505.00	21030.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes	hour	6.00x0.65*	1872.00	7300.80	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		<b>c) Material</b>					
		Cutback bitumen @ 5 per cent	tonne	22.500	32830.00	738675.00	M-076
		Filler (lime)@ 2 per cent	tonne	9.000	3555.38	31998.42	M-188
		Aggregates size 19 to 9.5 mm - 450 x 0.26 x 1/1.5	cum	78.000	642.67	50128.26	M-045
		Aggregates size 9.5 to 6 mm - 450 x 0.31 x 1/1.5	cum	93.000	528.94	49191.42	M-040
		Aggregates size 6 to 0.075 mm - 450 x 0.36 x 1/1.5	cum	108.000	200.45	21648.60	M-030
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				58318.29	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				103028.98	
		Cost for 205 cum = a+b+c+d+e				1133318.75	
		<b>Rate per cum = (a+b+c+d+e)/205</b>				5528.38	
					<b>say</b>	<b>5528.00</b>	
		<b>Note</b>					
		1.Density of aggregates has been assumed 1.5 gms/cc					
		2. Tack coat where provided will be measured and paid separately.					
		*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					
5.18		<b>Case (iv) Using cutback bitumen and 19 mm or 26.5 mm nominal size aggregate</b>					
		<b>Composition of mix</b> (450 tonne) is assumed to be as under:-					
		Cutback bitumen 5 per cent					

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Filler 2 per cent					
		Total aggregates 93 per cent					
		<b>Proportion of aggregates</b>					
		37.5 mm to 19 mm 25 per cent					
		19 mm to 6 mm 30 per cent					
		6 mm to 0.075 mm 38 per cent					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor	day	16.000	257.00	4112.00	L-13
		Mazdoor skilled	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Drum mix plant for cold mixes 60-90 tonne per hour producing output of 75 tonnes per hour	hour	6.000	1812.00	10872.00	P&M-077
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead = 1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		Paver finisher	hour	6.000	3505.00	21030.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1872.00	7300.80	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		<b>c) Material</b>					
		Cutback bitumen on @ 5 per cent	tonne	22.500	32830.00	738675.00	M-076
		Filler (lime) @ 2 per cent	tonne	9.000	3555.38	31998.42	M-188
		Aggregates size 37.5 to 19 mm - 450 x 0.25 x 1/1.5	cum	75.000	479.11	35933.25	M-048
		Aggregates size 19 to 6 mm - 450 x 0.3 x 1/1.5	cum	90.000	528.14	47532.60	M-047
		Aggregates size 6 to 0.075 mm - 450 x 0.38 x 1/1.5	cum	114.000	200.45	22851.30	M-030
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				57439.22	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				101475.96	
		Cost for 205 cum = a+b+c+d+e				1116235.53	
		<b>Rate per cum = (a+b+c+d+e)/205</b>				5445.05	
					<b>say</b>	<b>5445.00</b>	
	<b>Note</b>	1. Density of aggregates has been assumed 1.5 gms/cc					
		2. Tack coat where provided will be measured and paid separately.					
		*3. Though the rollers are required only for 3.5 hours each as per norms of output, but these are required to be available at site for 6 hours as the drum mix plant and the paver would take 6 hours for mixing and paving. To cater for the idle period, their usage rates have been multiplied by a factor of 0.65					
<b>5.19</b>	<b>520</b>	<b>Sand Asphalt Base Course</b>					
		Providing, laying and rolling sand-asphalt base course composed of sand, mineral filler and bituminous binder on a prepared sub-grade or sub-base to the lines, levels, grades and cross sections as per the drawings including mixing in a plant of suitable type and capacity, transporting, laying, compacting and finishing.					
		<b>Unit = cum</b>					
		<b>Taking output = 205 cum (450 tonne)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor	day	16.000	257.00	4112.00	L-13
		Mazdoor skilled	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					

*Calc.*  
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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Hot Mix Plant of appropriate capacity but not less than 75 tonnes/hour	hour	6.000	32919.00	197514.00	P&M-023
		Electric generator set 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		Paver finisher	hour	6.000	3505.00	21030.00	P&M-034
		smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65	781.00	3045.90	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65	2029.00	7913.10	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem rollers.	hour	6.00x0.65	1722.00	6715.80	P&M-045
		<b>c) Material</b>					
		<b>Composition of mix (450 tonne) is assumed to be as under:-</b>					
		Density 2.20 tonne per cum					
		Weight 450 tonne					
		Bitumen 5 per cent					
		Filler 2 per cent					
		Sand of size 4.75 to 0.075 mm 93 per cent					
		Bitumen @ 5 per cent	tonne	22.500	32830.00	738675.00	M-074
		Filler (lime) @ 2 per cent	tonne	9.000	3555.38	31998.42	M-188
		Sand of size 4.75 to 0.075 mm - 450 x 0.93 x 1/1.5	cum	288.620	150.80	43523.90	M-004
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				65469.08	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				115662.04	
		Cost for 205 cum = a+b+c+d+e				1272282.41	
		<b>Rate per cum = (a+b+c+d+e)/205</b>				6206.26	
					<b>say</b>	<b>6206.00</b>	
		<b>Note</b>					
		1. Tack coat will be measured and paid separately					
		2. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of this roller, their usage rates has been multiplied by a factor of 0.65					
<b>5.20</b>	<b>521</b>	<b>Modified Binder</b>					
		Supply of modified binder produced by mixing bitumen with modifier such as natural rubber or crumb rubber or any other polymer found compatible with bitumen and which allows properties given in clause 521.3 and IRC:SP: 53 blending of modifier with bitumen to be done either at the refinery or at central unit with all facilities by proper industrial process, is essential.					
		<b>Unit = tonne</b>					
		The use of modified binder is expected to result in an extended service life of bituminous pavements subject to heavy traffic loads in extreme climatic conditions, thus justifying the entire cost of adding modifiers/fibres. Other advantages include lower temperature susceptibility, higher resistance to aging, higher fatigue life, higher resistance to cracking and better adhesion between aggregates and binder.					
		Detailed information and inductive dose level on the use of polymer modified binder is available in IRC : SP-53 / 2002. A number of proprietary products are now available in the market. For such proprietary products, test reports and cost effectiveness should be the basis for their selection in road works.					



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**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		The modifier, in the required quantity shall be blended at the refinery or at central unit with all facilities by proper industrial process, is essential. If supplied in drums it shall be agitated in melted condition with suitable device for achieving homogeneity.					
		Proposals to use glass fibre, polypropylene fibres or any other similar material in a bituminous mixture should be substantiated, complete with all details including test results, manufacturer's recommendations for addition or means of incorporating the fibres, homogeneously, without segregation, into the mixture.					
		Before agreeing to the use of a fibre, it should have been proved to be satisfactory in use under circumstances, similar to the work, elsewhere or it would have under gone appropriate performance trials. Documented evidence of use and trials of the fibre, in any country having conditions similar to Indian will be acceptable.					
		where information on use of trials is inadequate or lacking, trials may be required to be under taken before agreeing to the use of the fibre.					
		<b>Note</b> 1. The modified binder is usually manufactured by specialised firms as a proprietary product. The rate for this product is required to be ascertained from the market.					
		2. The specifications for various item of road works using polymer/rubber modified bitumens are same as those for penetration grade bitumen except those for any special conditions which the manufacturer may indicate.					
		3. The other controls during mixing, laying shall be same as specified in IRC - 14, 29, 94 and 95 for open graded premix carpet, bituminous concrete, DBM and SDBC respectively.					
		4. The temperature of mixing and rolling will be slightly higher than conventional bituminous mixes as indicated in Table 8 of IRC: SP: 53 - 2002.					
5.21	522	<b>Crack Prevention Courses</b>					
		<b>Case (i) Stress absorbing membrane (SAM) crack width less than 6 mm</b>					
		Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width below 6 mm after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 9 kg per 10 sqm and spreading 5.6 mm crushed stone aggregates @ 0.11 cum per 10 sqm with hydraulic chip spreader, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	272.00	65.28	L-12
		Mazdoor	day	6.000	257.00	1542.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	555.00	3330.00	P&M-031
		Air compressor 250 cfm	hour	6.000	481.00	2886.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1613.00	9678.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	3964.00	23784.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		Modified binder	tonne	9.450	34920.00	329994.00	M-078
		Crushed stone aggregates 5.6 mm size	cum	105.000	408.74	42917.70	M-050
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				25132.98	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				44401.60	

*Calc.*  
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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Cost for 10500 sqm = a+b+c+d+e				488417.55	
		Rate per sqm = (a+b+c+d+e)/10500				46.52	
					say	<u>47.00</u>	
5.21		Case (ii) Stress absorbing membrane (SAM) with crack width 6 mm to 9 mm					
		Providing and laying of a stress absorbing membrane over a cracked road surface, with crack width 6 to 9 mm after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 11 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902					
		Unit = sqm					
		Taking output = 10500 sqm					
		a) Labour					
		Mate	day	0.240	272.00	65.28	L-12
		Mazdoor	day	6.000	257.00	1542.00	L-13
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	555.00	3330.00	P&M-031
		Air compressor 250 cfm capacity	hour	6.000	481.00	2886.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1613.00	9678.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	3964.00	23784.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	781.00	4686.00	P&M-044
		c) Material					
		Modified binder	tonne	11.550	34920.00	403326.00	M-078
		Crushed stone chipping 11.2 mm size	cum	105.000	614.17	64487.85	M-051
		d) Overhead charges @ 0.06 on (a+b+c)				30827.11	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				54461.22	
		Cost for 10500 sqm = a+b+c+d+e				599073.46	
		Rate per sqm = (a+b+c+d+e)/10500				57.05	
					say	<u>57.00</u>	
5.21		Case (iii) Stress absorbing membrane (SAM) crack width above 9 mm and cracked area above 50 per cent					
		Providing and laying a single coat of a stress absorbing membrane over a cracked road surface, with crack width above 9 mm and cracked area above 50 per cent after cleaning with a mechanical broom, using modified binder complying with clause 521, sprayed at the rate of 15 kg per 10 sqm and spreading 11.2 mm crushed stone aggregates @ 0.12 cum per 10 sqm, sweeping the surface for uniform spread of aggregates and surface finished to conform to clause 902					
		Unit = sqm					
		Taking output = 10500 sqm					
		a) Labour					
		Mate	day	0.240	272.00	65.28	L-12
		Mazdoor	day	6.000	257.00	1542.00	L-13
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	555.00	3330.00	P&M-031
		Air compressor 250 cfm capacity	hour	6.000	481.00	2886.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1613.00	9678.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	3964.00	23784.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	781.00	4686.00	P&M-044
		c) Material					
		Modified binder	tonne	15.750	34920.00	549990.00	M-078

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Crushed stone aggregates 11.2 mm size	cum	126.000	614.17	77385.42	M-051
		d) Overhead charges @ 0.06 on (a+b+c)				40439.80	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				71443.65	
		Cost for 10500 sqm = a+b+c+d+e				785880.15	
		Rate per sqm = (a+b+c+d+e)/10500				74.85	
					say	<u>75.00</u>	
		<b>Note</b> In case 2nd coat is also required to be provided, material provided for the 2nd coat shall be as per table 500-47.					
5.21		<b>Case(iv)</b> <b>Case - IV : Bitumen impregnated geotextile</b>					
		Providing and laying a bitumen impregnated geotextile layer after cleaning the road surface, geotextile conforming to requirements of clause 703.3, laid over a tack coat with 1.05 kg per sqm of paving grade bitumen 80 - 100 penetration and constructed to the requirement of clause 703.4.5					
		<b>Unit = sqm</b>					
		<b>Taking output = 3500 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.560	272.00	152.32	L-12
		Mazdoor	day	12.000	257.00	3084.00	L-13
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	2.800	555.00	1554.00	P&M-031
		Air compressor 250 cfm capacity	hour	2.800	481.00	1346.80	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	tonne	2.000	1613.00	3226.00	P&M-004
		Pneumatic roller	hour	2.000	1872.00	3744.00	P&M-037
		<b>c) Material</b>					
		Paving grade bitumen of 80 - 100 penetration @ 1.05 kg per sqm	tonne	3.680	32030.00	117870.40	M-075
		Geotextile including 10 per cent for overlaps	sqm	3850.000	79.47	305959.50	M-108
		d) Overhead charges @ 0.06 on (a+b+c)				26255.22	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				46384.22	
		Cost for 3500 sqm = a+b+c+d+e				510226.47	
		Rate per sqm = (a+b+c+d+e)/3500				145.78	
					say	<u>146.00</u>	
		<b>NOTE</b> As bitumen overlay construction shall follow closely the fabric placement on the same day, an output of 3500 sqm only has been considered for the analysis which will cover a length of 500 m, of 7 m wide carriageway. This can be conveniently overlaid by a bituminous course in a day.					
5.22	519.3	<b>Recipe Cold Mix</b>					
		Providing and laying of premix of crushed stone aggregates and emulsion binder, mixed in a batch type cold mixing plant, laid over prepared surface, by paver finisher, rolled with a pneumatic tyred roller initially and finished with a smooth steel wheel roller, all as per clause 519.3					
		<b>Unit = cum</b>					
		<b>Taking output = 205 cum (450 tonnes)</b>					
		<b>Case(i)</b> <b>75 mm thickness</b>					
		<b>a) Labour</b>					
		Mate	day	1.000	272.00	272.00	L-12
		Mazdoor	day	12.000	257.00	3084.00	L-13
		Mazdoor skilled	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	3730.00	22380.00	P&M-064
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018

*Calc.*  
12/8/19

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Front end loader 1 cum capacity	hour	6.000	1373.00	8238.00	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	3505.00	21030.00	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1872.00	7300.80	P&M-037
		Smooth wheeled steel roller 6-8 tonnes.	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Water tanker 6 KL capacity	hour	1.000	183.00	183.00	P&M-060
		<b>c) Material</b>					
		Bitumen emulsion @ 45 litres per tonne	tonne	20.250	39475.00	799368.75	M-077
		Crushed stone aggregates 40 mm nominal size	cum	297.000	441.08	131000.76	M-055
		Cost of water	KL	6.000	253.69	1522.14	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				61155.48	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				108041.35	
		Cost for 205 sqm = a+b+c+d+e				1188454.89	
		<b>Rate per sqm = (a+b+c+d+e)/205</b>				5797.34	
					<b>say</b>	<b>5797.00</b>	
		<b>Note (Case I to III)</b>					
		1. These mixes are considered suitable for minor repair work and temporary road surface improvement.					
		2. In case concrete mixtures are required to be used for mixing, a number of these will be needed to match the capacity of road rollers.					
		3. Tack coat, where provided, will be measured and paid separately.					
		*4. Both the rollers have to be available at site to match with the output of batch mixing plant and paver finisher. A multiplying factor of 0.65 has been adopted to cater for the idling period of road rollers.					
5.22	Case(ii)	<b>40 mm thickness</b>					
		<b>a) Labour</b>					
		Mate	day	1.000	272.00	272.00	L-12
		Mazdoor	day	12.000	257.00	3084.00	L-13
		Mazdoor skilled	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	3730.00	22380.00	P&M-064
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1373.00	8238.00	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	3505.00	21030.00	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1872.00	7300.80	P&M-037
		Smooth wheeled steel roller 6-8 tonnes.	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Water tanker 6 KL capacity	hour	1.000	183.00	183.00	P&M-060
		<b>c) Material</b>					
		Bitumen emulsion @ 70 litres per tonne	tonne	31.500	39475.00	1243462.50	M-077
		Crushed stone aggregates 14 mm nominal size	cum	287.000	642.67	184446.29	M-052
		Cost of water	KL	6.000	253.69	1522.14	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				91007.84	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				160780.52	
		Cost for 205 sqm = a+b+c+d+e				1768585.69	

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS)**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Rate per sqm = (a+b+c+d+e)/205				8627.25	
					say	<u>8627.00</u>	
5.22	Case(iii)	25 mm thickness					
		a) Labour					
		Mate	day	1.000	272.00	272.00	L-12
		Mazdoor	day	12.000	257.00	3084.00	L-13
		Mazdoor skilled	day	5.000	325.00	1625.00	L-15
		b) Machinery					
		Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	3730.00	22380.00	P&M-064
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1373.00	8238.00	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	3505.00	21030.00	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				398.70	
		P	hour	6.00x0.65*	1872.00	7300.80	P&M-037
		Smooth wheeled steel roller	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Water tanker 6 KL capacity	hour	1.000	183.00	183.00	P&M-060
		c) Material					
		Bitumen emulsion @ 85 litres per tonne	tonne	38.250	39475.00	1509918.75	M-077
		Crushed stone aggregates 6 mm nominal size	cum	270.000	408.74	110359.80	M-050
		Cost of water	KL	6.000	253.69	1522.14	M-189
		d) Overhead charges @ 0.06 on (a+b+c)				102550.03	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				181171.71	
		Cost for 205 sqm = a+b+c+d+e				1992888.83	
		Rate per sqm = (a+b+c+d+e)/205				9721.41	
					say	<u>9721.00</u>	

Calc.  
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## **CHAPTER-5A**

# **BASES AND SURFACE (BITUMINOUS) (WITH MECHANICAL PAVER)**

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Summary of Rate Analysis  
**CHAPTER - 5A**  
**BASES AND SURFACE COURSES (BITUMINOUS)**  
**(With Mechanical Paver)**

Item No.	Description	Unit	Rate (₹)
<b>5.3A</b>	<b>Bituminous Macadam</b> (Providing and laying bituminous macadam with 100-120 TPH hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with mechanical control paver finisher to the required grade, level and alignment and rolled as per clauses 501.6 and 501.7 to achieve the desired compaction.)		
(i)	<b>for Grading I (40 mm nominal size)</b>	cum	5341.00
(ii)	<b>for Grading II (19 mm nominal size)</b>	cum	5319.00
<b>5.6A</b>	<b>Dense Graded Bituminous Macadam</b> (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with mechanical control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.)		
(i)	<b>for Grading I ( 40 mm nominal size)</b>	cum	6382.00
(ii)	<b>for Grading II ( 19 mm nominal size)</b>	cum	6448.00
<b>5.7A</b>	<b>Semi - Dense Bituminous Concrete</b> (Providing and laying semi dense bituminous concrete with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.5 to 5 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with mechanical control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 508 complete in all respects.)		
(i)	<b>for Grading I ( 13 mm nominal size )</b>	cum	6662.00
(ii)	<b>for Grading II ( 10 mm nominal size)</b>	cum	7055.00
<b>5.8A</b>	<b>Bituminous Concrete</b> (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with mechanical control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects.)		
(i)	<b>for Grading-I ( 13 mm nominal size )</b>	cum	7278.00
(ii)	<b>for Grading-II ( 10 mm nominal size)</b>	cum	7251.00
<b>5.10A</b>	<b>Open - Graded Premix Surfacing</b> (Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen or cut-back or emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 tonne capacity, finished to required level and grades.)		
(i)	<b>Case - I: Mechanical method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour</b>	sqm	109.00
(ii)	<b>Case - II: Open-Graded Premix Surfacing using cationic Bitumen Emulsion</b>	sqm	128.00
<b>5.11A</b>	<b>Close Graded Premix Surfacing/Mixed Seal Surfacing</b> (Mechanical means using HMP of appropriate capacity not less than 75 tonnes/hour. Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-a) or 13.2 mm to 0.09 mm (Type-b) aggregates using penetration grade bitumen to the required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade.)		
	<b>i) For Type A</b>	sqm	128.00
	<b>i) For Type B</b>	sqm	120.00
<b>5.12A</b>	<b>Seal Coat</b> (Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A and B seal coats.)		
(i)	<b>Case - I : Type A</b>	sqm	48.00
(ii)	<b>Case - II : Type B</b> (Providing and laying of premix sand seal coat with HMP of appropriate capacity not less than 75 tonnes/ hours using crushed stone chipping 6.7 mm size and penetration bitumen of suitable grade.)	sqm	43.00
<b>5.22A</b>	<b>Recipe Cold Mix</b> (Providing and laying of premix of crushed stone aggregates and emulsion binder, mixed in a batch type cold mixing plant, laid over prepared surface, by paver finisher, rolled with a pneumatic tyred roller initially and finished with a smooth steel wheel roller, all as per clause 519.3.)		
(i)	<b>75 mm thickness</b>	cum	5725.00
(ii)	<b>40 mm thickness</b>	cum	8555.00
(iii)	<b>25 mm thickness</b>	cum	9649.00

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Summary of Rate Analysis

CHAPTER - 5A

**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
5.3A	504	<b>Bituminous Macadam</b>					
		Providing and laying bituminous macadam with 100-120 TPH hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading premixed with bituminous binder, transported to site, laid over a previously prepared surface with mechanical control paver finisher to the required grade, level and alignment and rolled as per clauses 501.6 and 501.7 to achieve the desired compaction.					
		<b>Unit = cum</b>					
		<b>Taking output = 205 cum (450 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	257.00	4112.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP 100-120 TPH @ 75 tonne per hour actual output	hour	6.000	39088.00	234528.00	P&M-022
		Mechanical broom hydraulic @ 1250 sqm per hour	hour	2.200	555.00	1221.00	P&M-031
		Air compressor 250 cfm	hour	2.200	481.00	1058.20	P&M-001
		Paver finisher hydrostatic with mechanical control @ 75 cum per hour	hour	6.000	1390.00	8340.00	P&M-035
		Generator 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				398.70	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling	hour	6.00x0.65*	2029.00	7913.10	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		<b>c) Material</b>					
		i) Bitumen @ 3.3 per cent of mix	tonne	14.850	32830.00	487525.50	M-074
		weight of mix = 205 x 2.2 = 450 tonne					
		ii) Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 14.85 tonnes					
		Weight of aggregate = 450 -14.85 = 435.15 tonnes					
		<b>Taking density of aggregate = 1.5 ton/cum</b>					
		Volume of aggregate = 290.1 cum					
		<b>*Grading I (40 mm nominal size )</b>					
		37.5 - 25 mm 15 per cent	cum	43.510	479.11	20846.08	M-049
		25 - 10 mm 45 per cent	cum	130.550	612.59	79973.62	M-046
		10 - 5 mm 25 per cent	cum	72.530	528.94	38364.02	M-040
		5 mm and below 15 per cent	cum	43.510	200.45	8721.58	M-030
		<b>or</b>					
		<b>Grading II (19 mm nominal size)</b>					
		25 - 10 mm 40 per cent	cum	116.040	612.59	71084.94	M-046

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
		10 - 5 mm 40 per cent	cum	116.040	528.94	61378.20	M-040
		5 mm and below 20 per cent	cum	58.020	200.45	11630.11	M-030
		* Any one of the alternative may be adopted as per approved design.					
	(i)	<b>For Grading I (40 mm nominal size )</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				56339.28	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				99532.73	
		Cost for 205 cum = a+b+c+d+e				1094859.98	
		Rate per cum = (a+b+c+d+e)/205 (For Grading I)				5340.78	
					say	<b>5341.00</b>	
	(ii)	<b>For Grading II (19 mm nominal size)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				56110.56	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				99128.65	
		Cost for 205 cum = a+b+c+d+e				1090415.13	
		Rate per cum = (a+b+c+d+e)/205 (For Grading II)				5319.10	
					say	<b>5319.00</b>	
	Note	1. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a factor of 0.65.					
		2.Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case BM is laid over freshly laid tack coat, provision of Mechanical broom and 2 mazdoors for the same shall be deleted as the same has been included in the cost of tack coat.					
5.6A	507	<b>Dense Graded Bituminous Macadam</b>					
		Providing and laying dense graded bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 per cent by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with mechanical control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.					
		<b>Unit = cum</b>					
		<b>Taking output = 195 cum (450 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	257.00	4112.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	39088.00	234528.00	P&M-022
		Paver finisher hydrostatic with mechanical control @ 75 cum per hour	hour	6.000	1390.00	8340.00	P&M-035

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12/5/19

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
		Generator 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>398.70</b>	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling	hour	6.00x0.65*	2029.00	7913.10	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		<b>c) Material</b>					
		i) Bitumen @ 4.25 per cent of weight of mix	tonne	19.130	32830.00	628037.90	M-074
		ii) Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 19.13 tonnes					
		Weight of aggregate = 450 -19.13 = 430.87 tonnes					
		<b>Taking density of aggregate = 1.5 ton/cum</b>					
		Volume of aggregate = 287.25 cum					
		<b>*Grading - I (40 mm nominal Size)</b>					
		37.5 - 25 mm 22 per cent	cum	63.190	479.11	30274.96	M-049
		25 - 10 mm 13 per cent	cum	37.340	612.59	22874.11	M-046
		10 -4.75 mm 19 per cent	cum	54.580	528.94	28869.55	M-040
		4.75 mm and below 44 per cent	cum	126.390	200.45	25334.88	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		<b>or</b>					
		<b>Grading - II (19 mm nominal Size)</b>					
		25 - 10 mm 30 per cent	cum	86.160	612.59	52780.75	M-046
		10 - 5 mm 28 per cent	cum	80.430	528.94	42542.64	M-040
		5 mm and below 40 per cent	cum	114.900	200.45	23031.71	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		* Any one of the alternative may be adopted as per approved design.					
	(i)	<b>For Grading I (40 mm nominal size)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				64039.00	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				113135.58	
		Cost for 195 cum = a+b+c+d+e				1244491.33	
		Rate per cum = (a+b+c+d+e)/195 (For Grading I)				6382.01	
					say	<b>6382.00</b>	
	(ii)	<b>For Grading II (19 mm nominal size)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				64699.10	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				114301.75	
		Cost for 195 cum = a+b+c+d+e				1257319.21	
		Rate per cum = (a+b+c+d+e)/195 (For Grading II)				6447.79	
					say	<b>6448.00</b>	

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12/10/19

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
		<b>Note</b>	1. Although the roller are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a factor of 0.65.					
			2. Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
			3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
			4. In case DBM is laid over freshly laid tack coat, provision of mechanical broom and 2 mazdoors shall be deleted as the same has been included in the cost of tack coat.					
			5. The individual density for each size of aggregates to be used for construction i.e. 37.5-25 mm, 25-10 mm etc. should be found in the laboratory and accordingly the quantities should be ammended for use in field. The average density of 1.5 tonne/cum is only a reference density in this Data Book.					
			6. The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e.. excluding the weight of bitumen. The weight of filler will also be 2 per cent by weight of dry aggregates.					
<b>5.7A</b>	<b>508</b>		<b>Semi-Dense Bituminous Concrete</b>					
			Providing and laying semi dense bituminous concrete with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.5 to 5 per cent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with mechanical control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 508 complete in all respects.					
			<b>Unit = cum</b>					
			<b>Taking output = 195 cum (450 tonnes)</b>					
			<b>a) Labour</b>					
			Mate	day	0.840	272.00	228.48	L-12
			Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	257.00	4112.00	L-13
			Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
			<b>b) Machinery</b>					
			Batch mix HMP @ 75 tonne per hour	hour	6.000	39088.00	234528.00	P&M-022
			Paver finisher hydrostatic with mechanical control @ 75 cum per hour	hour	6.000	1390.00	8340.00	P&M-035
			Generator 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
			Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
			Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
			<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>398.70</b>	
			Smooth wheeled roller 8-10 tonnes for initial break down rolling	hour	6.00x0.65*	781.00	3045.90	P&M-044

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
		Vibratory roller 8 tonnes for intermediate rolling	hour	6.00x0.65*	2029.00	7913.10	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		<b>c) Material</b>					
		<b>*Grading I (13 mm nominal Size)</b>					
		i) Bitumen @ 4.5 per cent of weight of mix	tonne	20.250	32830.00	664807.50	M-074
		ii) Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 20.25 tonnes					
		Weight of aggregate = 450-20.25 = 429.75 tonnes					
		Taking density of aggregate = 1.5 ton/cum					
		Volume of aggregate = 286.5 cum					
		13.2 - 10 mm 20 per cent	cum	57.300	642.67	36824.99	M-044
		10 - 5 mm 38 per cent	cum	108.870	528.94	57585.70	M-040
		5 mm and below 40 per cent	cum	114.600	200.45	22971.57	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		<b>or</b>					
		<b>Grading II (10 mm nominal Size)</b>					
		i) Bitumen @ 5 per cent of weight of mix	tonne	22.500	32830.00	738675.00	M-074
		weight of mix = 450 tonnes					
		ii) Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 22.5 tonnes					
		Weight of aggregate = 450 - 22.50 = 427.50 tonnes					
		Taking density of aggregate = 1.5 ton/cum					
		Volume of aggregate = 285 cum					
		9.5 - 4.75 mm @ 57 per cent	cum	162.450	528.94	85926.30	M-040
		4.75 and below @ 41 per cent	cum	116.850	200.45	23422.58	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		*Any one of the alternative may be adopted as per approved design.					
	(i)	<b>for Grading I ( 13 mm nominal size )</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				66846.91	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				118096.20	
		Cost for 195 cum = a+b+c+d+e				1299058.22	
		Rate per cum = (a+b+c+d+e)/195 (For Grading I)				6661.84	
					say	<u>6662.00</u>	
5.7A	(ii)	<b>for Grading II (10 mm nominal size)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				70796.95	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				125074.62	
		Cost for 195 cum = a+b+c+d+e				1375820.82	
		Rate per cum = (a+b+c+d+e)/195 (For Grading II)				7055.49	
					say	<u>7055.00</u>	
	Note	1. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a factor of 0.65.					

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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
		2.Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case SDBC is laid over freshly laid tack coat, provision of broom and 2 mazdoor shall be deleted as the same has been included in the cost of tack coat.					
		5. The quantity of Bitumen to be adjusted as per job mix formula.					
<b>5.8A</b>	<b>509</b>	<b>Bituminous Concrete</b>					
		Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 per cent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paverfinisher with mechanical control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 509 complete in all respects.					
		<b>Unit = cum</b>					
		<b>Taking output = 191 cum (450 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	257.00	4112.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	39088.00	234528.00	P&M-022
		Paver finisher hydrostatic with mechanical control @ 75 cum per hour	hour	6.000	1390.00	8340.00	P&M-035
		Generator 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>398.70</b>	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling	hour	6.00x0.65*	2029.00	7913.10	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller	hour	6.00x0.65*	1722.00	6715.80	P&M-045
		<b>c) Material</b>					
		i) Bitumen @ 5 per cent of weight of mix	tonne	22.500	32830.00	738675.00	M-074
		ii) Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 22.5 tonnes					
		Weight of aggregate = 450 -22.50 = 427.50 tonnes					
		<b>Taking density of aggregate = 1.5 ton/cum</b>					
		Volume of aggregate = 285 cum					
		<b>* Grading I (9 mm nominal Size)</b>					

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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
		20 - 10 mm 35 per cent	cum	99.750	642.67	64106.33	M-045
		10 - 5 mm 23 per cent	cum	65.550	528.94	34672.02	M-040
		5 mm and below 40 per cent	cum	114.000	200.45	22851.30	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		or					
		<b>Grading II (13 mm nominal Size)</b>					
		13.2 - 10 mm 30 per cent	cum	85.500	642.67	54948.29	M-044
		10 - 5 mm 25 per cent	cum	71.250	528.94	37686.98	M-040
		5 mm and below 43 per cent	cum	122.550	200.45	24565.15	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3555.38	30647.38	M-188
		*Any one of the alternative may be adopted as per approved design.					
	(i)	<b>for Grading I ( 13 mm nominal size )</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				71533.80	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				126376.38	
		Cost for 191 cum = a+b+c+d+e				1390140.19	
		Rate per cum = (a+b+c+d+e)/191 (For Grading-I)				7278.22	
					say	<u>7278.00</u>	
5.8A	(ii)	<b>for Grading II (10 mm nominal size)</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				71268.05	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				125906.88	
		Cost for 191 cum = a+b+c+d+e				1384975.69	
		Rate per cum = (a+b+c+d+e)/191 (For Grading-II)				7251.18	
					say	<u>7251.00</u>	
	Note	1. Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 450 tonnes considered in this analysis. To cater for the idle period of these rollers, their usage rates have been multiplied by a factor of 0.65.					
		2.Quantity of Bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		3. Labour for traffic control, watch and ward and other miscellaneous duties at site including sundries have been included in administrative overheads of the contractor.					
		4. In case BC is laid over freshly laid tack coat, provision of mechanical broom and 2 mazdoors shall be deleted as the same has been included in the cost of tack coat.					
		5. The individual density for each size of aggregates to be used for construction i.e. 37.5-25 mm, 25-10 mm etc. should be found in the laboratory and accordingly the quantities should be ammended for use in field. The average density of 1.5 tonne/cum is only a reference density in this Data Book.					
		6. The individual percentage of aggregates should be calculated from the total weight of dry aggregates i.e.. excluding the weight of bitumen. The weight of filler will also be 2 per cent by weight of dry aggregates.					
5.10A	511	<b>Open - Graded Premix Surfacing</b>					

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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
			Providing, laying and rolling of open - graded premix surfacing of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen or cut-back or emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a smooth wheeled roller 8-10 tonne capacity, finished to required level and grades.					
			<b>Unit = sqm</b>					
			<b>Taking output = 10250 sqm (205 cum)</b>					
		(i)	<b>Case - I: Mechanical method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour .</b>					
			<b>a) Labour</b>					
			Mate	day	0.840	272.00	228.48	L-12
			Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	257.00	4112.00	L-13
			Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
			<b>b) Machinery</b>					
			i) Batch type HMP 75 tonne per hour	hour	6.000	39088.00	234528.00	P&M-022
			ii) Electric Generator Set 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
			iii) Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
			iv) Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
			<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>398.70</b>	
			v) Paver finisher hydrostatic with mechanical attachment	hour	6.000	1390.00	8340.00	P&M-035
			iv) Smooth wheeled/tandem roller 8-10 tonnes weight	hour	6.000	1722.00	10332.00	P&M-045
			<b>c) Material</b>					
			Bitumen @ 14.60 kg per 10 sqm	tonne	14.970	32830.00	491465.10	M-074
			Crushed stone chipping, 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	276.750	614.17	169971.55	M-043
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				57322.31	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				101269.41	
			Cost for 10250 sqm = a+b+c+d+e				1113963.55	
			<b>Rate per sqm = (a+b+c+d+e)/10250</b>				108.68	
						<b>say</b>	<b><u>109.00</u></b>	
		<b>Note</b>	If a premix sand seal coat of 'B' type is proposed, the same is required to be provided over the open graded premix carpet immediately on the same day. As the same HMP and other machines will be used for laying of premix sand seal coat, out of 6 effective working hours, 4.00 hours may be utilised for laying of premix carpet and balance 2.00 hours for the seal coat. The rate for the premix sand seal coat under clause 513 (case II) has been worked out accordingly by utilising the HMP for 2.00 hours for the purpose of seal coat. In case type 'A' seal coat is proposed, HMP can be worked for six hours for the premix carpet as type 'A' seal coat does not require the use of HMP.					
5.10A		(ii)	<b>Case - II: Open-Graded Premix Surfacing using cationic Bitumen Emulsion</b>					
			<b>Unit = sqm</b>					
			<b>Taking output = 900 sqm (24.3 cum)</b>					

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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
		<b>a) Labour</b>					
		Mate	day	0.800	272.00	217.60	L-12
		Mazdoor	day	18.000	257.00	4626.00	L-13
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		<b>b) Machinery</b>					
		Concrete mixer 0.4/0.28 cum capacity	hour	6.000	82.30	493.80	P&M-009
		Smooth wheeled steel roller 8-10 tonne	hour	6.000	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		Cationic Bitumen Emulsion @ 21.50 kg per 10 sqm	tonne	1.940	37539.00	72825.66	M-073
		Crushed stone aggregates 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	24.300	614.17	14924.33	M-043
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				5905.40	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				10432.88	
		Cost for 900 sqm = a+b+c+d+e				114761.67	
		<b>Rate per sqm = (a+b+c+d+e)/900</b>				127.51	
					<b>say</b>	<b>128.00</b>	
5.11A	512	<b>Close Graded Premix Surfacing/Mixed Seal Surfacing</b>					
		<b>Case I</b>					
		Mechanical means using HMP of appropriate capacity not less than 75 tonnes/hour.					
		Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-A) or 13.2 mm to 0.09 mm (Type-B) aggregates using penetration grade bitumen to the required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10250 sqm (205 cum)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	257.00	4112.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		i) HMP of appropriate capacity - 75 t per hour	hour	6.000	39088.00	234528.00	P&M-022
		ii) Electric Generator Set 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		iii) Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		iv) Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				398.70	
		v) Paver finisher hydrostatic with mechanical attachment	hour	6.000	1390.00	8340.00	P&M-035
		iv) Smooth wheeled 8-10 tonnes weight	hour	6.000	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		<b>Type - A</b>					
		* Bitumen @ 22 kg per 10 sqm	tonne	22.500	32830.00	738675.00	M-074

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
		Stone crushed aggregates 11.2 mm to 0.09 @ 0.27 cum per 10 sqm	cum	276.750	345.52	95622.66	M-041
		or					
		<b>Type - B</b>					
		Bitumen @ 19 kg per 10 sqm	tonne	19.480	32830.00	639528.40	M-074
		Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	276.750	470.04	130083.57	M-042
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				67355.21	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				118994.21	
		Cost for 10250 sqm = a+b+c+d+e				1308936.26	
		<b>Rate per sqm = (a+b+c+d+e)/10250</b>				127.70	
		<b>For Type 'A'</b>			say	<b>128.00</b>	
		<b>For Type 'B'</b>			say	<b>120.00</b>	Sub_Analysis
		* Any one of the alternative may be adopted					
<b>5.12A</b>	<b>513</b>	<b>Seal Coat</b>					
		Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type A and B seal coats					
		<b>Unit = sqm</b>					
		<b>Taking output = 10250 sqm (92.25 cum)</b>					
		<b>(i) Case - I : Type A</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	272.00	65.28	L-12
		Mazdoor	day	6.000	257.00	1542.00	L-13
		<b>b) Machinery</b>					
		Hydraulic self propelled chip spreader	hour	6.000	3964.00	23784.00	P&M-025
		Tipper 5.5 cum capacity	hour	6.000	1018.00	6108.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1613.00	9678.00	P&M-004
		Smooth wheeled roller 8 -10 tonne weight	hour	6.000	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		Bitumen @ 9.80 kg per 10 sqm	tonne	10.050	32830.00	329941.50	M-074
		Crushed stone chipping of 6.7 mm size defined as 100 per cent passing 11.2 mm sieve and retained on 2.36 mm sieve applied @ 0.09 cum per 10 sqm	cum	92.250	408.74	37706.27	M-050
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				25304.94	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				44705.40	
		Cost for 10250 sqm = a+b+c+d+e				491759.39	
		<b>Rate per sqm = (a+b+c+d+e)/10250</b>				47.98	
					say	<b>48.00</b>	
		<b>Note</b> Since seal coat is provided immediately over the bituminous layers, mechanical broom for clearing has not been catered.					
<b>5.12A</b>		<b>(ii) Case - II : Type B</b>					
		Providing and laying of premix sand seal coat with HMP of appropriate capacity not less than 75 tonnes/ hours using crushed stone chipping 6.7 mm size and penetration bitumen of suitable grade.					
		<b>Unit = sqm</b>					
		<b>Taking output = 7858 sqm (47.16 cum)</b>					

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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
		<b>a) Labour</b>					
		Mate	day	0.160	272.00	43.52	L-12
		Mazdoor	day	4.000	257.00	1028.00	L-13
		<b>b) Machinery</b>					
		HMP of 75 tonnes/hour.	hour	2.000	39088.00	78176.00	P&M-022
		Electric Generator Set 250 KVA	hour	2.000	3691.00	7382.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	2.000	1373.00	2746.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	104 x 'L'	8.86	921.44	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>92.14</b>	
		Paver finisher hydrostatic with mechanical attachment	hour	2.000	1390.00	2780.00	P&M-035
		Smooth wheeled 8-10 tonnes capacity	hour	2.000	781.00	1562.00	P&M-044
		<b>c) Material</b>					
		Bitumen @ 6.80 kg per 10 sqm	tonne	5.340	32830.00	175312.20	M-074
		Crushed stone chipping of 6.7 mm size defined as passing 11.2 mm sieve and retained on 2.36 mm sieve applied @ 0.06 cum per 10 sqm	cum	47.160	408.74	19276.18	M-050
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				17359.17	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				30667.87	
		Cost for 7858 sqm = a+b+c+d+e				337346.52	
		<b>Rate per sqm = (a+b+c+d+e)/7858</b>				42.93	
					<b>say</b>	<b>43.00</b>	
		<b>Note</b>					
		Since seal coat is required to be provided over the premix carpet on the same day, out of the 6 working hours of the HMP, 4.00 hours are proposed to be utilised for the premix carpet and the balance 2.00 hours for the seal coat. Hence 2.00 hours have been considered for this case. This may be linked to rate analysis worked out under clause 511.					
<b>5.22A</b>	<b>519.3</b>	<b>Recipe Cold Mix</b>					
		Providing and laying of premix of crushed stone aggregates and emulsion binder, mixed in a batch type cold mixing plant, laid over prepared surface, by paver finisher, rolled with a pneumatic tyred roller initially and finished with a smooth steel wheel roller, all as per clause 519.3					
		<b>Unit = cum</b>					
		<b>Taking output = 205 cum (450 tonnes)</b>					
		<b>Case (I) 75 mm thickness</b>					
		<b>a) Labour</b>					
		Mate	day	1.000	272.00	272.00	L-12
		Mazdoor	day	12.000	257.00	3084.00	L-13
		Mazdoor skilled	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	3730.00	22380.00	P&M-064
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1373.00	8238.00	P&M-017

Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
		Paver finisher hydrostatic with mechanical control @ 75 cum per hour	hour	6.000	1390.00	8340.00	P&M-035
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>398.70</b>	
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1872.00	7300.80	P&M-037
		Smooth wheeled steel roller 6-8 tonnes.	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Water tanker 6 KL capacity	hour	1.000	183.00	183.00	P&M-060
		<b>c) Material</b>					
		Bitumen emulsion @ 45 litres per tonne	tonne	20.250	39475.00	799368.75	M-077
		Crushed stone aggregates 40 mm nominal size	cum	297.000	441.08	131000.76	M-055
		Cost of water	KL	6.000	253.69	1522.14	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				60394.08	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				106696.21	
		Cost for 205 sqm = a+b+c+d+e				1173658.35	
		<b>Rate per sqm = (a+b+c+d+e)/205</b>				5725.16	
					<b>say</b>	<b>5725.00</b>	
		<b>Note (Case I to III)</b>					
		1. These mixes are considered suitable for minor repair work and temporary road surface improvement.					
		2. In case concrete mixtures are required to be used for mixing, a number of these will be needed to match the capacity of road rollers.					
		3. Tack coat, where provided, will be measured and paid separately.					
		*4.Both the rollers have to be available at site to match with the output of batch mixing plant and paver finisher. A multiplying factor of 0.65 has been adopted to cater for the idling period of road rollers.					
<b>5.22A</b>		<b>Case (II) 40 mm thickness</b>					
		<b>a) Labour</b>					
		Mate	day	1.000	272.00	272.00	L-12
		Mazdoor	day	12.000	257.00	3084.00	L-13
		Mazdoor skilled	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	3730.00	22380.00	P&M-064
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1373.00	8238.00	P&M-017
		Paver finisher hydrostatic with mechanical control @ 75 cum per hour	hour	6.000	1390.00	8340.00	P&M-035
		Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>398.70</b>	
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1872.00	7300.80	P&M-037
		Smooth wheeled steel roller 6-8 tonnes.	hour	6.00x0.65*	781.00	3045.90	P&M-044
		Water tanker 6 KL capacity	hour	1.000	183.00	183.00	P&M-060
		<b>c) Material</b>					

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Analysis of Rates  
**BASES AND SURFACE COURSES (BITUMINOUS) (With Mechanical Paver )**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost( ₹)	Remarks/ Input ref.
			Bitumen emulsion @ 70 litres per tonne	tonne	31.500	39475.00	1243462.50	M-077
			Crushed stone aggregates 14 mm nominal size	cum	287.000	642.67	184446.29	M-052
			Cost of water	KL	6.000	253.69	1522.14	M-189
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				90246.44	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				159435.38	
			Cost for 205 sqm = a+b+c+d+e				1753789.15	
			<b>Rate per sqm = (a+b+c+d+e)/205</b>				8555.07	
						<b>say</b>	<b>8555.00</b>	
<b>5.22A</b>		<b>Case (III)</b>	<b>25 mm thickness</b>					
			<b>a) Labour</b>					
			Mate	day	1.000	272.00	272.00	L-12
			Mazdoor	day	12.000	257.00	3084.00	L-13
			Mazdoor skilled	day	5.000	325.00	1625.00	L-15
			<b>b) Machinery</b>					
			Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour	hour	6.000	3730.00	22380.00	P&M-064
			Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
			Front end loader 1 cum capacity	hour	6.000	1373.00	8238.00	P&M-017
			Paver finisher hydrostatic with mechanical control @ 75 cum per hour	hour	6.000	1390.00	8340.00	P&M-035
			Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead =1 km & P&M-047
			<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>398.70</b>	
			Pneumatic tyred roller	hour	6.00x0.65*	1872.00	7300.80	P&M-037
			Smooth wheeled steel roller	hour	6.00x0.65*	781.00	3045.90	P&M-044
			Water tanker 6 KL capacity	hour	1.000	183.00	183.00	P&M-060
			<b>c) Material</b>					
			Bitumen emulsion @ 85 litres per tonne	tonne	38.250	39475.00	1509918.75	M-077
			Crushed stone aggregates 6 mm nominal size	cum	270.000	408.74	110359.80	M-050
			Cost of water	KL	6.000	253.69	1522.14	M-189
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				101788.63	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				179826.57	
			Cost for 205 sqm = a+b+c+d+e				1978092.29	
			<b>Rate per sqm = (a+b+c+d+e)/205</b>				9649.23	
						<b>say</b>	<b>9649.00</b>	



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## **CHAPTER-5B**

# **BASES AND SURFACE COURSE (BITUMINOUS)**

**(WITH MECHANICAL PAVER AND 40-60 TPH, HMP)**

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Summary of Rate Analysis

CHAPTER - 5B

**BASES AND SURFACE COURSES (BITUMINOUS)**

(With Mechanical Paver and 40-60 TPH , HMP)

	The Analysis of Chapter-5B is As per the Analysis given in MORD (Ministry of Rural Development). All Table and Clause are Referred to MORD SPECIFICATION Book.		
Item No.	Description	Unit	Rate (₹)
<b>5.3B</b>	<b>BITUMINOUS MACADAM</b>		
	Providing and laying bituminous macadam with HMP using crushed aggregates of grading as per Table 500.4 premixed with bituminous binder, transported to site upto a lead of 1000 m laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled to achieve the desired compaction as per Technical Specification Clause 504.		
	(I) BITUMEN (S-90)/(80/100 grade)	cum	5748.00
	(II) BITUMEN (S-65)/(60/70 grade)	cum	5816.00
<b>5.9B</b>	<b>20 mm thick Open-Graded Premix Carpet using Bituminous (penetration grade/modified bitumen) Binder</b>		
	Providing, laying and rolling of open-graded premix carpet of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen or emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a three wheel 80-100 kN static roller capacity, finished to required level and grades to be followed by seal coat of either Type A or Type B or Type C as per Technical Specification Clause 508.		
(I)	BITUMEN (S-90)/(80/100 grade)	sqm	127.00
(II)	BITUMEN (S-65)/(60/70 grade)	sqm	128.00
<b>5.11B</b>	<b>Mix Seal Surfacing</b>		
	Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.9 mm (Type-A) or 13.2 mm to 0.9 mm (Type-B) aggregates using penetration grade bitumen to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a three wheel 8-10 kN static roller and finishing to required level and grades as per Technical Specification Clause 509.		
<b>TYPE-A</b>	(I) BITUMEN (S-90)/(80/100 grade)	sqm	146.00
	(II) BITUMEN (S-65)/(60/70 grade)	sqm	148.00
<b>TYPE-B</b>	(I) BITUMEN (S-90)/(80/100 grade)	sqm	139.00
	(II) BITUMEN (S-65)/(60/70 grade)	sqm	141.00
<b>5.12B</b>	<b>Seal Coat</b> (Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type B seal coats.)		
	<b>Case - II : Type B</b> (Providing and laying of premix sand seal coat with HMP of appropriate capacity not less than 75 tonnes/ hours using crushed stone chipping 6.7 mm size and penetration bitumen of suitable grade.)		
	(I) BITUMEN (S-90)/(80/100 grade)	sqm	40.40
	(II) BITUMEN (S-65)/(60/70 grade)	sqm	41.00

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Analysis of Rates

CHAPTER - 5B

BASES AND SURFACES COURSES (BITUMINOUS) (With Mechanical Paver and 40-60 TPH, HMP)

Sr. No.	Ref. of MoRD Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
5.3B	504	<b>Bituminous Macadam</b>					
		Providing and laying bituminous macadam with HMP using crushed aggregates of grading as per Table 500.4 premixed with bituminous binder, transported to site upto a lead of 1000 m laid over a previously prepared surface with paver finisher to the required grade, level and alignment and rolled to achieve the desired compaction as per Technical Specification Clause 504.					
		Unit = cum					
	(I)	<b>BITUMEN (80/100grade)</b>					
		Taking output = 102.5 cum (225 t)					
		<b>a) Labour</b>					
		Mate	day	0.52	272.00	141.44	L-12
		Mazdoor (Unskilled)	day	10.00	257.00	2570.00	L-13
		Mazdoor (Skilled)	day	3.00	325.00	975.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP 40-60 THP @ 40 t per hour actual output	hour	6.00	23018.00	138108.00	P&M-024
		Hydraulic broom @ 1250 sqm per hour	hour	1.10	555.00	610.50	P&M-031
		Air compressor 210 cfm	hour	1.10	481.00	529.10	P&M-001
		Paver finisher	hour	6.00	1390.00	8340.00	P&M-035
		Generator 125 KVA	hour	6.00	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.00	1373.00	8238.00	P&M-017
		Tipper 5.5 cum, 10 t capacity	hour	6.00	1018.00	6108.00	P&M-048
		Three wheel 80-100 kN static roller for initial break down rolling, final and finishing rolling	hour	12*0.65	781.00	6091.80	P&M-044
		Vibratory roller 80-100 kN for intermediate rolling	hour	6*0.65	2029.00	7913.10	P&M-059
		<b>c) Material</b>					
		i) Bitumen @ 3.3 per cent of mix (Weight of mix = 102.5 x 2.2 = 225 t)	t	7.425	32030.00	237822.75	M-075
		ii) Aggregate					
		Total weight of mix = 225 t					
		Weight of bitumen = 7.425 t					
		Weight of aggregate = 225 - 7.425 = 217.575 t					
		Taking density of aggregate = 1.5 t/cum					
		Volume of aggregate = 145.05 cum					
		<b>(19 mm nominal size)</b>					
		25 - 10 mm - 40 per cent	cum	58.02	612.59	35542.47	M-046
		10- 5 mm - 40 per cent	cum	58.02	528.94	30689.10	M-040
		5 mm and below - 20 per cent	cum	29.01	200.45	5815.05	M-030
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				30318.98	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				53563.53	
		Cost of 102.5 cum = a+b+c+d+e				589198.8	
		<b>Rate per cum = a+b+c+d+e/102.5</b>				5748.28	
					say	5748.00	
	(II)	<b>BITUMEN(60/70grade)</b>					
		Taking output = 102.5 cum (225 t)					
		<b>a) Labour</b>					
		Mate	day	0.52	272.00	141.44	L-12
		Mazdoor(unskilled)	day	10.00	257.00	2570.00	L-13
		Mazdoor (Skilled)	day	3.00	325.00	975.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP 40-60 THP @ 40 t per hour actual output	hour	6.00	23018.00	138108.00	P&M-024
		Hydraulic broom @ 1250 sqm per hour	hour	1.10	555.00	610.50	P&M-031
		Air compressor 210 cfm	hour	1.10	481.00	529.10	P&M-001
		Paver finisher	hour	6.00	1390.00	8340.00	P&M-035
		Generator 125 KVA	hour	6.00	2637.00	15822.00	P&M-018

# Analysis of Rates

## BASES AND SURFACES COURSES (BITUMINOUS) (With Mechanical Paver and 40-60 TPH, HMP)

Sr. No.	Ref. of MoRD Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Front end loader 1 cum bucket capacity	hour	6.00	1373.00	8238.00	P&M-017
		Tipper 5.5 cum, 10 t capacity	hour	6.00	1018.00	6108.00	P&M-048
		Three wheel 80-100 kN static roller for initial break down rolling, final and finishing rolling	hour	12*0.65	781.00	6091.80	P&M-044
		Vibratory roller 80-100 kN for intermediate rolling	hour	6*0.65	2029.00	7913.10	P&M-059
		<b>c) Material</b>					
		i) Bitumen @ 3.3 per cent of mix (Weight of mix = 102.5 x 2.2 = 225 t)	t	7.425	32830.00	243762.75	M-074
		ii) Aggregate					
		Total weight of mix = 225 t					
		Weight of bitumen = 7.425 t					
		Weight of aggregate = 225 - 7.425 = 217.575 t					
		Taking density of aggregate = 1.5 t/cum					
		Volume of aggregate = 145.05 cum					
		(19mm nominal size )					
		25-10mm -40%	cum	58.02	612.59	35542.47	M-046
		10-5mm -40%	cum	58.02	528.94	30689.10	M-040
		5mm and below -20%	cum	29.01	200.45	5815.05	M-030
		d) Overhead charges @ 0.06 on (a+b+c)				30675.38	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				54193.17	
		Cost of 102.5 cum = a+b+c+d+e				596124.86	
		Rate per cum = a+b+c+d+e/102.5				5815.85	
					say	5816.00	
		Note: Although the rollers are required only for 3 hours as per norms of output, but the same have to be available at site for six hours as the hot mix plant and paver will take six hours for mixing and paving the output of 225 t considered in these analysis. To cater for the idle period of these rollers, their usage rates may be multiplied by a factor of 0.65.					
		Quantity of bitumen has been taken for analysis purpose. The actual quantity will depend upon job mix formula.					
		Labour for traffic control, watch and ward and other miscellaneous duties at site, including sundries have been included in administrative overheads of the contractor.					
		In case BM is laid over freshly laid tack coat, provision of Hydraulic broom and 2 mazdoor for the same shall be detected as the same has been included in the cost of tack coat.					
		Analysis is based on 1000 m lead of mixed material. Cost of additional cartage may be added as per site requirements.					
5.9B	508	<b>20 mm thick Open-Graded Premix Carpet using Bituminous (penetration grade/modified bitumen) Binder</b>					
		Providing, laying and rolling of open-graded premix carpet of 20 mm thickness composed of 13.2 mm to 5.6 mm aggregates either using penetration grade bitumen or emulsion to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a three wheel 80-100 kN static roller capacity, finished to required level and grades to be followed by seal coat of either Type A or Type B or Type C as per Technical Specification Clause 508.					

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Analysis of Rates

**BASES AND SURFACES COURSES (BITUMINOUS) (With Mechanical Paver and 40-60 TPH, HMP)**

Sr. No.	Ref. of MoRD Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Case - II By Mechanical Means</b>					
	(I)	<b>Bitumen (S-90)/(80/100grade)</b>					
		Unit = sqm					
		Taking output = 4000 sqm (80 cum)					
		<b>a) Labour</b>					
		Mate	day	0.52	272.00	141.44	L-12
		Mazdoor (Unskilled)	day	10.00	257.00	2570.00	L-13
		Mazdoor (Skilled)	day	3.00	325.00	975.00	L-15
		<b>b) Machinery</b>					
		HMP 30/40 t per hour	hour	6.00	23018.00	138108.00	P&M-024
		Electric generator set 125 KVA	hour	6.00	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.00	1373.00	8238.00	P&M-017
		Tipper 5.5 10 t capacity	hour	3.64	1018.00	3705.52	P&M-048
		Paver finisher	hour	6.00	1390.00	8340.00	P&M-035
		Three wheel 80-100 kN static roller	hour	6.00	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		Bitumen (S-90) @ 14.60 kg per 10 sqm	t	5.84	32030.00	187055.20	M-075
		Crushed stone chipping, 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	108.00	614.17	66330.36	M-043
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				26158.29	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				46212.98	
		Cost of 4000 sqm = a+b+c+d+e				508342.79	
		<b>Rate per sqm = (a+b+c+d+e)/4000</b>				127.09	
					say	<b>127.00</b>	
	(II)	<b>Bitumen (S-65)/(60/70grade)</b>					
		Unit = sqm					
		Taking output = 4000 sqm (80 cum)					
		<b>a) Labour</b>					
		Mate	day	0.52	272.00	141.44	L-12
		Mazdoor (Unskilled)	day	10.00	257.00	2570.00	L-13
		Mazdoor (Skilled)	day	3.00	325.00	975.00	L-15
		<b>b) Machinery</b>					
		HMP 30/40 t per hour	hour	6.00	23018.00	138108.00	P&M-024
		Electric generator set 125 KVA	hour	6.00	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.00	1373.00	8238.00	P&M-017
		Tipper 5.5 10 t capacity	hour	3.64	1018.00	3705.52	P&M-048
		Paver finisher	hour	6.00	1390.00	8340.00	P&M-035
		Three wheel 80-100 kN static roller	hour	6.00	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		Bitumen (S-65) @ 14.60 kg per 10 sqm	t	5.84	32830.00	191727.20	M-074
		Crushed stone chipping, 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	108.00	614.17	66330.36	M-043
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				26438.61	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				46708.21	
		Cost of 4000 sqm = a+b+c+d+e				513790.34	
		<b>Rate per sqm = (a+b+c+d+e)/4000</b>				128.45	
					say	<b>128.00</b>	
<b>5.11B</b>	<b>509</b>	<b>Mix Seal Surfacing</b>					
		Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.9 mm (Type-A) or 13.2 mm to 0.9 mm (Type-B) aggregates using penetration grade bitumen to required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a three wheel 8-10 kN static roller and finishing to required level and grades as per Technical Specification Clause 509					
		<b>Case - II By Mechanical Means</b>					
		<b>Type A</b>					
	(I)	<b>Bitumen (S-90)/(80/100grade)</b>					

Analysis of Rates

**BASES AND SURFACES COURSES (BITUMINOUS) (With Mechanical Paver and 40-60 TPH, HMP)**

Sr. No.	Ref. of MoRD Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Unit = sqm					
		Taking output = 4000 sqm (80 cum)					
		<b>a) Labour</b>					
		Mate	day	0.52	272.00	141.44	L-12
		Mazdoor (Unskilled)	day	10.00	257.00	2570.00	L-13
		Mazdoor (Skilled)	day	3.00	325.00	975.00	L-15
		<b>b) Machinery</b>					
		HMP of appropriate capacity	hour	6.00	23018.00	138108.00	P&M-024
		Electric generator set 125 KVA	hour	6.00	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.00	1373.00	8238.00	P&M-017
		Tipper 5.5 10 t capacity	hour	3.60	1018.00	3664.80	P&M-048
		Paver finisher	hour	6.00	1390.00	8340.00	P&M-035
		Three wheel 80-100 kN static roller	hour	6.00	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		Bitumen (S-90) @ 22 kg per 10 sqm	t	8.80	32030.00	281864.00	M-075
		Stone crushed aggregates 11.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	108.00	345.52	37316.16	M-041
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				30103.52	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				53182.89	
		Cost of 4000 sqm = a+b+c+d+e				585011.82	
		<b>Rate per sqm = (a+b+c+d+e)/4000</b>				146.25	
					say	<b>146.00</b>	
		<b>(II) Bitumen (S-65)/(60/70grade)</b>					
		Unit = sqm					
		Taking output = 4000 sqm (80 cum)					
		<b>a) Labour</b>					
		Mate	day	0.52	272.00	141.44	L-12
		Mazdoor (Unskilled)	day	10.00	257.00	2570.00	L-13
		Mazdoor (Skilled)	day	3.00	325.00	975.00	L-15
		<b>b) Machinery</b>					
		HMP of appropriate capacity	hour	6.00	23018.00	138108.00	P&M-024
		Electric generator set 125 KVA	hour	6.00	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.00	1373.00	8238.00	P&M-017
		Tipper 5.5 10 t capacity	hour	3.60	1018.00	3664.80	P&M-048
		Paver finisher	hour	6.00	1390.00	8340.00	P&M-035
		Three wheel 80-100 kN static roller	hour	6.00	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		Bitumen (S-65) @ 22 kg per 10 sqm	t	8.80	32830.00	288904.00	M-074
		Stone crushed aggregates 11.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	108.00	345.52	37316.16	M-041
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				30525.92	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				53929.13	
		Cost of 4000 sqm = a+b+c+d+e				593220.46	
		<b>Rate per sqm = (a+b+c+d+e)/4000</b>				148.31	
					say	<b>148.00</b>	
		<b>Type B</b>					
		<b>(I) Bitumen (S-90)/(80/100grade)</b>					
		Unit = sqm					
		Taking output = 4000 sqm (80 cum)					
		<b>a) Labour</b>					
		Mate	day	0.52	272.00	141.44	L-12
		Mazdoor (Unskilled)	day	10.00	257.00	2570.00	L-13
		Mazdoor (Skilled)	day	3.00	325.00	975.00	L-15
		<b>b) Machinery</b>					
		HMP of appropriate capacity	hour	6.00	23018.00	138108.00	P&M-024
		Electric generator set 125 KVA	hour	6.00	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.00	1373.00	8238.00	P&M-017
		Tipper 5.5 10 t capacity	hour	3.60	1018.00	3664.80	P&M-048
		Paver finisher	hour	6.00	1390.00	8340.00	P&M-035
		Three wheel 80-100 kN static roller	hour	6.00	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		Bitumen (S-90) @ 19 kg per 10 sqm	t	7.60	32030.00	243428.00	M-075
		Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	108.00	470.04	50764.32	M-042
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				28604.25	

14600  
12/10/19

Analysis of Rates

**BASES AND SURFACES COURSES (BITUMINOUS) (With Mechanical Paver and 40-60 TPH, HMP)**

Sr. No.	Ref. of MoRD Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		e) Contractor's profit @ 0.1 on (a+b+c+d)				50534.18	
		Cost of 4000 sqm = a+b+c+d+e				555875.99	
		Rate per sqm = (a+b+c+d+e)/4000				138.97	
					say	139.00	
		(II) Bitumen (S-65)/(60/70grade)					
		Unit = sqm					
		Taking output = 4000 sqm (80 cum)					
		a) Labour					
		Mate	day	0.52	272.00	141.44	L-12
		Mazdoor (Unskilled)	day	10.00	257.00	2570.00	L-13
		Mazdoor (Skilled)	day	3.00	325.00	975.00	L-15
		b) Machinery					
		HMP of appropriate capacity	hour	6.00	23018.00	138108.00	P&M-024
		Electric generator set 125 KVA	hour	6.00	2637.00	15822.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.00	1373.00	8238.00	P&M-017
		Tipper 5.5 10 t capacity	hour	3.60	1018.00	3664.80	P&M-048
		Paver finisher	hour	6.00	1390.00	8340.00	P&M-035
		Three wheel 80-100 kN static roller	hour	6.00	781.00	4686.00	P&M-044
		c) Material					
		Bitumen (S-65) @ 19 kg per 10 sqm	t	7.60	32830.00	249508.00	M-074
		Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	108.00	470.04	50764.32	M-042
		d) Overhead charges @ 0.06 on (a+b+c)				28969.05	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				51178.66	
		Cost of 4000 sqm = a+b+c+d+e				562965.27	
		Rate per sqm = (a+b+c+d+e)/4000				140.74	
					say	141.00	
5.12B	510	Seal Coat					
		Providing and laying seal coat sealing the voids in a bituminous surface laid to the specified levels, grade and cross fall using Type B and as per Technical Specification Clause 510					
	510	Case - II : Type B					
		(I) Bitumen (S-90)/(80/100grade)					
		Unit = sqm					
		Taking output = 5000 sqm (30 cum)					
		a) Labour					
		Mate	day	0.16	272.00	43.52	L-12
		Mazdoor (Unskilled)	day	4.00	257.00	1028.00	L-13
		b) Machinery					
		HMP of 30/40 t per hour	hour	2.00	23018.00	46036.00	P&M-024
		Electric generator set 125 KVA	hour	2.00	2637.00	5274.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	2.00	1373.00	2746.00	P&M-017
		Tipper 5.5 10 t capacity	hour	1.36	1018.00	1384.48	P&M-048
		Paver finisher	hour	2.00	1390.00	2780.00	P&M-035
		Three wheel 80-100 kN static roller	hour	2.00	781.00	1562.00	P&M-044
		c) Material					
		Bitumen (S-90) @ 6.80 kg per 10 sqm	t	3.40	32030.00	108902.00	M-075
		Crushed sand defined as passing 2.36 mm sieve and retained on 180 micron sieve applied @ 0.06 cum per 10 sqm	cum	30.00	116.85	3505.50	M-006
		d) Overhead charges @ 0.06 on (a+b+c)				10395.69	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				18365.72	
		Cost of 5000 sqm = a+b+c+d+e				202022.91	
		Rate per sqm = (a+b+c+d+e)/5000				40.40	
					say	40.40	
		(II) Bitumen (S-65)/(60/70grade)					
		Unit = sqm					
		Taking output = 5000 sqm (30 cum)					
		a) Labour					
		Mate	day	0.16	272.00	43.52	L-12
		Mazdoor (Unskilled)	day	4.00	257.00	1028.00	L-13
		b) Machinery					



Analysis of Rates

**BASES AND SURFACES COURSES (BITUMINOUS) (With Mechanical Paver and 40-60 TPH, HMP)**

Sr. No.	Ref. of MoRD Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		HMP of 30/40 t per hour	hour	2.00	23018.00	46036.00	P&M-024
		Electric generator set 125 KVA	hour	2.00	2637.00	5274.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	2.00	1373.00	2746.00	P&M-017
		Tipper 5.5 10 t capacity	hour	1.36	1018.00	1384.48	P&M-048
		Paver finisher	hour	2.00	1390.00	2780.00	P&M-035
		Three wheel 80-100 kN static roller	hour	2.00	781.00	1562.00	P&M-044
		<b>c) Material</b>					
		Bitumen (S-65) @ 6.80 kg per 10 sqm	t	3.40	32830.00	111622.00	M-074
		Crushed sand defined as passing 2.36 mm sieve and retained on 180 micron sieve applied @ 0.06 cum per 10 sqm	cum	30.00	116.85	3505.50	M-006
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				10558.89	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				18654.04	
		Cost of 5000 sqm = a+b+c+d+e				205194.43	
		<b>Rate per sqm = (a+b+c+d+e)/5000</b>				41.04	
					<b>say</b>	<b>41.00</b>	
		<b>Note:</b> Since seal coat is required to be provided over the premix carpet on the same day, out of the 6 working hours of the HMP, 4.00 hours are proposed to be utilised for the premix carpet and the balance 2.00 hours have been considered for this case.					

*Lokesh*  
*12/10/19*

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## **CHAPTER-6**

# **CEMENT CONCRETE PAVEMENT**

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## Chapter – 6

### Cement Concrete Pavement

#### Preamble:

1. High capacity batch mix plants of 75 cum/hour (effective output) has been considered in the rate analysis of cement concrete pavement works.
2. While tippers have been provided for transportation of dry lean cement concrete and rolled cement concrete, transit truck mixers have been considered for the cement concrete pavement.
3. Super plasticizer admixture has been provided to improve workability with reduced water cement ratio.
4. Cement 43 grade has been catered for the cement concrete pavement i.e., for pavement quality concrete to get higher strength. However, for dry lean concrete, cement of 33 grade may be preferred.
5. While a slip form paver has been catered for the top layer of concrete pavement, a mechanical paver has been provided for dry lean and rolled cement concrete.
6. The letter 'L' represents lead in km one way. This will vary from project to project and is required to be ascertained at site to provide for the cost of carriage of the mix to the work site.
7. Materials provided in the rate analysis are for estimating purpose. Exact quantity of materials will be determined from the job mix formula.

#### 8. Fibre Reinforced Concrete for Pavements

Fibre reinforcement concrete is a recent development in the field of cement concrete pavements. In industrialized countries, it has been in use for nearly 20 years now for cement concrete pavements and overlays. In India, it is still on an experimental stage. IRC have already published a code, IRC:SP:46-1997 for “Steel Fibre Reinforced Concrete for Pavements” which specifies a fibre content of 0.75 to 1.5 per cent and brings out the design aspects, material to be used, mix design and construction procedure.

Some firms have developed Polypropylene fibres to be used in place of steel fibres. These fibres reduce permeability in concrete and prevent shrinkage cracks, which eliminate chances of corrosion of steel.

The organizations concerned with the construction of cement concrete pavements and overlays on roads and airfield who have experimented on fibre reinforcement should give a feed back to the Ministry of Road Transport and Highways so that this item can be included in the Specifications laid down by the Ministry and eventually included in the Standard Data Book for Analysis of Rates.

*Chh.*  
12/8/17

**9. Ultra- Thin White Topping**

Some of the firms in developed countries, in the recent past have come-up with a innovative idea of laying 50 to 100 mm thick overlay of high strength fibre reinforced cement concrete over a distressed asphalt pavement. They claim to have achieved 2 to 3 times layer durability than asphalt overlays. There is a need to gather more details of the work and include in the specifications in case found suitable to conditions in our country.

Ans:  
12/8/9

Summary of Rate Analysis  
**CHAPTER - 6**  
**CEMENT CONCRETE PAVEMENTS**

Item No.	Description	Unit	Rate (₹)
6.1	<b>Dry Lean Cement Concrete Sub- base</b> (Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.)	cum	1875.00
6.2	<b>Cement Concrete Pavement</b> (Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing. )	cum	4602.00
6.3	<b>Rolled Cement Concrete Base</b> (Construction of rolled cement concrete base course with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm with minimum, aggregate cement ratio 15:1 and minimum cement content of 200 kg/cum, aggregate gradation to be as per table 600-4 after blending, mixing in batching plant at optimum moisture content, transporting to site, laying with a paver with electronic sensor, compacting with 8-10 tonnes smooth wheeled vibratory roller to achieve, the designed flexural strength, finishing and curing.)	cum	2177.00
6.4	<b>Transition section between rigid and flexible pavement</b> (Due to change in the properties of materials and type of construction, a gradual changeover from rigid pavement to flexible pavement is desirable to avoid any damage at the butting joint. After provision of an expansion joint in the cement concrete slab, the thickness of slab should be tapered to 10 cm over a length of 3 m towards the flexible pavement. The deficiency of thickness caused due to tapering of the slab should be made up by the asphaltic layers.)		-
6.5	<b>Construction of Base/Sub-base of pavement with lean concrete - fly ash.</b> (Construction of Base/sub-base using cement, sand, fly ash and coarse aggregates proportioned as per table 4 of IRC: 74/1979 and with water content ratio, slump and compressive strength as defined in the said table, mix prepared in a batching and mixing plant and compacted with a vibratory roller 8-10 tonnes capacity within the time limit laid down vide clause 7.6.3 of IRC: 74-1979, construction joints properly formed at the end of day's work, cured for 14 days, all as specified in IRC: 74-1979 and as per approved plans.)	cum	1657.00
6.6	<b>Cement - Fly ash concrete pavement.</b> (Construction of reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, replacing cement by fly ash to the extent of 15% and sand by 10%, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing. )	cum	4264.00

L.A.S.  
 12/8/19



Analysis of Rates  
CHAPTER - 6  
CEMENT CONCRETE PAVEMENTS

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
6.1	601	<b>Dry Lean Cement Concrete Sub- base</b>					
		Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/ cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.					
		<b>Unit = cum</b>					
		<b>Taking output = 450 cum (990 tonne)</b>					
		<b>a) Labour</b>					
		Mate	day	1.120	272.00	304.64	L-12
		Mazdoor skilled	day	6.000	325.00	1950.00	L-15
		Mazdoor	day	22.000	257.00	5654.00	L-13
		<b>b) Machinery</b>					
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	3356.00	20136.00	P&M-068
		Electric generator 100 KVA	hour	6.000	1923.00	11538.00	P&M-080
		Paver with electronic sensor	hour	6.000	3505.00	21030.00	P&M-034
		Vibratory roller 8-10 t capacity	hour	8.000	2029.00	16232.00	P&M-059
		Water tanker 6 KL capacity	hour	8.000	183.00	1464.00	P&M-060
		Tipper	tonne.km	990 x L	8.8600	8771.40	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				877.14	
		<b>c) Material</b>					
		Crushed stone coarse aggregate of 25 mm and 12.5 mm nominal sizes graded as per table 600-1 @ 0.90 cum/cum of concrete conforming to clause 602.2.4.	cum	405.000	584.00	236520.00	M-052 and M-054
		Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	203.000	150.80	30612.40	M-004
		Cement @ 150 kg/cum of concrete	tonne	67.500	5156.00	348030.00	M-081
		Cost of water	KL	48.000	253.69	12177.12	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				43412.08	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				76694.68	
		Cost for 450 cum = a+b+c+d+e				843641.46	
		<b>Rate per cum = (a+b+c+d+e)/450</b>				1874.76	
					<b>say</b>	<b>1875.00</b>	
		<b>Note</b>					
		Quantity provided for aggregate is for estimating purpose. Exact quantity shall be as per mix design.					
6.2	602	<b>Cement Concrete Pavement</b>					
		Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing					
		<b>Unit = cum</b>					
		<b>Taking output = 1050 cum (2415 tonne)</b>					
		<b>a) Labour</b>					
		Mate	day	2.000	272.00	544.00	L-12
		Mazdoor skilled	day	15.000	325.00	4875.00	L-15
		Mazdoor	day	35.000	257.00	8995.00	L-13



Analysis of Rates  
**CEMENT CONCRETE PAVEMENTS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Road Sweeper @ 1250 sqm per hour	hour	2.800	555.00	1554.00	P&M-031
		Front end loader 1 cum bucket capacity	hour	18.000	1373.00	24714.00	P&M-017
		Cement concrete batch mix plant @ 175 cum per hour (effective output)	hour	6.000	7833.00	46998.00	P&M-067
		Electric generator 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		Slip form paver with electronic sensor	hour	6.000	1470.00	8820.00	P&M-006
		Water tanker 6 KL capacity	hour	36.000	183.00	6588.00	P&M-060
		Transit truck agitator 5 cum capacity.	tonne.km	2415xL	6.94	16760.10	Lead =1 km & P&M-050
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				1676.01	
		Concrete joint cutting machine .	hour	12.000	350.00	4200.00	P&M-083
		Texturing machine .	hour	12.000	118.00	1416.00	P&M-088
		<b>c) Material</b>					
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4 .	cum	945.000	584.00	551880.00	M-052 and M-054
		Sand as per IS: 383 and conforming to clause 602.2.4 @ 0.45 cum/cum of concrete	cum	473.000	150.80	71328.40	M-004
		Cement 43 grade @ 400 kg/cum of concrete	tonne	414.000	5156.00	2134584.00	M-081
		32 mm mild steel dowel bars of grade S 240	tonne	9.450	45903.00	433783.35	M-126
		16 mm deformed steel tie bars of grade S 415	tonne	1.170	42532.00	49762.44	M-082
		Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	3675.000	14.78	54316.50	M-164
		Pre moulded Joint filler, 25 mm thick for expansion joint.	sqm	16.330	939.64	15344.32	M-141
		Joint sealant	kg	875.000	24.05	21043.75	M-120
		Sealant primer	kg	116.670	12.59	1468.88	M-097
		Plastic sheath, 1.25 mm thick for dowel bars	sqm	46.670	14.35	669.71	M-138
		Curing compound	liter	1850.000	120.27	222499.50	M-090
		Super plasticizer admixture IS marked as per 9103-1999 @ 0.5 per cent by weight of cement	kg	2070.000	166.14	343909.80	M-180
		Cost of water	KL	216.000	253.69	54797.04	M-189
		Add 1 per cent of material for cost of miscellaneous materials like tarpauline, Hessian cloth, metal cap, cotton / compressible sponge and cradle for dowel bars, work bridges for men to approach concrete surface without walking over it, cutting blades and bites, minor equipments like scabbling machine, threads, ropes, guide wires and any other unforeseen items.				39553.88	
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				248653.66	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				439288.13	
		Cost for 1050cum = a+b+c+d+e				4832169.47	
		<b>Rate per cum = (a+b+c+d+e)/1050</b>				4602.07	
					<b>say</b>	<b>4602.00</b>	
		<b>Note</b>					
		The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.					
6.3	603	<b>Rolled Cement Concrete Base</b>					
		Construction of rolled cement concrete base course with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm with minimum, aggregate cement ratio 15:1 and minimum cement content of 200 kg/cum, aggregate gradation to be as per table 600-4 after blending, mixing in batching plant at optimum moisture content, transporting to site, laying with a paver with electronic sensor, compacting with 8-10 tonnes smooth wheeled vibratory roller to achieve, the designed flexural strength, finishing and curing.					
		<b>Unit = cum</b>					
		<b>Taking output = 450 cum (990 tonne)</b>					
		<b>a) Labour</b>					

Calc.  
12/8/19

Analysis of Rates  
**CEMENT CONCRETE PAVEMENTS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	1.200	272.00	326.40	L-12
		Mazdoor skilled	day	7.000	325.00	2275.00	L-15
		Mazdoor	day	23.000	257.00	5911.00	L-13
		<b>b) Machinery</b>					
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	3356.00	20136.00	P&M-068
		Electric generator 100 KVA	hour	6.000	1923.00	11538.00	P&M-080
		Paver with electronic sensor @ 75 cum/hr.	hour	6.000	3505.00	21030.00	P&M-034
		Vibratory roller 8-10 t capacity	hour	8.000	2029.00	16232.00	P&M-059
		Water tanker with 5 km lead 6 KL capacity	hour	8.000	183.00	1464.00	P&M-060
		Tipper	tonne.km	990xL	8.86	8771.40	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				877.14	
		<b>c) Material</b>					
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.3.	cum	405.000	584.00	236520.00	M-052 and M-054
		Sand as per IS: 383 and conforming to clause 602.2.3 @ 0.45 cum/cum of concrete	cum	203.000	150.80	30612.40	M-004
		Cement @ 200 kg/cum of concrete	tonne	90.000	5156.00	464040.00	M-081
		Cost of water	KL	48.000	253.69	12177.12	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				50408.91	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				89055.74	
		Cost for 450cum = a+b+c+d+e				979613.10	
		<b>Rate per cum = (a+b+c+d+e)/450</b>				2176.92	
					<b>say</b>	<b>2177.00</b>	
		<b>Note</b>					
		The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.					
6.4	New	<b>Transition Section between Rigid and Flexible Pavement</b>					
		Due to change in the properties of materials and type of construction, a gradual changeover from rigid pavement to flexible pavement is desirable to avoid any damage at the butting joint. After provision of an expansion joint in the cement concrete slab, the thickness of slab should be tapered to 10 cm over a length of 3 m towards the flexible pavement. The deficiency of thickness caused due to tapering of the slab should be made up by the asphaltic layers					
		The quantities of items should be worked out based on the approved design and drawings and priced as per rates given under respective clauses for cement concrete and asphaltic work.					
6.5	Suggestive	<b>Construction of Base/Sub-Base of Pavement with Lean Concrete - Flyash.</b>					
		Construction of Base/sub-base using cement, sand, fly ash and coarse aggregates proportioned as per table 4 of IRC: 74/1979 and with water content ratio, slump and compressive strength as defined in the said table, mix prepared in a batching and mixing plant and compacted with a vibratory roller 8-10 tonnes capacity within the time limit laid down vide clause 7.6.3 of IRC: 74-1979, construction joints properly formed at the end of day's work, cured for 14 days, all as specified in IRC: 74-1979 and as per approved plans.					
		<b>Unit = cum</b>					
		<b>Taking output = 450 cum (990 tonne)</b>					
		<b>a) Labour</b>					

Analysis of Rates  
**CEMENT CONCRETE PAVEMENTS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	1.120	272.00	304.64	L-12
		Mazdoor skilled	day	6.000	325.00	1950.00	L-15
		Mazdoor	day	22.000	257.00	5654.00	L-13
		<b>b) Machinery</b>					
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	3356.00	20136.00	P&M-068
		Electric generator 100 KVA	hour	6.000	1923.00	11538.00	P&M-080
		Paver finisher with electronic sensor	hour	6.000	3505.00	21030.00	P&M-034
		Vibratory roller 8-10 t capacity	hour	8.000	2029.00	16232.00	P&M-059
		Water tanker 6 KL capacity	hour	8.000	183.00	1464.00	P&M-060
		Tipper 10 T Capacity	tonne.km	990 x L	8.86	8771.40	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				877.14	
		<b>c) Material</b>					
		Crushed stone coarse aggregate of 40 mm nominal size @ 0.90 cum/cum of concrete conforming to table 2 of IRC: 74-1979.	cum	405.000	441.08	178637.40	M-055
		Coarse Sand as per IS: 383 - 1970	cum	110.960	150.80	16732.77	M-004
		Cement @ 150 kg/cum of concrete	tonne	67.500	5156.00	348030.00	M-081
		Fly ash conforming to IS: 3812 ( Part II )	cum	91.540	0.00	0.00	M-011
		( Total fine aggregates = 450 x 0.45 = 202.50 cum To be divided in ratio of 2 sand : 1.65 flyash. Refer table 4 of IRC: 74-1979).					
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				38375.72	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				67797.11	
		Cost for 450cum = a+b+c+d+e				745768.18	
		<b>Rate per cum = (a+b+c+d+e)/450</b>				1657.26	
					<b>say</b>	<b>1657.00</b>	
	<b>Note</b>	1. Depending upon approved designs, crushed stone aggregates of nominal size 20mm can also be used as per gradation given in table 2 of IRC: 74-1979.					
		2. The ratio of specific gravities of fly ash and sand has been assumed to be 0.827.					
		3. The quantities of materials given in the analyses are for estimating purposes. Actual quantities shall be as per job mix formula.					
		4. Construction procedure as laid down in clause, of IRC: 74-1979 shall be followed.					
<b>6.6</b>	<b>Suggestive</b>	<b>Cement - Flyash Concrete Pavement.</b>					
		Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, replacing cement by fly ash to the extent of 15 per cent and sand by 10 per cent, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing					
		<b>Unit = cum</b>					
		<b>Taking output = 1050 cum (2415 tonne)</b>					
		<b>a) Labour</b>					
		Mate	day	2.000	272.00	544.00	L-12
		Mazdoor skilled	day	15.000	325.00	4875.00	L-15
		Mazdoor	day	35.000	257.00	8995.00	L-13
		<b>b) Machinery</b>					
		Road Sweeper @ 1250 sqm per hour	hour	2.800	555.00	1554.00	P&M-031

L.S.S.  
12/8/19

Analysis of Rates  
**CEMENT CONCRETE PAVEMENTS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Front end loader 1 cum bucket capacity	hour	18.000	1373.00	24714.00	P&M-017
		Cement concrete batch mix plant @ 175 cum per hour (effective output)	hour	6.000	7833.00	46998.00	P&M-067
		Electric generator 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		Slip form paver with electronic sensor	hour	6.000	1470.00	8820.00	P&M-006
		Water tanker 6 KL capacity	hour	36.000	183.00	6588.00	P&M-060
		Transit truck agitator 5 cum capacity.	tonne.km	2415xL	6.94	16760.10	P&M-050 Lead= 1 km
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				1676.01	
		Concrete joint cutting machine .	hour	12.000	350.00	4200.00	P&M-083
		Texturing machine .	hour	12.000	118.00	1416.00	P&M-088
		<b>c) Material</b>					
		Crushed stone coarse aggregates of 25mm and 12.5mm nominal size @ 0.90 cum/cum of concrete conforming to clause 602.2.4	cum	945.000	584.00	551880.00	M-052 and M-054
		Sand as per IS: 383 and conforming to clause 602.2.4	cum	425.000	150.80	64090.00	M-004
		Cement 43 grade	tonne	357.000	5156.00	1840692.00	M-081
		Fly ash conforming to IS: 3812-1966 (Part-I)	tonne	109.000	0.00	0.00	M-011
		32 mm mild steel dowel bars of grade S 240	tonne	9.450	45903.00	433783.35	M-126
		16 mm deformed steel tie bars of grade S 415	tonne	1.170	42532.00	49762.44	M-082
		Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	3675.000	14.78	54316.50	M-164
		Pre moulded Joint filler, 25 mm thick for expansion joint	sqm	16.330	939.64	15344.32	M-141
		Joint sealant	kg	875.000	24.05	21043.75	M-120
		Sealant primer	kg	116.670	12.59	1468.88	M-097
		Plastic sheath, 1.25 mm thick for dowel bars	sqm	46.670	14.35	669.71	M-138
		Curing compound	liter	1850.000	120.27	222499.50	M-090
		Super plastisizer admixture IS marked as per 9103-1999 @ 0.5 per cent by weight of cement	kg	2070.000	166.14	343909.80	M-180
		Cost of water	KL	216.000	253.69	54797.04	M-189
		Add 1 per cent of material for cost of miscellaneous materials like tarpauline, Hessian cloth, metal cap, cotton / compressible sponge and cradle for dowel bars, work bridges for men to approach concrete surface without walking over it, cutting blades and bites, minor equipments like scabbling machine, threads, ropes, guide wires and any other unforeseen items.				36542.57	
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				230405.16	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				407049.11	
		Cost for 1050cum = a+b+c+d+e				4477540.25	
		<b>Rate per cum = (a+b+c+d+e)/1050</b>				4264.32	
					<b>say</b>	<b>4264.00</b>	
	<b>Note</b>	1.The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.					
		2.IRC: 68-1976 may be referred for guidelines on the design of cement-fly ash concrete for rigid pavement construction.					
		<b>*Calculation of cement, sand and fly ash.</b>					
		Cement @ 400 kg/cum = 1050 x 400 = 420 tonnes. 15 per cent of cement to be replaced by fly ash = 63 tonnes. Balance cement = 357 tonnes. Quantity of fly ash = 63 x specific gravity of fly ash /specific gravity of cement = 63 x 2.25/3.15 = 45 tonnes.					
		Sand @ 0.45 cum / cum of concrete = 1050 x 0.45 = 472.50 x 1.6 = 756 tonnes.10 per cent to be replaced by flyash. Balance sand = 756 x 0.9 = 680.4 tonnes = 680.4 / 1.6 = 425 cum. Quantity of flyash = (756-680.4) x specific gravity of fly ash/specific gravity of sand = 76.4 x 2.25 / 2.687 = 63.97 tonnes (say 64 tonnes)					
		<b>Fly ash Total fly ash = 45 + 64 = 109 tonnes.</b>					



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## **CHAPTER-7**

# **GEOSYNTHETICS AND REINFORCED EARTH**

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## Chapter – 7

### Geosynthetic and Reinforced Earth

#### Preamble:

1. The specifications for geosynthetics which includes geotextiles, geogrids, geonets, geomembranes and geocomposites shall be as per section 700 of MoRT&H Specifications.
2. The geotextile proposed for sub-surface drain shall satisfy the requirements given in Clause 702.2.3.
3. Care shall be taken to ensure that the geotextile or core material is not exposed to dry light for more than a cumulative total of 50 hours.
4. Bitumen overlay shall follow on the same day where paving fabric is laid.
5. The size of mesh opening for gabions and mattresses laid with geogirds and geonets shall be between 35 mm and 100 mm.
6. The size of the boulders shall be at least 100 mm or double the size of the aperture whichever is larger.
7. The boulders shall be laid in crates as per the methodology given in Clause 2503.3.
8. The usual size of gabions in aprons is 1m x 5 m with a height of 600 mm and baffles at 1 m centers.

*Chas.*  
12/3/19





# Summary of Rate Analysis

## CHAPTER - 7 GEOSYNTHETICS AND REINFORCED EARTH

Item No.	Description	Unit	Rate (₹)
7.1	<b>Sub- Surface Drain with Geotextiles</b> (Construction of sub surface drain 200 mm dia using geotextiles treated with carbon black with physical properties as given in clause 702.2.3 formed in to a stable network and a planar geocomposite structure, joints wrapped with geotextile to prevent ingress of soil, all as per clause 702 and approved drawings including excavation and backfilling.)	metre	#VALUE!
7.2	<b>Narrow Filter Sub- Surface Drain</b> (Construction of a narrow filter sub- surface drain consisting of porous or perforated pipe laid in narrow trench surrounded by a geotextile filter fabric, with a minimum of 450 mm overlap of fabric and installed as per clause 702.3 and 309.3.5 including excavation and backfilling.)	metre	406.00
7.3	<b>Laying Paving Fabric Beneath a Pavement Overlay</b> (Providing and laying paving fabric with physical requirements as per table 704-2 over a tack coat of paving grade Bitumen 80-100 penetration, laid at the rate of 1 kg per sqm over thoroughly cleaned and repaired surface to provide a water resistant membrane and crack retarding layer. Paving fabric to be free of wrinkling and folding and to be laid before cooling of tack coat, brooming and rolling of surface with pneumatic roller to maximise paving fabric contact with pavement surface.)	sqm	#VALUE!
7.4	<b>Laying Boulder Apron in Crates of Synthetic Geogrids</b> (Providing, preparing and laying of geogrid crated apron 1 m x 5 m, 600 mm thick including excavation and backfilling with baffles at 1 metre interval, made with geogrids having characteristics as per clause 704.2, joining sides with connectors/ring staples, top corners to be tie tensioned, placing of suitable cross interval ties in layers of 300 mm connecting opposite side with lateral braces and tied with polymer braids to avoid bulging, constructed as per clause 704.3. filled with stone with minimum size of 200 mm and specific gravity not less than 2.65, packed with stone spalls, keyed to the foundation recess in case of sloping ground and laid over a layer of geotextile to prevent migration of fines, all as per clause 704 and laid as per clause 2503.3 and approved design.)	cum	#VALUE!
7.5	<b>Reinforced Earth Structures Retaining Wall</b> (Reinforced earth structures retaining walls have four main components as under: a) Excavation for foundation, foundation concrete and cement concrete grooved seating in the foundation for facing elements (facia material). b) Facia material and its placement. c) Assembling, joining with facing elements and laying of the reinforcing elements. d) Earthfill with granular material which is to be retained by the wall.)		
(i)	<b>Assembling, joining and laying of reinforcing elements.</b>		
A	<b>With reinforcing element of steel / Aluminium strips / polymeric strips.</b>		
Type 1	<b>1. Galvanised carbon steel strips</b>	metre	#VALUE!
Type 2	<b>2. Copper Strips</b>	metre	#VALUE!
Type 3	<b>3. Aluminium Strips</b>	metre	#VALUE!
Type 4	<b>4. Stainless steel strips</b>	metre	#VALUE!
Type 5	<b>5. Glass reinforced polymer/fibre reinforced polymer/polymeric strips</b>	metre	#VALUE!
B	<b>With reinforcing elements of synthetic geogrids</b>	sqm	#VALUE!
(ii)	<b>Facing elements of RCC</b>	sqm	1256.00

*Calc.*  
12/8/19



Analysis of Rates  
CHAPTER - 7  
**GEOSYNTHETICS AND REINFORCED EARTH**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
7.1	702	<b>Sub-Surface Drain with Geotextiles</b>					
		Construction of sub surface drain 200 mm dia using geotextiles treated with carbon black with physical properties as given in clause 702.2.3 formed in to a stable network and a planar geocomposite structure, joints wrapped with geotextile to prevent ingress of soil, all as per clause 702 and approved drawings including excavation and backfilling					
		<b>Unit = Running metre</b>					
		<b>Taking output = one metre</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor skilled	day	0.250	325.00	81.25	L-15
		Mazdoor	day	0.500	257.00	128.50	L-13
		<b>b) Material</b>					
		Geonets, geomembrane and geotextile to make planar geocomposite stable network for sub surface drain including wrapping of joints with 160 mm over lapping with geotextile .					
		Geonets	sqm	1.000	101.66	101.66	M-107
		Geomembrane	sqm	1.000	input	#VALUE!	M-106
		Geotextile	sqm	2.000	79.47	158.94	M-108
		Add 2 per cent cost of material for miscellaneous items like synthetic cord				#VALUE!	
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				#VALUE!	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				#VALUE!	
		<b>Rate per metre = a+b+c+d</b>				#VALUE!	
					say	#VALUE!	
		<b>Note</b> Surplus excavated material to be used at site. Hence seprate cost for disposal not added.					
7.2	702.4	<b>Narrow Filter Sub-Surface Drain</b>					
		Construction of a narrow filter sub- surface drain consisting of porous or perforated pipe laid in narrow trench surrounded by a geotextile filter fabric, with a minimum of 450 mm overlap of fabric and installed as per clause 702.3 and 309.3.5 including excavation and backfilling					
		<b>Unit = Running metre length</b>					
		<b>Taking output = one metre</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor skilled	day	0.250	325.00	81.25	L-15
		Mazdoor	day	0.500	257.00	128.50	L-13
		<b>b) Material</b>					
		Perforated geosynthetic pipe 150 mm dia	metre	1.000	25.91	25.91	M-134
		Geotextile filter fabric	sqm	1.250	79.47	99.34	M-109
		Add 2 per cent cost of material for miscellaneous item like synthetic cord				2.50	
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				20.90	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				36.93	
		<b>Rate per metre = a+b+c+d</b>				406.21	
					say	406.00	
		<b>Note</b> Surplus excavated material to be used at site. Hence Separate cost for disposal not added.					
7.3	703	<b>Laying Paving Fabric Beneath a Pavement Overlay</b>					
		Providing and laying paving fabric with physical requirements as per table 704-2 over a tack coat of paving grade Bitumen 80-100 penetration, laid at the rate of 1 kg per sqm over thoroughly cleaned and repaired surface to provide a water resistant membrane and crack retarding layer. Paving fabric to be free of wrinkling and folding and to be laid before cooling of tack coat, brooming and rolling of surface with pneumatic roller to maximise paving fabric contact with pavement surface					

Analysis of Rates  
**GEOSYNTHETICS AND REINFORCED EARTH**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Unit = sqm</b>					
		<b>Taking output = 2800 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.800	272.00	217.60	L-12
		Mazdoor	day	20.000	257.00	5140.00	L-13
		<b>b) Machinery</b>					
		Road sweeper 1250 sqm per hour	hour	2.240	555.00	1243.20	P&M-031
		Pneumatic roller 14 tonnes 2000 sqm per hour	hour	1.400	1872.00	2620.80	P&M-037
		Bitumen pressure distributor 1750 sqm per hour	hour	1.680	1613.00	2709.84	P&M-004
		<b>c) Material</b>					
		Paving Fabric	sqm	2940.000	input	#VALUE!	M-133
		Paving Bitumen 80-100	tonne	2.800	32030.00	89684.00	M-075
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				#VALUE!	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				#VALUE!	
		Cost for 2800 sqm = a+b+c+d+e				#VALUE!	
		<b>Rate per sqm = (a+b+c+d+e)/2800</b>				#VALUE!	
					say	#VALUE!	
7.4	704	<b>Laying Boulder Apron in Crates of Synthetic Geogrids</b>					
		Providing, preparing and laying of geogrid crated apron 1 m x 5 m, 600 mm thick including excavation and backfilling with baffles at 1 metre interval, made with geogrids having characteristics as per clause 704.2, joining sides with connectors/ring staples, top corners to be tie tensioned, placing of suitable cross interval ties in layers of 300 mm connecting opposite side with lateral braces and tied with polymer braids to avoid bulging, constructed as per clause 704.3. filled with stone with minimum size of 200 mm and specific gravity not less than 2.65, packed with stone spalls, keyed to the foundation recess in case of sloping ground and laid over a layer of geotextile to prevent migration of fines, all as per clause 704 and laid as per clause 2503.3 and approved design.					
		<b>Unit = cum</b>					
		<b>Taking output = 3.00 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.060	272.00	16.32	L-12
		Mazdoor skilled	day	0.500	325.00	162.50	L-15
		Mazdoor	day	1.500	257.00	385.50	L-13
		<b>b) Material</b>					
		Geo grids	sqm	21.000	input	#VALUE!	M-105
		Connectors/ Staples	each	50.000	input	#VALUE!	M-085
		Polymer braids	metre	20.000	input	#VALUE!	M-140
		Stones with minimum size of 200 mm	cum	3.450	303.85	1048.28	M-003
		Stones spall for filling voids	cum	0.450	303.85	136.73	M-008
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				#VALUE!	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				#VALUE!	
		Cost for 3 cum = a+b+c+d				#VALUE!	
		<b>Rate per cum = (a+b+c+d)/ 3</b>				#VALUE!	
					say	#VALUE!	
7.5	3100	<b>Reinforced Earth Structures</b>					
		Reinforced earth Structures have four main components as under:					
		a) Excavation for foundation, foundation concrete and cement concrete grooved seating in the foundation for facing elements (facia material).					
		b) Facia material and its placement.					
		c) Assembling, joining with facing elements and laying of the reinforcing elements.					

Calc.  
12/8/19

Analysis of Rates  
**GEOSYNTHETICS AND REINFORCED EARTH**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		d) Earth fill with granular material which is to be retained by the wall.					
		Each component is analysed separately as under:					
		considering Average height of wall = 8 m.					
7.5	3102	(i) Assembling, joining and laying of reinforcing elements.					
	A	With reinforcing element of steel / Aluminium strips / polymeric strips.					
		Unit = Running Metre					
		Taking Output = 450 m					
		a) Labour					
		Mate	day	0.360	272.00	97.92	L-12
		Mazdoor	day	6.000	257.00	1542.00	L-13
		Mazdoor skilled	day	3.000	325.00	975.00	L-15
		b) Material					
		@ Reinforcement strips 60 mm wide 5 mm thick as per clause 3102.					
		1.Galvanised carbon steel strips	metre	450*1.1	input	#VALUE!	M-154
		or					
		2.Copper Strips	metre	450*1.1	input	#VALUE!	M-153
		or					
		3.Aluminium Strips	metre	450*1.1	input	#VALUE!	M-157
		or					
		4.Stainless steel strips	metre	450*1.1	input	#VALUE!	M-156
		or					
		5.Glass reinforced polymer/fibre reinforced polymer/polymeric strips	metre	450*1.1	input	#VALUE!	M-155
		@ Any one of the above alternative may be adopted as per approved design.					
		Add 10 per cent of the cost of reinforcing strip towards accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia pannels, overlaps, heat bonding or extension.					
	Type 1	1.Galvanised carbon steel strips					
		c) Overhead charges @ 0.06 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Cost of 450 m = a+b+c+d				#VALUE!	
		Rate per metre =(a+b+c+d)/450				#VALUE!	
					say	#VALUE!	
	Type 2	2.Copper Strips					
		c) Overhead charges @ 0.06 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Cost of 450 m = a+b+c+d				#VALUE!	
		Rate per metre =(a+b+c+d)/450				#VALUE!	
					say	#VALUE!	
	Type 3	3.Aluminium Strips					
		c) Overhead charges @ 0.06 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Cost of 450 m = a+b+c+d				#VALUE!	
		Rate per metre =(a+b+c+d)/450				#VALUE!	
					say	#VALUE!	
	Type 4	4.Stainless steel strips					
		c) Overhead charges @ 0.06 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Cost of 450 m = a+b+c+d				#VALUE!	

Analysis of Rates  
**GEOSYNTHETICS AND REINFORCED EARTH**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Rate per metre $= (a+b+c+d)/450$				#VALUE!	
					say	#VALUE!	
	Type 5	5. Glass reinforced polymer/fibre reinforced polymer/polymeric strips					
		c) Overhead charges @ 0.06 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Cost of 450 m = a+b+c+d				#VALUE!	
		Rate per metre $= (a+b+c+d)/450$				#VALUE!	
					say	#VALUE!	
7.5(i)	B	With reinforcing elements of synthetic geogrids					
		Unit = sqm					
		Taking output = 300 sqm					
		a) Labour					
		Mate	day	0.360	272.00	97.92	L-12
		Mazdoor	day	6.000	257.00	1542.00	L-13
		Mazdoor skilled	day	3.000	325.00	975.00	L-15
		b) Material					
		Synthetic Geogrids as per clause 3102.8 and approved design and specifications.	sqm	300.000	input	#VALUE!	M-181
		Add 10 per cent of the cost of reinforcing elements (synthetic geogrids) for accessories like tie-strips, nuts and bolts and loops/lugs for joining reinforcing elements with the fascia pannels, overlaps and other protective elements for synthetic geogrids.				#VALUE!	
		c) Overhead charges @ 0.06 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Cost of 300 sqm of Synthetic geogrids = a+b+c+d				#VALUE!	
		Rate per sqm $= (a+b+c+d)/300$				#VALUE!	
					say	#VALUE!	
7.5	3104	(ii) Facing elements of RCC					
		Unit = sqm					
		Taking output = 75 sqm					
		a) Labour					
		Mate	day	0.180	272.00	48.96	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		Mazdoor skilled	day	1.500	325.00	487.50	L-15
		b) Machinery					
		Light crane with lifting capacity upto 3 tonne	hour	6.000	537.00	3222.00	P&M-013
		c) Material					
		Pre-cast RCC M-35 facing elements of size as per design and 18 cm thick for 75 sqm. (Refer Item 12.8 (H))	cu.m	13.500	4677.00	63139.50	Item 12.8 (H) Case I
		HYSD steel @ 5 kg / sqm (Refer Item 12.6)	tonnes	0.380	63203.00	24017.14	Item 13.6
		Add 2 per cent of cost of fascia pannels, for all necessary temporary form work, scaffolding and provision of loops/lugs for lifting of pannels and joining the reinforcing elements.				1743.13	
		d) Overhead charges @ 0.06 on (a+b)				271.77	
		e) Contractor's profit @ 0.1 on (a+b+d)				480.12	
		Cost for 75 sqm = a+b+c+d+e				94181.12	
		Rate per sqm $= (a+b+c+d+e)/75$				1255.75	
					say	1256.00	
	Note	1. The specification and construction details to be adopted shall be as per section 3100 of MoRTH Specification.					
		2. Drainage arrangement shall be made as per approved design and drawings.					

Calc.  
12/8/19

Analysis of Rates  
**GEOSYNTHETICS AND REINFORCED EARTH**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		3. The quantity of filler media shall be calculated as per approved design and specifications and shall be priced separately. The rate for same to be adopted from chapter 15.					
		4. Excavation for foundation including foundation concrete and groove in the foundation for seating of bottom most fascia panel and capping beam to be calculated as per design and priced separately. The rates for excavation and foundation concrete shall be taken from the chapter 12 & 13 in bridge section.					
		5. The earth fill to be retained is not included in this analysis. The same is to be worked out and provided separately complete as per clause 305.					
		6. For compaction of Earthwork, attention is invited to clause 3105.5 of MoRTH Specification.					
		7. Length of reinforcing strips will vary with the height of wall and will be as per approved design and drawings.					
		8. The type of reinforcing elements to be adopted shall be as per approved design and specifications.					
		9. The market rate for supply of reinforcing elements and their accessories are to be ascertained from reputed firms in the field of earth reinforcement.					
		10. The earth fill material shall be clean, free draining, granular with high friction and low cohesion, non-corrosive, coarse grained with not 10 per cent of particles passing 75 micron sieve, free of any deleterious matter, chlorides, salts, acids, alkalies, mineral oil, fungus and microbes and shall be of specified PH value.					
		11. Capping beam is to be priced separately as per approved design. The rate for cement concrete shall be taken from the chapter of sub-structure in bridge section.					
		12. The cost of reinforced earth retaining wall shall include following:					
		(i) Excavation for foundation including backfilling.					
		(ii) Foundation concrete as per approved design.					
		(iii) Cost of facial pannels and their erection .					
		(iv) Cost of reinforcing elements including their fixing and joining with the facial pannels.					
		(v) Drainage arrangement including filter media as per approved design and drawings.					
		13. The compacted earth filling to be retained shall form part of embankment.					

*Chas.*  
12/8/19





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## **CHAPTER–8**

# **TRAFFIC SIGNS, MARKING AND OTHER ROAD APPURTENANCES**

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## Chapter – 8

### Traffic signs, Markings and other Road Appurtenances

#### Preamble:

1. Rate analysis for fencing has been done for two different heights, i.e. 1.20 m and 1.80m. Any of these two can be adopted depending upon a particular situation and design.
2. Rate analysis for fencing provides for three types as under:
  - a) Barbed wire fencing
  - b) Welded steel wire fabric with mesh size of 75 x 25 mm
  - c) Welded steel wire fabric with mesh size of 75 x 50 mm
3. Kerbstone laying and road marking has been provided for laying by mechanical means.
4. Back filling of foundation of boundary pillars has been proposed with stone spalls, tightly packed and compacted.
5. The item pertaining to road traffic signals has not been analysed as this is a specialized work and rates can be obtained from firms having specialization for design and installation of this work.
6. For metal beam crash barrier, a 'W' shaped beams of size 311 x 83 mm flange width made with structural steel corrugated plate 3 mm thick and having a length of 4.5 m has been provided, over a channel post of 150 x 75 x 5 mm with a spacer of channel section 150 x 75 x 5 mm, 330 mm long.
7. Printing of letters and signs on item Nos. 18 to 21 is required to be measured and paid separately. A separate rate analysis for lettering has been prepared and included in this chapter for this purpose.
8. Two supports have been provided for direction and place identification signs where size is more than 0.9 sqm. Only one support is provided for size upto 0.9 sqm.
9. The traffic signs proposed are of retro- reflectorised type made of encapsulated lens type reflective sheeting fixed over aluminum sheeting as per Clause 801.3 and installation.
10. The size, location of traffic signs shall be as per IRC: 67.
11. The analysis for rigid, semi-rigid and flexible crash barriers has been included.
12. Provision has been made for a crane for installation of overhead signs.
13. Separate rate analysis has been made for Tubular steel railing with RCC posts and MS steel posts.
14. The organization and financial aspects are required to be finalized in consultation with administrative and traffic authorities.

*Chh.*  
12/8/17

15. The rate for the message display board for gantry mounted variable message sign is required to be ascertained from the market, this being a commercially produced item by specialized firms.
16. The rate analysis for traffic impact attenuators at abutments and piers has been included.
17. In the case of road signs and direction boards the depth of foundation and quantity of cement concrete provided in the rate analysis are indicative. These may be suitably increased in areas of higher wind velocities like coastal areas.
- 18. Ducts for Utility Services along and across the Expressway/Highway:**
- The running metre cost of duct along the road including inspection chambers (where applicable) or across the road will depend upon the approved design. The various item involved are earthen work, plain cement concrete, brick stone masonry, reinforcement cement concrete, form work, steel reinforcement, laying of pipe line (where duct is of pipe) and cast iron/RCC cover for the inspection chamber. The rate for these items are available under respective clauses which can be applied and running metre cost of duct worked out as per the approved design and drawing for particular situations. In case cast iron cover for the inspection chamber, the rate can be ascertained from the market for the size provided in the design and approved drawings.
- 19. Noise Barriers:**
- Noise barrier can be provided in the form of a brick wall of a suitable height as per the site requirement and approved design. The items involved for the construction of this barrier like earthwork, brick masonry, plain cement concrete etc. are available in the Data Book, which can be applied to arrive at the cost of noise barrier based on the design adopted.
- Alternatively, wherever space permits, cluster of trees, shrubs and plants can be grown by the road side 6 m away from the edge of the roadway. This will intercept the annoying sound waves and fumes from road vehicles.

*Chg.*  
12/8/19

# Summary of Rate Analysis

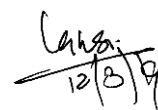
## CHAPTER - 8

### TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Item No.	Description	Unit	Rate (₹)
8.1	<b>Cast-in-Situ Cement Concrete M20 kerb</b> (Construction of cement concrete kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M-10 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408.)		
A	<b>Using Concrete Mixer</b>	metre	195.00
B	<b>Using Concrete Batching and Mixing Plant</b>	metre	208.00
8.2	<b>Cast in Situ Cement Concrete M 20 Kerb with Channel</b> (Construction of cement concrete kerb with channel with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M10 grade foundation 150 mm thick, kerb channel 300 mm wide, 50 mm thick in PCC M20 grade, sloped towards the kerb, kerb stone with channel laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408.)		
A	<b>Using Concrete Mixer</b>	metre	345.00
B	<b>Using Concrete Batching and Mixing Plant</b>	metre	367.00
8.3	<b>Printing new letter and figures of any shade</b> (Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade.)		
(i)	<b>Hindi</b> ( Matras commas and the like not to be measured and paid for Half letter shall be counted as half. )	cm height per letter	0.80
(ii)	<b>English and Roman</b>	cm height per letter	0.48
8.4	<b>Retro- reflectorised Traffic signs</b> (Providing and fixing of retro- reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of encapsulated lens type reflective sheeting vide clause 801.3, fixed over aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing.)		
( i )	<b>90 cm equilateral triangle</b>	each	4920.00
( ii )	<b>60 cm equilateral triangle</b>	each	3102.00
( iii )	<b>60 cm circular</b>	each	4292.00
( iv )	<b>80 mm x 60 mm rectangular</b>	each	6138.00
( v )	<b>60 cm x 45 cm rectangular</b>	each	4170.00
(vi )	<b>60 cm x 60 cm square</b>	each	5013.00
( vii )	<b>90 cm high octagon</b>	each	7937.00
8.5	<b>Direction and Place Identification signs upto 0.9 sqm size board.</b> (Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67 made of encapsulated lens type reflective sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick with area not exceeding 0.9 sqm supported on a mild steel single angle iron post 75 x 75 x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 x 45 x 60 cm, 60 cm below ground level as per approved drawing.)	sqm	11370.00
8.6	<b>Direction and Place Identification signs with size more than 0.9 sqm size board.</b> (Providing and erecting direction and place identification retro- reflectorised sign as per IRC :67 made of encapsulated lens type reflective sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick with area exceeding 0.9 sqm supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm, 2 Nos. firmly fixed to the ground by means of properly designed foundation with M 15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing.)	sqm	11702.00
8.7	<b>Overhead Signs</b> (Providing and erecting overhead signs with a corrosion resistant aluminium alloy sheet reflectorised with high intensity retro-reflective sheeting of encapsulated lense type with vertical and lateral clearance given in clause 802.2 and 802.3 and installed as per clause 802.7 over a designed support system of aluminium alloy or galvanised steel trestles and trusses of sections and type as per structural design requirements and approved plans.)		
A	<b>Truss and Vertical Support</b>	tonne	53503.00
B	<b>Aluminium alloy plate for over head sign</b>	tonne	10138.00
8.8	<b>Painting Two Coats on New Concrete Surfaces</b> (Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces)	sqm	66.00
8.9	<b>Painting on Steel Surfaces</b> (Providing and applying two coats of ready mix paint of approved brand on steel surface after through cleaning of surface to give an even shade)	sqm	57.80
8.1	<b>Painting on Wood Surfaces</b> (Providing and applying two coats of ready mix paint of approved brand on wood surface after through cleaning of surface to give an even shade)	sqm	65.00

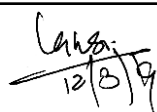
### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
<b>8.11</b>	<b>Painting Lines, Dashes, Arrows etc on Roads in Two Coats on New Work</b> (Painting lines, dashes, arrows etc on roads in two coats on new work with ready mixed road marking paint conforming to IS:164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control.)		
(i)	<b>Over 10 cm in width</b>	sqm	108.00
(ii)	<b>Up to 10 cm in width</b>	sqm	94.00
<b>8.12</b>	<b>Painting Lines, Dashes, Arrows etc on Roads in Two Coats on Old Work</b> (Painting lines, dashes, arrows etc on roads in two coats on old work with ready mixed road marking paint conforming to IS: 164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control. )		
(i)	<b>Over 10 cm in width</b>	sqm	74.00
(ii)	<b>Up to 10 cm in width</b>	sqm	79.00
<b>8.13</b>	<b>Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass Beads on Bituminous Surface</b> (Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes.)	sqm	735.00
<b>8.14</b>	<b>Kilo Metre Stone</b> (Reinforced cement concrete M15grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc.)		
(i)	<b>5th kilometre stone (precast)</b>	each	3052.00
(ii)	<b>Ordinary Kilometer stone (Precast)</b>	each	1775.00
(iii)	<b>Hectometer stone (Precast)</b>	each	539.00
<b>8.15</b>	<b>Road Delineators</b> (Supplying and installation of delineators (road way indicators, hazard markers, object markers), 80-100 cm high above ground level, painted black and white in 15 cm wide stripes, fitted with 80 x 100 mm rectangular or 75 mm dia circular reflectorised panels at the top, buried or pressed into the ground and conforming to IRC-79 and the drawings.)	each	1006.00
<b>8.16</b>	<b>Boundary pillar</b> (Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting.)	each	459.00
<b>8.17</b>	<b>G.I. Barbed wire Fencing 1.2 metre high</b> (Providing and fixing 1.2 metres high GI barbed wire fencing with 1.8 m angle iron posts 40 mm x 40 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 807.)	metre	248.00
<b>8.18</b>	<b>G.I. Barbed wire Fencing 1.8 metre high</b> (Providing and fixing 1.8 metres high GI barbed wire fencing with 2.4 m angle iron posts 50 mm x 50 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 12 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 807. )	metre	407.00
<b>8.19</b>	<b>Fencing with welded steel wire Fabric 75 mm x 50 mm (Suggestive)</b> (Providing 1.20 metre high fencing with angle iron posts 50 mm x 50 mm x 6 mm at 3 metre center to center with 0.40 metre embedded in M15 grade cement concrete, corner, end and every 10th post to be strutted, provided with welded steel wire fabric of 75 mm x 50 mm mesh or 75 mm x 25 mm mesh and fixed to iron posts by flat iron 50 x 5 mm and bolts etc. complete in all respects.)	metre	557.00
<b>8.20</b>	<b>Tubular Steel Railing on Medium Weight steel channel ( ISMC series) 100 mm x 50 mm</b> (Providing, fixing and erecting 50 mm dia steel pipe railing in 3 rows duly painted on medium weight steel channels (ISMC series) 100 mm x 50 mm, 1.2 metres high above ground, 2 m centre to centre, complete as per approved drawings.)	metre	1690.00
<b>8.21</b>	<b>Tubular Steel Railing on Precast RCC posts, 1.2 m high above ground level</b> (Providing, fencing and erecting 50 mm dia painted steel pipe railing in 3 rows on precast M20 grade RCC vertical posts 1.8 metres high (1.2 m above GL) with 3 holes 50 mm dia for pipe, fixed 2 metres centre to, complete as per approved drawing.)	metre	1258.00
<b>8.22</b>	<b>Reinforced Cement Concrete Crash Barrier</b> (Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-20 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MOST circular No. RW/NH - 33022/1/94-DO III dated 24 June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified.)		
(i)	<b>M 20 grade concrete</b>	metre	2850.00

  
 12/8/19

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
<b>8.23</b>	<b>Metal Beam Crash Barrier</b>		
<b>A</b>	<b>Type - A, "W" : Metal Beam Crash Barrier</b> (Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fittings to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810.)	metre	2651.00
<b>B</b>	<b>Type - B, "THRIE" : Metal Beam Crash Barrier</b> (Providing and erecting a "Thrie" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 85 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 2 m high with 1.15 m below ground level, all steel parts and fittings to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a space of channel section 150 x 75 x 5 mm, 546 mm long complete as per clause 810.)	metre	3332.00
<b>8.24</b>	<b>Road Traffic Signals electrically operated</b> (Since it is a ready made item commercially produced and erected by specialised firm in the electrical and electronic field, rate may be taken based on market enquiry from firms specialised in this field and ISI certified for the approved design and drawing.)		-
<b>8.25</b>	<b>Flexible Crash Barrier, Wire Rope Safety Barrier</b> (Providing and erecting a wire rope safety barrier with vertical posts of medium weight RS Joist (ISMB series) 100 mm x 75 mm (11.50 kg/m), 1.50 m long 0.85 m above ground and 0.65 m below ground level, split at the bottom for better grip, embedded in M 15 grade cement concrete 450 x 450 x 450 mm, 1.50 m center to center and with 4 horizontal steel wire rope 40 mm dia and anchored at terminal posts 15 m apart. Terminal post to be embedded in M 15 grade cement concrete foundation 2400 x 450 x 900 mm (depth), strengthened by a strut of RS joist 100 x 75 mm, 2 m long at 450 inclination and a tie 100 x 8 mm, 1.50 m long at the bottom, all embedded in foundation concrete as per approved design and drawing, rate excluding excavation and cement concrete.)	metre	1923.00
<b>8.26</b>	<b>Anti - Glare Devices in Median</b>		
<b>A</b>	<b>Plantation</b> (Plantation of shrubs and plants of approved species in the median. apart from cutting off glare from vehicle coming from opposite direction, these plants provide a pleasant environment and are eco-friendly. The rate for this item is available in the chapter 11 on horticulture. )		-
<b>B</b>	<b>Anti - Glare Screen with 25 mm steel pipe framework fixed with circular and rectangular vans</b> (Providing and erecting an anti - glare screen with 25 mm dia vertical pipes fabricated and framed in the form of panels of one metre length and 1.75 mtr height fixed with circular vane 250 mm dia at top and rectangular vane 600 x 300 mm at the middle, made out of steel sheet of 3 mm thickness, end vertical pipes of the panel made larger for embedding in foundation concrete, applying 2 coats of paint on all exposed surfaces, all as per approved design and drawings.)	metre	3058.00
<b>C</b>	<b>Anti - Glare Screen with Rectangular Vane of MS sheet</b> (Providing and erecting anti - glare screen with rectangular vanes of size 750 x 500 mm made from MS sheet, 3 mm thick and fixed on MS angle 50 x 50 x 6 mm at an angle of 450 to the direction of flow of traffic, 1.5 m center to center, top edge of the screen 1.75 m above ground level, vertical post firmly embedded in cement concrete foundation 0.60 m below ground level, applying 2 coats of paint on exposed faces, all complete as per approved design and drawings.)	metre	814.00
<b>8.27</b>	<b>Street Lighting</b> (Providing and erecting street light mounted on a steel circular hollow pole of standard specifications for street lighting, 9 m high spaced 40 m apart, 1.8 m overhang on both sides if fixed in the median and on one side if fixed on the footpath, fitted with sodium vapour lamp and fixed firmly in concrete foundation.)		
<b>(i)</b>	<b>For Fixing in Median</b>	each	#VALUE!
<b>(ii)</b>	<b>For fixing in Footpath</b>	each	#VALUE!
<b>8.28</b>	<b>Lighting on Bridges</b> (Providing and fixing lighting on bridges, mounted on steel hollow circular poles of standard specifications, 5 m high fixed on parapets with cement concrete, 20 m apart and fitted with sodium vapour lamp.)	each	#VALUE!
<b>8.29</b>	<b>Cable Duct Across the Road</b> (Providing and laying of a reinforced cement concrete pipe duct, 300 mm dia, across the road (new construction), extending from drain to drain in cuts and toe of slope to toe of slope in fills, constructing head walls at both ends, providing a minimum fill of granular material over top and sides of RCC pipe as per IRC: 98-1997, bedded on a 0.3 m thick layer of granular material free of rock pieces, outer to outer distance of pipe at least half dia of pipe subject to minimum 450 mm in case of double and triple row ducts, joints to be made leak proof, invert level of duct to be above higher than ground level to prevent entry of water and dirt, all as per IRC: 98 - 1997 and approved drawings.)		
<b>(i)</b>	<b>Single Row for one utility service</b>	metre	#VALUE!
<b>(ii)</b>	<b>Double Row for two utility services</b>	metre	#VALUE!
<b>(iii)</b>	<b>Triple Row for three utility services</b>	metre	#VALUE!





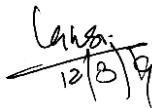
### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
8.3	<b>Highway Patrolling and Traffic Aid Post</b> (It is proposed to locate one Traffic Aid Post every 50-60 km of the highway. )		-
8.31	<b>Items related to under pass/ subway/ overhead bridge/ overhead foot bridge</b> (The items involved for underpass/ subway/ overhead bridge/ overhead foot bridge are earthwork, plain cement concrete, plastering, painting, information sign etc. The rates for these items are available in respective chapters which can be adopted for the quantities derived from the approved designs and drawings.)		-
8.32	<b>Traffic Control System and Communication system</b> (Providing a traffic control centre and communication system including telecommunication facilities and related accessories, CCTV, radar, vehicle detection camera, central computer system These are specialised item of telecommunication system and are the commercial products. The designer is required to contact the manufacturers to ascertain market prices. In case of civil works required to be executed for these installations, pricing may be done as per rates in relevant chapters for quantities derived approved design and drawing.)		-
8.33	<b>Gantry Mounted Variable Message Sign board</b> (Providing and erecting gantry mounted variable message sign board electronically operated capable of flashing the desired message over a designed support system of aluminium alloy or galvanised steel, erected as per approved design and drawings and with lateral clearance as per clause 802.3.)		
(i)	<b>Gantry Support System</b>	tonne	51064.00
(ii)	<b>Message Display</b> (Message display board 6 sqm electronically operated with complete electronic fittings for flashing the pre-determined messages.)		-
8.34	<b>Traffic Impact Attenuators at Abutments and Piers</b>		
A	<b>With Scrap Tyres</b> (Provision and installation of traffic attenuators at abutment/pier of flyovers bridges using scrap tyres of size 100 x 20 retrieved from trucks laid in 2 rows and 4 tiers, one above the other and tied with 20 mm wire rope as per approved design and drawings.)	sqm	847.00
B	<b>Using Plastic/Steel Barrel, Filled with Sand</b> (Provision and installation of traffic impact attenuator at abutment/pier of flyovers bridges using plastic/steel barrels 0.60 m dia and 1.0 m in height, filled with sand in three rows and tied with 20 mm steel wire rope as per approved design and drawings.)	sqm	590.00
C	<b>With HI - DRO cell Sandwich (Patented)</b> ((In this patented HI - DRO cell system, water gets discharged from plastic tubes on impact over a pre-determined time, thus absorbing the energy.)	sqm	#VALUE!
8.35	<b>Road Markers/Road Stud with Lense Reflector</b> (Providing and fixing of road stud 100x 100 mm, die cast in aluminium, resistant to corrosive effect of salt and grit, fitted with lense reflectors, installed in concrete or asphaltic surface by drilling hole 30 mm upto a depth of 60 mm and bedded in a suitable bituminous grout or epoxy mortar, all as per BS 873 part 4: 1973.)	each	218.00
8.36	<b>Traffic Cone</b> (Provision of red fluorescent with white reflective sleeve traffic cone made of low density polyethylene (LDPE) material with a square base of 390 x 390 x 35 mm and a height of 770 mm, 4 kg in weight, placed at 1.5 m interval, all as per BS 873.)	each	#VALUE!
8.37	<b>Roadside Amenities</b>		
A	<b>Rest Areas</b> (Providing plainly furnished accommodation for rest rooms, dormitories, restaurants, stalls, shops, petrol pump, telephone booth, first aid room, traffic aid post, police assistance booth, including electricity, toilet and sewerage system Pricing may be done based on current plinth area rates approved by PWD/CPWD/MES for a particular zone. Area is required to be assessed for specific location as per actual site conditions.)		-
B	<b>Parking areas and Bus Laybys for Trucks, Buses and Light vehicles</b> (Pricing of parking areas may be done for the quantities of various items based on the approved dimensions and pavement design for a particular terrain and soil. Rates for items may be from respective chapters.)		-
C	<b>Lawn</b> (Providing a lawn planted with grass and its maintenance. )		-
8.38	<b>Rumble Strips</b> (Provision of 15 nos rumble strips covered with premix bituminous carpet, 15-20 mm high at center, 250 mm wide placed at 1 m center to center at approved locations to control speed, marked with white strips of road marking paint.)	sqm	-
8.39	<b>Policeman Umbrella</b> (Provision of a 2 m high (floor to roof) umbrella for traffic policeman at road crossings, where necessary, installed on a raised platform, built on a central support of a steel pipe 100 mm dia, roof made of 25 mm dia steel pipe to provide covered area of 3 sqm, roofed with CGI sheets, all steel parts to be given 2 coats of paint.)	each	-

Calc.  
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### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
8.40	<b>High Mast Pole Lighting at Interchanges and Flyovers</b> (Providing and erecting a high mast pole lighting with 30 m high hot dip galvanised mast designed to withstand forces exerted with wind speeds of 180 km per hour with 3 seconds gust, as per IS:875 (Part 3) - 1978, fitted with a base flange, door at the base of mast with heavy duty internal lock, lantern carriage, suitable winching arrangement for safe working load of 750 kg and high powered electrically driven power tools for raising and lowering of lantern carriage, flexible 8 core electric cable, lightening conductor, earthing terminal, and fixing 2 nos aviation obstruction lights on top of the mast, all complete as per approved design and drawings This is a specialised work and is generally done by firms who specialise in such jobs. The detailed designs and estimates are submitted by the firms alongwith their tender for checks by the Department. The cost of this work is required to be worked out based on approved design, drawings and estimate of the lowest tender. A separate contract for this work is concluded as the contractors for road and bridge works generally donot undertake such jobs.)		-
8.41	<b>Toll Plaza</b> (The construction, operation and maintenance of Toll Plaza can be broken into separate items of work as under based on the approved design and drawings:-)		-
8.42	<b>Safety Devices and signs in Construction Zones</b> (Provision and fixing of traffic signs for limited period at suitable locations in construction zone comprising of warning zone, approach transition zone, working zone and terminal transition zone with a minimum distance of 60 cm from the edge of the kerb in case of kerbed roads and 2 to 3 m from the edge of the carriageway in case of un-kerbed roads, the bottom edge of the lowest sign plate to be not less than 2 m above the road level, fixed on 60 mm x 60 mm x 6 mm angle iron post, founded and installed as per approved design and drawings, removed and disposed of after completion of construction work, all as per IRC:SP:55-2001.)		-
8.43	<b>Portable Barricade in Construction Zone</b> (Installation of a steel portable barricade with horizontal rail 300 mm wide, 2.5 m in length fitted on a 'A' frame made with 45 x 45 x 5 mm angle iron section, 1.5 m in height, horizontal rail painted (2 coats) with yellow and white stripes, 150 mm in width at an angle of 45 deg., 'A' frame painted with 2 coats of yellow paint, complete as per IRC: SP : 55-2001.)	each	2649.00
8.44	<b>Permanent Type Barricade in Construction Zone</b>		
A	<b>With Steel Components</b> (Construction of a permanent type barricade made of steel components, 1.5 m high from road level, fitted with 3 horizontal rails 200 mm wide and 4 m long on 50 x 50 x 5 mm angle iron vertical support, painted with yellow and white strips, 150 mm in width at an angle of 45 deg., complete as per IRC:SP:55-2001.)	each	4163.00
B	<b>With Wooden Components</b> (Construction of a permanent type barricade made of wooden components, 1.5 m high from road level, fitted with 3 horizontal planks 200 mm wide and 3.66 m long on 100 x 100mm wooden vertical post, painted with yellow and white striups, 150 mm in width at an angle of 45 deg., complete as per IRC:SP:55-2001.)	each	9526.00
C	<b>With NORMAL Bricks</b> (Construction of a permanent type barricade made with brick work in mud mortar, 1.5 m high, 4 m long, 600 mm thick, plastered with cement mortar 1:6, painted with yellow and white strips.)	each	15669.00
	<b>With FLY ASH Bricks</b> (Construction of a permanent type barricade made with brick work in mud mortar, 1.5 m high, 4 m long, 600 mm thick, plastered with cement mortar 1:6, painted with yellow and white strips.)	each	13138.00
8.45	<b>Drum Delineator in Construction Zone</b> (Provision of metal drum/empty bitumen drum delineator, 300 mm in diameter, 800 mm high, filled with earth for stability, painted in circumferential strips of alternate black and white 100 mm wide fitted with reflectors 3 Nos of 7.5 cm dia, all as per IRC:SP:55-2001.)	each	451.00
8.46	<b>Flagman</b> (Positioning of a smart flagman with a yellow vest and a yellow cap and a red flag 600 x 600 mm securely fastened to a staff 1 m in length for guiding the traffic.)	each	402.00

  
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# Analysis of Rates

## CHAPTER - 8

### TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
8.1	408	<b>Cast-in-Situ Cement Concrete M20 Kerb</b>					
		Construction of cement concrete kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M-10 grade foundation 150 mm thick, foundation having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408					
		<b>Unit = Running metre</b>					
		<b>Taking output = 360 metre</b>					
	<b>A.</b>	<b>Using Concrete Mixer</b>					
		<b>Cement Concrete</b>					
		Cement concrete of grade M20 = 12.60 cum					
		Cement concrete of grade M10 for base = 11.61 cum					
		Total Concrete = <b>24.21 cu.m</b>					
		<b>a) Labour</b>					
		Mate	day	0.720	272.00	195.84	L-12
		Mason	day	2.000	345.00	690.00	L-11
		Mazdoor	day	16.000	257.00	4112.00	L-13
		<b>b) Machinery</b>					
		Kerb casting machine @ 60 metres/hour	hour	6.000	467.00	2802.00	P&M-029
		Concrete mixer 0.48/0.28 cum capacity	hour	12.000	82.30	987.60	P&M-009
		Water tanker 6 KL capacity	hour	5.000	183.00	915.00	P&M-060
		<b>c) Material</b>					
		Crushed stone aggregate 20 mm nominal size 59 per cent	cum	21.790	550.85	12003.02	M-053
		Coarse sand 30 per cent	cum	10.900	150.80	1643.72	M-005
		Cement 11 per cent	tonne	5.700	5156.00	29389.20	M-081
		Cost of water	KL	30.000	253.69	7610.70	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				3620.94	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				6397.00	
		Cost for 360 meter = a+b+c+d+e				70367.03	
		<b>Rate per metre = (a+b+c+d+e)/360</b>				195.46	
					<b>say</b>	<b>195.00</b>	
	<b>B</b>	<b>Using Concrete Batching and Mixing Plant</b>					
		<b>Cement Concrete</b>					
		Cement concrete of grade M20 = 12.60 cum					
		Cement concrete of grade M10 for base = 11.61 cum					
		Total Concrete = <b>24.21 cu.m</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Mason	day	1.000	345.00	345.00	L-11
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Kerb casting machine @ 60 metres/hour	hour	6.000	467.00	2802.00	P&M-029
		Concrete batching and mixing plant @ 15 cum/hr.	hour	1.600	1853.00	2964.80	P&M-003
		Water tanker 6 KL capacity	hour	5.000	183.00	915.00	P&M-060
		Tipper 5.5 cum capacity	hour	6.000	1018.00	6108.00	P&M-048
		<b>c) Material</b>					
		Crushed stone aggregate 20 mm nominal size 59 per cent	cum	21.790	550.85	12003.02	M-053
		Coarse sand 30 per cent	cum	10.900	150.80	1643.72	M-004
		Cement 11 per cent	tonne	5.700	5156.00	29389.20	M-081
		Cost of water	KL	30.000	253.69	7610.70	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				3859.68	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				6818.78	
		Cost for 360 meter = a+b+c+d+e				75006.54	
		<b>Rate per metre = (a+b+c+d+e)/360</b>				208.35	
					<b>say</b>	<b>208.00</b>	
8.2	408	<b>Cast in Situ Cement Concrete M 20 Kerb with Channel</b>					
		Construction of cement concrete kerb with channel with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M10 grade foundation 150 mm thick, kerb channel 300 mm wide, 50 mm thick in PCCM20 grade, sloped towards the kerb, kerb stone with channel laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408					
	<b>A</b>	<b>Using Concrete Mixer</b>					

Analysis of Rates  
**TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Unit = Running metre</b>					
		<b>Taking output = 300 metre length</b>					
		<b>Cement Concrete</b>					
		Cement concrete of grade M20= 17.48 cum					
		Cement concrete of grade M10 for base = 23.18 cum					
		Total Concrete = <b>40.66 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.720	272.00	195.84	L-12
		Mason	day	2.000	345.00	690.00	L-11
		Mazdoor	day	16.000	257.00	4112.00	L-13
		<b>b) Machinery</b>					
		Kerb casting machine @ 50 metres/hour for laying kerb and channel	hour	6.000	467.00	2802.00	P&M-029
		Concrete mixer 0.48/0.28	hour	16.000	82.30	1316.80	P&M-009
		Water tanker 6 KL capacity	hour	6.000	183.00	1098.00	P&M-060
		<b>c) Material</b>					
		Crushed stone aggregate 20 mm nominal size 60 per cent	cum	36.590	550.85	20155.60	M-053
		Coarse sand 30 per cent	cum	18.300	150.80	2759.64	M-005
		Cement 10 per cent	tonne	9.010	5156.00	46455.56	M-081
		Cost of water	KL	36.000	253.69	9132.84	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				5323.10	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				9404.14	
		Cost for 300 metre = a+b+c+d+e				103445.52	
		<b>Rate per metre = (a+b+c+d+e)/300</b>				344.82	
					<b>say</b>	<b>345.00</b>	
8.2	B	<b>Using Concrete Batching and Mixing Plant</b>					
		<b>Unit = Running metre</b>					
		<b>Taking output = 300 metre length</b>					
		<b>Cement Concrete</b>					
		Cement concrete of grade M20= 17.48 cum					
		Cement concrete of grade M10 for base = 23.18 cum					
		Total Concrete = <b>40.66 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Mason	day	1.000	345.00	345.00	L-11
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Kerb casting machine @ 50 metres/hour for laying kerb and channel	hour	6.000	467.00	2802.00	P&M-029
		Concrete batching and mixing plant @ 15 cum/hr.	hour	2.700	1853.00	5003.10	P&M-003
		Water tanker 6 KL capacity	hour	6.000	183.00	1098.00	P&M-060
		Tipper of 5.5 cum capacity	hour	6.000	1018.00	6108.00	P&M-048
		<b>c) Material</b>					
		Crushed stone aggregate 20 mm nominal size 60 per cent	cum	36.590	550.85	20155.60	M-053
		Coarse sand 30 per cent	cum	18.300	150.80	2759.64	M-004
		Cement 10 per cent	tonne	9.010	5156.00	46455.56	M-081
		Cost of water	KL	36.000	253.69	9132.84	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				5664.38	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				10007.08	
		Cost for 300 meter = a+b+c+d+e				110077.84	
		<b>Rate per metre = (a+b+c+d+e)/300</b>				366.93	
					<b>say</b>	<b>367.00</b>	
8.3	801	<b>Printing New Letter and Figures of any Shade</b>					
		Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade					

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Analysis of Rates  
**TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
	(i)	<b>Hindi</b> ( Matras commas and the like not to be measured and paid for Half letter shall be counted as half )					
		<b>Details for 100 letters of 16 cm height i.e. 1600 cm</b>					
		<b>Unit = per cm height per letter</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Painter	day	2.000	326.00	652.00	L-18
		Mazdoor	day	1.000	257.00	257.00	L-13
		<b>b) Material</b>					
		Paint	Litre	0.700	219.05	153.34	M-131
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				65.70	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				116.07	
		Cost for 1600 cm = a+b+c+d				1276.74	
		<b>Rate per cm height per letter = (a+b+c+ d)/1600</b>				0.80	
					<b>say</b>	<b>0.80</b>	
8.3	(ii)	<b>English and Roman</b>					
		Hyphens and the like not to be measured and paid for					
		Detail for 100 letters of 16 cm height. i.e.1600 cm					
		Unit = per cm height per letter					
		<b>a) Labour</b>					
		Mate	day	0.070	272.00	19.04	L-12
		Painter Ist class	day	1.250	326.00	407.50	L-18
		Mazdoor	day	0.500	257.00	128.50	L-13
		<b>b) Material</b>					
		Paint	Litre	0.500	219.05	109.53	M-131
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				39.87	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				70.44	
		Cost for 1600 cm = a+b+c+d				774.88	
		<b>Rate per cm height per letter = (a+b+c +d)/1600</b>				0.48	
					<b>say</b>	<b>0.48</b>	
8.4	801	<b>Retro-Reflectorised Traffic Signs</b>					
		Providing and fixing of retro- reflectorised cautionary, mandatory and informatory sign as per IRC :67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing					
		<b>Unit = Each</b>					
		<b>Taking output = one traffic sign</b>					
		<b>i) Excavation for foundation</b>	cum	0.216	250.00	54.00	Item No. 3.13 A
		<b>ii) Cement concrete M15 grade</b>	cum	0.120	3848.00	461.76	Item 12.8 (A)
		<b>iii) Painting angle iron post two coats</b>	sqm	0.430	57.80	24.85	Item 8.9
		<b>a) Labour (For fixing at site)</b>					
		Mate	day	0.010	272.00	2.72	L-12
		Mazdoor	day	0.250	257.00	64.25	L-13
		<b>b) Material</b>					
		Mild steel angle iron 75 x 75 x 6 mm	kg	19.000	44.927	853.613	M-179 /1000
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size including lettering and signs as applicable					
		Add 2 per cent of cost of angle iron towards cost of drilling holes, nuts, bolts etc.				17.07	
	( i )	90 cm equilateral triangle	sqm	0.350	8035.86	2812.55	M-061
		or					
	( ii )	60 cm equilateral triangle	sqm	0.156	8035.86	1253.59	M-061
		or					
	( iii )	60 cm circular	sqm	0.283	8035.86	2274.15	M-061

Analysis of Rates  
**TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		or					
	(iv)	80 mm x 60 mm rectangular	sqm	0.480	8035.86	3857.21	M-061
		or					
	(v)	60 cm x 45 cm rectangular	sqm	0.270	8035.86	2169.68	M-061
		or					
	(vi)	60 cm x 60 cm square	sqm	0.360	8035.86	2892.91	M-061
		or					
	(vii)	90 cm high octagon	sqm	0.672	8035.86	5400.10	M-061
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.010	546.00	5.46	P&M-053
	(i)	90 cm equilateral triangle					
		d) Overhead charges @ 0.06 on (a+b+c)				225.34	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				398.10	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				4919.72	
					say	<u>4920.00</u>	
	(ii)	60 cm equilateral triangle					
		d) Overhead charges @ 0.06 on (a+b+c)				131.80	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				232.85	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				3101.97	
					say	<u>3102.00</u>	
	(iii)	60 cm circular					
		d) Overhead charges @ 0.06 on (a+b+c)				193.04	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				341.03	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				4291.94	
					say	<u>4292.00</u>	
	(iv)	80 mm x 60 mm rectangular					
		d) Overhead charges @ 0.06 on (a+b+c)				288.02	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				508.83	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				6137.79	
					say	<u>6138.00</u>	
	(v)	60 cm x 45 cm rectangular					
		d) Overhead charges @ 0.06 on (a+b+c)				186.77	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				329.96	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				4170.13	
					say	<u>4170.00</u>	
	(vi)	60 cm x 60 cm square					
		d) Overhead charges @ 0.06 on (a+b+c)				230.16	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				406.62	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				5013.42	
					say	<u>5013.00</u>	
	(vii)	90 cm high octagon					
		d) Overhead charges @ 0.06 on (a+b+c)				380.59	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				672.38	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				7936.80	
					say	<u>7937.00</u>	
	Note	1.Any one area of aluminium sheeting given at (i) to (vii) may be adopted as per site requirement and in accordance with IRC : 67					
		2.Rate for excavation, cement concrete M-15 and painting may be taken from respective chapters					
		3. The depth of foundation and quantity of cement concrete in the foundation are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.					
8.5	801	Direction and Place Identification Signs upto 0.9 sqm Size Board.					

Analysis of Rates  
**TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick with area not exceeding 0.9 sqm supported on a mild steel single angle iron post 75 x 75 x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 x 45 x 60 cm, 60 cm below ground level as per approved drawing					
		<b>Unit = sqm</b>					
		<b>Taking output = 0.9 sqm</b>					
		i) Excavation for foundation	cum	0.216	250.00	54.00	Item No. 3.13 A
		ii) Cement concrete M15 grade	cum	0.120	3848.00	461.76	Item 12.8 (A)
		iii) Painting angle iron post two coats	sqm	0.430	57.80	24.85	Item 8.9
		a) Labour (For fixing at site)					
		Mate	day	0.010	272.00	2.72	L-12
		Mazdoor	day	0.200	257.00	51.40	L-13
		b) Material					
		Mild steel angle iron 75 mm x 75 mm x 6 mm, 2.85 metres long	kg	19.000	44.927	853.61	M-179 /1000
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size 0.9 sqm	sqm	0.900	8035.86	7232.27	M-061
		Add 2 per cent of cost of materials for drilling holes, nuts, bolts, fabrication etc.				161.72	
		c) Machinery					
		Tractor-trolley	hour	0.020	546.00	10.92	P&M-053
		d) Overhead charges @ 0.06 on (a+b+c)				498.76	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				881.14	
		Cost for 0.9 sqm = i+ii+iii+ a+b+c+d+e				10233.16	
		<b>Rate per sqm (for sign having area upto 0.9 sqm) = (i+ii+iii+a+b+c+d+e)/0.90</b>				11370.18	
					<b>say</b>	<b>11370.00</b>	
		<b>Note</b> i) Lettering and arrow marks on sign board to be provided separately as per actual requirement. Rates for these items have been analysed separately					
		ii) Rate for excavation, cement concrete M-15 and painting may be taken from respective chapters					
8.6	801	<b>Direction and Place Identification Signs with size more than 0.9 sqm size Board.</b>					
		Providing and erecting direction and place identification retro-reflectorised sign as per IRC :67 made of high intensity grade sheeting vide clause 801.3, fixed over aluminium sheeting, 2 mm thick with area exceeding 0.9 sqm supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm, 2 Nos. firmly fixed to the ground by means of properly designed foundation with M 15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing					
		<b>Unit = sqm</b>					
		<b>Taking output = 1.50 sqm</b>					
		i) Excavation for foundation	cum	0.430	250.00	107.50	Item No. 3.13 A
		ii) Cement concrete M15 grade	cum	0.240	3848.00	923.52	Item 12.8 (A)
		iii) Painting angle iron post 2 coats	sqm	0.860	57.80	49.71	Item 8.9
		a) Labour (For fixing at site)					
		Mate	day	0.010	272.00	2.72	L-12
		Mazdoor	day	0.300	257.00	77.10	L-13
		b) Material					
		Mild steel angle iron 75 mm x 75 mm x 6 mm, 2.85 metres long, 2 nos	kg	38.000	44.927	1707.23	M-179 /1000
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting	sqm	1.500	8035.86	12053.79	M-061



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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Add 2 per cent of cost of materials for drilling holes, nuts, bolts, fabrication etc.				275.22	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.020	546.00	10.92	P&M-053
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				847.62	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1497.46	
		Cost for 1.5 sqm = i+ii+iii+ a+b+c+d+e				17552.78	
		<b>Rate per sqm ( for sign having area more than 0.9 sqm) = ( i+ii+iii+a+b+c+d+e)/1.50</b>				11701.85	
					say	<b>11702.00</b>	
		<b>Note</b> i) Lettering and arrow marks on sign board to be provided separately as per actual requirement. Rates for these items have been analysed separately					
		ii) Rate for excavation, cement concrete M-15 and painting may be taken from respective chapters					
8.7	802	<b>Overhead Signs</b>					
		Providing and erecting overhead signs with a corrosion resistant 2mm thick aluminium alloy sheet reflectorised with high intensity retro-reflective sheeting of encapsulated lense type with vertical and lateral clearance given in clause 802.2 and 802.3 and installed as per clause 802.7 over a designed support system of aluminium alloy or galvanised steel trestles and trusses of sections and type as per structural design requirements and approved plans					
		<b>A Truss and Vertical Support</b>					
		<b>Unit = tonne</b>					
		<b>Taking output = 1 tonne</b>					
		<b>a) Labour</b>					
		Mate	day	0.240	272.00	65.28	L-12
		Blacksmith	day	2.000	345.00	690.00	L-02a
		Mazdoor including for handling & fixing at site.	day	4.000	257.00	1028.00	L-13
		<b>b) Material</b>					
		Aluminium alloy/galvanised steel including 5 per cent wastage	tonne	1.050	34460.81	36183.85	M-060
		Add 1 per cent on cost of material for nuts, bolts and drilling and welding consumables				361.84	
		Add 15 per cent on cost of material for fabrication of trusses as per approved design				5481.85	
		<b>c) Machinery</b>					
		Crane 3 tonne capacity	hour	3.000	537.00	1611.00	P&M-013
		Truck	hour	0.500	929.00	464.50	P&M-057
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				2753.18	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				4863.95	
		<b>Rate per tonne = (a+b+c+d+e)</b>				53503.45	
					say	<b>53503.00</b>	
8.7		<b>B Aluminium Alloy Plate for Over Head Sign</b>					
		<b>Unit = sqm</b>					
		<b>Taking output = 1 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.020	272.00	5.44	L-12
		Blacksmith	day	0.100	345.00	34.50	L-02a
		Mazdoor	day	0.150	257.00	38.55	L-13
		<b>b) Material</b>					
		Aluminium alloy plate, 2 mm thick, fixed with high intensity grade sheeting vide clause 801.3	sqm	1.000	8615.21	8615.21	M-059
		<b>Miscellaneous</b>					
		Add 1 per cent of cost of labour for lifting arrangement, like ladders, pulleys, ropes etc				0.78	
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				521.67	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				921.62	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Rate per sqm = (a+b+c+d)</b>				10137.77	
					<b>say</b>	<b>10138.00</b>	
		<b>Note</b>					
		1. The cost of excavation and foundation concrete for fixing of vertical support system to be worked out separately as per the approved drawing/design and to be included in the estimate.					
		2. Lettering and arrow marks on sign board to be provided separately as per actual requirement. Rates for these items have been included separately in this chapter.					
<b>8.8</b>	<b>803</b>	<b>Painting Two Coats on New Concrete Surfaces</b>					
		Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces					
		<b>Unit = sqm</b>					
		<b>Taking output = 40 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Painter	day	2.000	326.00	652.00	L-18
		Mazdoor	day	1.000	257.00	257.00	L-13
		<b>b) Material</b>					
		Paint conforming to requirement of clause 803.3.	Litre	6.000	219.05	1314.30	M-132
		Add for scaffolding @ 1 percent of labour cost where required				9.42	
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				135.92	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				240.13	
		Cost for 40 sqm = a+b+c+d				2641.41	
		<b>Rate per sqm = (a+b+c+d)/40</b>				66.04	
					<b>say</b>	<b>66.00</b>	
<b>8.9</b>	<b>803</b>	<b>Painting on Steel Surfaces</b>					
		Providing and applying two coats of ready mix paint of approved brand on steel surface after through cleaning of surface to give an even shade					
		<b>Unit = sqm</b>					
		<b>Taking output = 10 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.030	272.00	8.16	L-12
		Painter	day	0.450	326.00	146.70	L-18
		Mazdoor	day	0.250	257.00	64.25	L-13
		<b>b) Material</b>					
		Paint ready mixed approved brand.	Litre	1.250	219.05	273.81	M-131
		Add @ 1 per cent on cost of material for scaffolding				2.74	
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				29.74	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				52.54	
		Cost for 10 sqm = a+b+c+d				577.94	
		<b>Rate per sqm = (a+b+c+d)/10</b>				57.79	
					<b>say</b>	<b>57.80</b>	
<b>8.10</b>	<b>803</b>	<b>Painting on Wood Surfaces</b>					
		Providing and applying two coats of ready mix paint of approved brand on wood surface after thorough cleaning of surface to give an even shade					
		<b>Unit = sqm</b>					
		<b>Taking output = 10 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.030	272.00	8.16	L-12
		Painter	day	0.500	326.00	163.00	L-18
		Mazdoor	day	0.200	257.00	51.40	L-13
		<b>b) Material</b>					
		Paint ready mixed of approved brand.	Litre	1.500	219.05	328.58	M-131
		Add @ 1 per cent on cost of material for scaffolding				3.29	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		c) Overhead charges @ 0.06 on (a+b)				33.27	
		d) Contractor's profit @ 0.1 on (a+b+c)				58.77	
		Cost for 10 sqm = a+b+c+d				646.45	
		Rate per sqm = (a+b+c+d)/10				64.65	
					say	<b>65.00</b>	
8.11	803	<b>Painting Lines, Dashes, Arrows etc on Roads in Two Coats on New Work</b>					
		Painting lines, dashes, arrows etc on roads in two coats on new work with ready mixed road marking paint conforming to IS:164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control					
		(i) Over 10 cm in width					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.090	272.00	24.48	L-12
		Painter	day	0.550	326.00	179.30	L-18
		Mazdoor	day	1.550	257.00	398.35	L-13
		b) Material					
		Road marking Paint as per IS :164	Litre	1.480	219.05	324.19	M-132
		c) Overhead charges @ 0.06 on (a+b)				55.58	
		d) Contractor's profit @ 0.1 on (a+b+c)				98.19	
		Cost for 10 sqm = a+b+c+d				1080.09	
		Rate per sqm = (a+b+c+d)/10				108.01	
					say	<b>108.00</b>	
8.11		(ii) Up to 10 cm in width					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.070	272.00	19.04	L-12
		Painter	day	0.350	326.00	114.10	L-18
		Mazdoor	day	1.350	257.00	346.95	L-13
		b) Material					
		Road marking paint	Litre	1.480	219.05	324.19	M-132
		c) Overhead charges @ 0.06 on (a+b)				48.26	
		d) Contractor's profit @ 0.1 on (a+b+c)				85.25	
		Cost for 10 sqm = a+b+c+d				937.80	
		Rate per sqm = (a+b+c+d)/10				93.78	
					say	<b>94.00</b>	
8.12	803	<b>Painting Lines, Dashes, Arrows etc on Roads in Two Coats on Old Work</b>					
		Painting lines, dashes, arrows etc on roads in two coats on old work with ready mixed road marking paint conforming to IS: 164 on bituminous surface, including cleaning the surface of all dirt, dust and other foreign matter, demarcation at site and traffic control					
		(i) Over 10 cm in width					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.060	272.00	16.32	L-12
		Painter Ist class	day	0.300	326.00	97.80	L-18
		Mazdoor	day	1.250	257.00	321.25	L-13
		b) Material					
		Road marking paint	Litre	0.900	219.05	197.15	M-132
		c) Overhead charges @ 0.06 on (a+b)				37.95	
		d) Contractor's profit @ 0.1 on (a+b+c)				67.05	

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Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Cost for 10 sqm = a+b+c+d				737.51	
			Rate per sqm = (a+b+c+d)/10				73.75	
						say	<u>74.00</u>	
8.12		(ii)	Up to 10 cm in width					
			Unit = sqm					
			Taking output = 10 sqm					
			a) Labour					
			Mate	day	0.070	272.00	19.04	L-12
			Painter Ist class	day	0.350	326.00	114.10	L-18
			Mazdoor	day	1.350	257.00	346.95	L-13
			b) Material					
			Road marking Paint	Litre	0.900	219.05	197.15	M-132
			c) Overhead charges @ 0.06 on (a+b)				40.63	
			d) Contractor's profit @ 0.1 on (a+b+c)				71.79	
			Cost for 10 sqm = a+b+c+d				789.66	
			Rate per sqm = (a+b+c+d)/10				78.97	
						say	<u>79.00</u>	
8.13	803		Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass Beads on Bituminous Surface					
			Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35. The finished surface to be level, uniform and free from streaks and holes.					
			Unit = sqm					
			Taking output = 640 sqm					
			a) Labour					
			Mate	day	0.500	272.00	136.00	L-12
			Mazdoor	day	2.000	257.00	514.00	L-13
			b) Machinery					
			Road marking machine @ 80 sqm per hour	hour	8.000	141.00	1128.00	P&M-043
			Tractor-trolley	hour	8.000	546.00	4368.00	P&M-053
			c) Material					
			Hot applied thermoplastic compound	Litre	2000.000	192.38	384760.00	M-118
			Reflectorising glass beads	kg	200.000	63.57	12714.00	M-152
			d) Overhead charges @ 0.06 on (a+b+c)				24217.20	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				42783.72	
			Cost for 640 sqm = a+b+c+d+e				470620.92	
			Rate per sqm = a+b+c+d+e)/640				735.35	
						say	<u>735.00</u>	
		Note	1. A sealing primer may be applied in advance on cement concrete pavement to ensure proper bonding. Any laitance and/or curing compound to be removed where paint is required to be applied on concrete surface.					
			2. Cost of painter is already included in hire charges of road marking machine.					
8.14	804		Kilometre Stone					
			Reinforced cement concrete M15 grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc					
		(i)	5th kilometre stone (precast)					
			Unit = Nos.					
			Taking output = 6 Nos.					
			a) M-15 grade of concrete	cum	2.350	3848.00	9042.80	Item 12.8 (A)
			b) Steel reinforcement @ 5 kg per sqm	kg	22.080	63.203	1395.52	Item 13.6 /1000
			c) Excavation in soil for foundation	cum	1.680	250.00	420.00	Item No. 3.13 A

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		d) Painting two coats on concrete surface	sqm	9.850	66.00	650.10	Item 8.8
		e) Lettering on km post (average 30 letters of 10 cm height each)	per cm per letter	1800.000	0.48	864.00	Item 8.3(ii)
		Transportation and fixing					
		f) Labour					
		Mate	day	0.260	272.00	70.72	L-12
		Mason	day	0.600	345.00	207.00	L-11
		Mazdoor including loading/unloading	day	6.000	257.00	1542.00	L-13
		g) Machinery					
		Tractor-trolley	hour	6.000	546.00	3276.00	P&M-053
		h) Overhead charges @ 0.06 on (f+g)				305.74	
		i) Contractor's profit @ 0.1 on (f+g+h)				540.15	
		Cost for 6 Nos. 5th km stone = a+b+c+ d+e +f+g+h +i				18314.03	
		Rate for each 5th km stone = (a+b+c+d+e+f+g+h+i)/ 6				3052.34	
					say	<u>3052.00</u>	
8.14	(ii)	Ordinary kilometer stone (precast)					
		Unit = Nos.					
		Taking output = 14 Nos.					
		a) M-15 grade of concrete	cum	3.770	3848.00	14506.96	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	26.320	63.203	1663.50	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	2.770	250.00	692.50	Item No. 3.13 A
		d) Painting two coats on concrete surface	sqm	11.410	66.00	753.06	Item 8.8
		e) Lettering on km post ( average 12 letters of 10 cm height each)	per cm per letter	1680.000	0.48	806.40	Item 8.3(ii)
		Transportation and fixing					
		f) Labour					
		Mate	day	0.320	272.00	87.04	L-12
		Mason	day	1.000	345.00	345.00	L-11
		Mazdoor	day	7.000	257.00	1799.00	L-13
		g) Machinery					
		Tractor-trolley	hour	6.000	546.00	3276.00	P&M-053
		h) Overhead charges @ 0.06 on (f+g)				330.42	
		i) Contractor's profit @ 0.1 on (f+g+h)				583.75	
		Cost for 14 Nos. ordinary km stone = (a+b+ c+d+e+f+g+h+i)				24843.63	
		Rate for each ordinary km stone = (a+b+ c+d+e+f+g+h+i) /14				1774.55	
					say	<u>1775.00</u>	
8.14	(iii)	Hectometer stone (precast)					
		Unit = Nos.					
		Taking output = 33 Nos.					
		a) M-15 grade of concrete	cum	1.580	3848.00	6079.84	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	66.000	63.203	4171.40	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	1.390	250.00	347.50	Item No. 3.13 A
		d) Painting two coats on concrete surface	sqm	6.270	66.00	413.82	Item 8.8
		e) Lettering on km post (average 1 letter of 10 cm height each)	per cm per letter	330.000	0.48	158.40	Item 8.3(ii)
		Transportation and fixing					
		f) Labour					
		Mate	day	0.340	272.00	92.48	L-12
		Mason	day	1.500	345.00	517.50	L-11
		Mazdoor	day	7.000	257.00	1799.00	L-13
		g) Machinery					
		Tractor-trolley	hour	6.000	546.00	3276.00	P&M-053
		h) Overhead charges @ 0.06 on (f+g)				341.10	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		i) <b>Contractor's profit @ 0.1 on (f+g+h)</b>				602.61	
		Cost for 33 Nos. Hectometer stone = (a+b+c+d+e+f+ g+h+i)				17799.64	
		<b>Rate for each Hectometer stone = (a+b +c +d+e+f+ g+h+i) / 33</b>				539.38	
					say	<b>539.00</b>	
		<b>Note</b> The rate for excavation, cement concrete, steel reinforcement, painting and lettering may be taken from respective chapters.					
8.15	805	<b>Road Delineators</b>					
		Supplying and installation of delineators (Road way indicators, hazard markers, object markers), 80-100 cm high above ground level, painted black and white in 15 cm wide strips, fitted with 80 x 100 mm rectangular or 75 mm dia circular reflectorised panels at the top, buried or pressed into the ground and conforming to IRC-79 and the drawings.					
		<b>Unit = Each</b>					
		Taking output= 30 Nos.					
		<b>a) Labour</b>					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor for fixing	day	1.000	257.00	257.00	L-13
		<b>b) Material</b>					
		Cost of approved type of delineators from ISI certified firm as per the standard drawing given in IRC - 79	each	30.000	776.17	23285.10	M-091
		Add 10 per cent cost of material for installation				2328.51	
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				1552.89	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2743.44	
		Cost for 30 Nos. delineators = (a+b+ c+d)				30177.82	
		<b>Rate per delineators = (a+b+c+d) /30</b>				1005.93	
					say	<b>1006.00</b>	
		<b>Note</b> In case of soft ground, a proper foundation may be provided as per approved design. In case foundation is required to be provided, the items of excavation and foundation concrete are required to be measured and paid separately.					
8.16	806	<b>Boundary pillar</b>					
		Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting					
		<b>Unit = Each</b>					
		Taking output = 57 Nos.					
		<b>a) M-15 grade of the boundary stone</b>	cum	1.250	3848.00	4810.00	Item 12.8 (A)
		<b>b) Steel reinforcement</b>	kg	79.800	63.203	5043.60	Item 13.6 /1000
		<b>c) Excavation in soil</b>	cum	10.720	250.00	2680.00	Item No. 3.13 A
		<b>d) Lettering, each 10 cm high</b>	per letter per cm high	2280.000	0.48	1094.40	Item 8.3(ii)
		<b>Transportation and fixing</b>					
		<b>e) Labour</b>					
		Mate	day	0.570	272.00	155.04	L-12
		Mazdoor	day	14.250	257.00	3662.25	L-13
		<b>f) Machinery</b>					
		Tractor-trolley	hour	6.000	546.00	3276.00	P&M-053
		<b>g) Material</b>					
		Stone spall	cum	11.970	303.85	3637.08	M-008
		<b>h) Overhead charges @ 0.06 on (e+f+g)</b>				643.82	
		<b>i) Contractor's profit @ 0.1 on (e+f+g+h)</b>				1137.42	
		Cost for 57 Nos. boundary pillar = (a+b +c+d +e+ f+g+h+i )				26139.62	
		<b>Rate for each boundary pillar = (a+b+c+d+e+ f+g+h+i)/57</b>				458.59	
					say	<b>459.00</b>	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Note</b> In case of soft ground, a proper foundation may be provided as per approved design. In case foundation is required to be provided, the items of excavation and foundation concrete are required to be measured and paid separately.					
8.17	807	<b>G.I Barbed Wire Fencing 1.2 Metre High</b>					
		Providing and fixing 1.2 metres high GI barbed wire fencing with 1.8 m angle iron posts 40 mm x 40 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 807					
		<b>Unit = per running metre</b>					
		Taking output = 30 metres					
		<b>a) Labour</b>					
		Mate	day	0.090	272.00	24.48	L-12
		Blacksmith	day	0.250	345.00	86.25	L-02a
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Material</b>					
		Barbed wire 335 metres length @ 9.38 kg per 100 metres	kg	31.420	61.21	1923.22	M-063
		MS angle iron 40 mm x 40mm x 6 mm, 23 metres in length @ 3.5 kg per metre	kg	80.500	44.927	3616.62	M-179 /1000
		Add for GI staple binding wire, drilling holes etc. @ 2 per cent of the cost of material				110.80	
		<b>c) Painting</b>					
		Applying two coats of painting on exposed surface of angle iron posts ( Rate as per item no. 8.9)	sqm	2.110	57.80	121.96	Item 8.9
		<b>d) Overhead charges @ 0.06 on (a+b)</b>				376.52	
		<b>e) Contractor's profit @ 0.1 on (a+b+d)</b>				665.19	
		Cost for 30 metres fencing = a+b+c+d+e				7439.04	
		<b>Rate per metre = (a+b+c+d+e)/30</b>				247.97	
					<b>say</b>	<b>248.00</b>	
		<b>Note</b> Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design. The rate for these items may be taken from respective chapters.					
8.18	807	<b>G.I Barbed Wire Fencing 1.8 Metre High</b>					
		Providing and fixing 1.8 metres high GI barbed wire fencing with 2.4 m angle iron posts 50 mm x 50 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 12 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 807					
		<b>Unit = per running metre</b>					
		Taking output = 30 metres					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Blacksmith	day	0.400	345.00	138.00	L-02a
		Mazdoor	day	2.500	257.00	642.50	L-13
		<b>b) Material</b>					
		Barbed wire 428 metres length @ 9.38 kg per 100 metres	kg	40.150	61.21	2457.58	M-063
		MS angle iron 50 mm x 50 mm x 6 mm, 33.8 metres in length @ 4.5 kg per metre	kg	152.000	44.927	6828.90	M-179 /1000
		Add for GI staple, binding wire, drilling holes etc. @ 2 per cent of the cost of material				185.73	
		<b>c) Painting</b>					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Applying two coats of painting on exposed surface of angle iron posts	sqm	3.960	57.80	228.89	Item 8.9
		<b>d) Overhead charges @ 0.06 on (a+b)</b>				617.12	
		<b>e) Contractor's profit @ 0.1 on (a+b+d)</b>				1090.25	
		Cost for 30 metres fencing = a+b+c+d+e				12221.61	
		<b>Rate per metre fencing = (a+b+c +d+e)/30</b>				407.39	
					<b>say</b>	<b>407.00</b>	
		<b>Note</b> Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design. The rate for these items may be taken from respective chapters.					
8.19	Suggestive	<b>Fencing With Welded Steel Wire Fabric 75 mm x 50 mm</b>					
		Providing 1.20 metre high fencing with angle iron posts 50 mm x 50 mm x 6 mm at 3 metre center to center with 0.40 metre embedded in M15 grade cement concrete, corner, end and every 10th post to be struttred, provided with welded steel wire fabric of 75 mm x 50 mm mesh or 75 mm x 25 mm mesh and fixed to iron posts by flat iron 50 x 5 mm and bolts etc. complete in all respects.					
		<b>Unit = Running metre</b>					
		Taking output = 30 m					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Welder	day	1.000	386.00	386.00	L-02b
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Material</b>					
		i) Angle iron for posts 50 x 50 x 6 mm	kg	106.000	44.927	4762.26	M-179 /1000
		ii) Runner flat 50 x 5 mm	kg	26.000	44.927	1168.10	M-179 /1000
		iii) Welded steel wire fabric 75x50 mm mesh @ 4 kg/sqm, 4 x 30 x 1.2 + 5 per cent wastage	kg	151.000	44.36	6698.36	M-191
		<b>OR</b>					
		Welded steel wire fabric 75 x 25 mm mesh @ 7.75 kg/sqm, 7.75 x 30 x 1.2 + 5 per cent wastage	kg	293.000			
		Add 2.5 per cent of cost of material for drilling holes in angles, flats, splitting angle at bottom, nuts and bolts and welded consumables				315.72	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.100	546.00	54.60	P&M-053
		<b>d) Painting</b>					
		Painting two coats including priming	sqm	8.000	57.80	462.40	Item 8.9
		<b>e) Overhead charges @ 0.06 on (a+b+c)</b>				835.90	
		<b>f) Contractor's profit @ 0.1 on (a+b+c+e)</b>				1476.76	
		Cost for 30 metre = a+b+c+d+e+f				16706.74	
		<b>Rate per metre = (a+b+c+d+e+f)/30</b>				556.89	
					<b>say</b>	<b>557.00</b>	
		<b>Note</b> i) Adopt any one type of welded steel wire fabric 75 x 50 mm or 75 x 25 mm as per approved design.					
		ii) The item of excavation and cement concrete in foundation shall be measured and paid separately					
8.20	808	<b>Tubular Steel Railing on Medium Weight Steel Channel ( ISMC series) 100 mm x 50 mm</b>					
		Providing, fixing and erecting 50 mm dia steel pipe railing in 3 rows duly painted on medium weight steel channels (ISMC series) 100 mm x 50 mm, 1.2 metres high above ground, 2 m centre to centre, complete as per approved drawings					
		<b>Unit = Running metre</b>					
		Taking output = 10metres					
		<b>i) Excavation for foundation (6 Nos) 6 x 0.6 x 0.6 x 0.6</b>	cum	1.296	250.00	324.00	Item No. 3.13 A



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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		ii) Foundation concrete M-15 grade PCC 6 x 0.6 x 0.6 x 0.3	cum	0.648	3848.00	2493.50	Item 12.8 (A)
		iii) Painting of pipe	sqm	4.710	57.80	272.24	Item 8.9
		iv) Painting of channel section 6 nos, 1.8 metres each 0.2 x 1.8 x 6 = 2.16	sqm	2.160	57.80	124.85	Item 8.9
		a) Labour (For fixing at site)					
		Mate	day	0.010	272.00	2.72	L-12
		Mazdoor	day	0.250	257.00	64.25	L-13
		Plumber	day	0.010	326.00	3.26	L-02c
		b) Material					
		Steel pipe 50 mm external dia as per IS:1239	metre	30.000	221.02	6630.60	M-175
		Medium weight steel channel (ISMC series) 100 mm x 50 mm, 10.8 metres length @ 9.2 kg per metre	kg	99.360	44.927	4463.95	M-179 /1000
		Add for drilling holes @ 2 per cent of cost of channels				89.28	
		c) Machinery					
		Tractor-trolley	hour	0.040	546.00	21.84	P&M-053
		d) Overhead charges @ 0.06 on (a+b+c)				869.43	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1535.99	
		Cost for 10 metre = i+ii+iii+iv+ a+b+c+d+e				16895.91	
		Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10				1689.59	
					say	<b>1690.00</b>	
8.21	808	<b>Tubular Steel Railing on Precast RCC Posts, 1.2 m High Above Ground Level</b>					
		Providing, fencing and erecting 50 mm dia painted steel pipe railing in 3 rows on precast M20 grade RCC vertical posts 1.8 metres high (1.2 m above GL) with 3 holes 50 mm dia for pipe, fixed 2 metres centre to, complete as per approved drawing					
		Unit = Running metre					
		Taking output = 10metres					
		i) Excavation for foundation (6 Nos) 6 x 0.6 x 0.6 x 0.6	cum	1.296	250.00	324.00	Item No. 3.13 A
		ii) Foundation concrete M - 15 grade PCC 6 x 0.6 x 0.6 x 0.3	cum	0.648	3848.00	2493.50	Item 12.8 (A)
		iii) RCC M - 20 for pre cast posts 6 nos of 1.8 metres each	cum	0.320	4652.00	1488.64	Item 14.1(A)
		iv) Painting of pipe	sqm	4.710	57.80	272.24	Item 8.9
		a) Labour					
		Mate	day	0.014	272.00	3.81	L-12
		Mazdoor	day	0.350	257.00	89.95	L-13
		Plumber	day	0.010	326.00	3.26	L-02c
		b) Material					
		Steel pipe 50 mm dia as per IS:1239	metre	30.000	221.02	6630.60	M-175
		c) Machinery					
		Tractor-trolley	hour	0.250	546.00	136.50	P&M-053
		d) Overhead charges @ 0.06 on (a+b+c)				411.85	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				727.60	
		Cost for 10 metre = i+ii+iii+iv+ a+b+c+d+e				12581.94	
		Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10				1258.19	
					say	<b>1258.00</b>	
8.22	809	<b>Reinforced Cement Concrete Crash Barrier</b>					
		Provision of an Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with M-20 grade concrete with HYSD reinforcement conforming to IRC:21 and dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MOST circular No. RW/NH - 33022/1/94 DO III dated 24 June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified					
		Unit = Linear metre					
		Taking output = 10 m					

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Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		(i)	a) M 20 grade concrete					
			M 20 grade concrete	cum	3.000	4652.00	13956.00	Item 14.1(A)
			b) Labour					
			Mate	day	0.040	272.00	10.88	L-12
			Mazdoor	day	1.000	257.00	257.00	L-13
			c) Material					
			HYSD steel reinforcement including dowel bars	tonne	0.280	42532.00	11908.96	M-082
			Pre-moulded asphalt filler board	sqm	0.320	939.64	300.68	M-144
			d) Overhead charges @ 0.06 on (b+c)				748.65	
			e) Contractor's profit @ 0.1 on (b+c+d)				1322.62	
			Cost for 10 metre = a+b+c+d+e				28504.79	
			Rate per metre = (a+b+c+d+e)/10				2850.48	
						say	<u>2850.00</u>	
		Note	i) Excavation and backfilling are incidental to work and not to be measured separately.					
			ii) Rate for RCC M 20 may be taken from chapter on super structure.					
8.23	810		Metal Beam Crash Barrier					
	A		Type - A, "W" : Metal Beam Crash Barrier					
			Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fittings to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810					
			Unit = Running metre					
			Taking output = 4.5 metre length					
			a) Labour					
			Mate	day	0.060	272.00	16.32	L-12
			Blacksmith	day	0.500	345.00	172.50	L-02a
			Mazdoor	day	1.000	257.00	257.00	L-13
			b) Machinery					
			Tractor-trolley	hour	0.100	546.00	54.60	P&M-053
			c) Material					
			Corrugated sheet, 3 mm thick, "W" beam section railing, 4.5 m in length	kg	41.210	44.927	1851.44	M-179 /1000
			Channel post 150 x 75 x 5 mm, 1.8 m long, 3 Nos @ 16.4 kg per metre	kg	88.560	44.927	3978.74	M-179 /1000
			Spacer 150 x 75 x 5 mm channel 0.33 m long, 3 Nos @ 16.4 kg per metre	kg	16.240	44.927	729.61	M-179 /1000
			Nuts and bolts	kg	20.000	61.19	1223.80	M-130
			Add 25 per cent of the cost of material for fabrication, nuts, bolts and washers etc.)				1945.90	
			d) Overhead charges @ 0.06 on (a+b+c)				613.79	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				1084.37	
			Cost for 4.5 metre = a+b+c+d+e				11928.07	
			Rate per metre = (a+b+c+d+e)/4.5				2650.68	
						say	<u>2651.00</u>	
8.23		B	Type - B, "THRIE" : Metal Beam Crash Barrier					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Providing and erecting a "Thrie" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 85 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 2 m high with 1.15 m below ground level, all steel parts and fittings to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a space of channel section 150 x 75 x 5 mm, 546 mm long complete as per clause 810					
		<b>Unit = Running metre</b>					
		Taking output = 4.5 metre length					
		<b>a) Labour</b>					
		Mate	day	0.060	272.00	16.32	L-12
		Blacksmith	day	0.500	345.00	172.50	L-02a
		Mazdoor	day	1.000	257.00	257.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	0.100	546.00	54.60	P&M-053
		<b>c) Material</b>					
		Corrugated sheet, 3 mm thick, "Thrie" beam section railing, 4.5 m in length	kg	72.940	45.04	3285.22	M-088
		Channel post 150 x 75 x 5 mm, 2 m long, 3 Nos @ 16.4 kg per metre	kg	98.400	44.927	4420.82	M-179 /1000
		Spacer 150 x 75 x 5 mm channel 0.546 m long, 3 Nos	kg	26.860	44.927	1206.74	M-179 /1000
		Nuts and bolts	kg	30.000	61.19	1835.70	M-130
		Add 15 per cent of the cost of material for fabrication, nuts, bolts and washers etc.)				1612.27	
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				771.67	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1363.28	
		Cost for 4.5 metre = a+b+c+d+e				14996.12	
		<b>Rate per metre= (a+b+c+d+e)/4.5</b>				3332.47	
					<b>say</b>	<b>3332.00</b>	
		<b>Note</b> In the case of median crash barrier, "W" metal beam or thrie beam section should be provided on both sides of the vertical posts fixed in the median. Extra provision for metal beam railing and spacer is required to be made when fixed in the median depending on approved design.					
8.24	811	<b>Road Traffic Signals electrically operated</b>					
		<b>Note</b> Since it is a ready made item commercially produced and erected by specialised firm in the electrical and electronic field, rate may be taken based on market enquiry from firms specialised in this field and ISI certified for the approved design and drawing.					
8.25	<b>Suggestive</b>	<b>Flexible Crash Barrier, Wire Rope Safety Barrier</b>					
		Providing and erecting a wire rope safety barrier with vertical posts of medium weight RS Joist (ISMB series) 100 mm x 75 mm (11.50 kg/m), 1.50 m long 0.85 m above ground and 0.65 m below ground level, split at the bottom for better grip, embedded in M 15 grade cement concrete 450 x 450 x 450 mm, 1.50 m center to center and with 4 horizontal steel wire rope 40 mm dia and anchored at terminal posts 15 m apart. Terminal post to be embedded in M 15 grade cement concrete foundation 2400 x 450 x 900 mm (depth), strengthened by a strut of RS joist 100 x 75 mm, 2 m long at 45° C inclination and a tie 100 x 8 mm, 1.50 m long at the bottom, all embedded in foundation concrete as per approved design and drawing, rate excluding excavation and cement concrete.					
		<b>Unit = Running metre</b>					
		Taking output = 15 metre					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Blacksmith	day	1.000	345.00	345.00	L-02a
		<b>b) Material</b>					
		i) RS Joist 100 x 75 mm - 16.5 m @ 11.5 kg per metre	kg	190.000	44.927	8536.13	M-179 /1000
		ii) Struts - 2 Nos. for terminal posts, 2 m long each 2 x 2 x 11.50	kg	46.000	44.927	2066.64	M-179 /1000
		iii) Tie 2 Nos. of 8 mm steel plate, 1.5 sqm each for terminal posts @ 62.80 kg/sqm (2 x 1.5)	kg	188.400	44.927	8464.25	M-179 /1000
		iv) Steel wire rope 40 mm, including 7.50 per cent extra for fixing at ends 15 x 4 x 1.075 @ 1 kg per m	kg	65.000	42.15	2739.75	M-177
		Add 5 per cent of cost of material for drilling, gripping, fixing, fabrication and welding consumables				1090.34	
		<b>c) Painting</b>					
		Applying 2 coats of painting on exposed surface	sqm	16.500	57.80	953.70	Item 8.9
		<b>d) Machinery</b>					
		Tractor-trolley	hour	0.250	546.00	136.50	P&M-053
		<b>e) Overhead charges @ 0.06 on (a+b+d)</b>				1435.51	
		<b>f) Contractor's profit @ 0.1 on (a+b+d+e)</b>				2536.08	
		Cost for 15 m = a+b+c+d+e+f				28850.54	
		<b>Rate per m = (a+b+c+d+e+f)/15</b>				1923.37	
					say	<b>1923.00</b>	
		<b>Note</b>					The items of excavations and cement concrete works will be measured and included separately as per the approved designs and drawings.
8.26	Suggestive	<b>Anti-Glare Devices in Median</b>					
		<b>A Plantation</b>					
		Plantation of shrubs and plants of approved species in the median. apart from cutting off glare from vehicle coming from opposite direction, these plants provide a pleasant environment and are eco-friendly. The rate for this item is available in the chapter 11 on horticulture.					
		<b>B Anti-glare screen with 25 mm steel pipe framework fixed with circular and rectangular vanes</b>					
		Providing and erecting an anti - glare screen with 25 mm dia vertical pipes fabricated and framed in the form of panels of one metre length and 1.75 metre height fixed with circular vane 250 mm dia at top and rectangular vane 600 x 300 mm at the middle, made out of steel sheet of 3 mm thickness, end vertical pipes of the panel made larger for embedding in foundation concrete, applying 2 coats of paint on all exposed surfaces, all as per approved design and drawings.					
		<b>Unit = Running metre</b>					
		Taking output = one metre					
		<b>a) Labour</b>					
		Mate	day	0.004	272.00	1.09	L-12
		Mazdoor	day	0.100	257.00	25.70	L-13
		<b>b) Material</b>					
		i) 25 mm steel pipe	metre	16.000	123.51	1976.16	M-174
		ii) MS sheet for 600 x 300 x 3 mm rectangular vane, one number @ 24kg/sqm	kg	4.320	44.927	194.08	M-179 /1000
		iii) MS sheet for 250 mm dia circular vane 3 mm thick, 4 numbers @ 24 kg/sqm	kg	4.800	44.927	215.65	M-179 /1000
		Add 5 per cent cost of material for fabrication, welding, bending, nuts, bolts etc				119.29	
		<b>c) Painting</b>					
		Applying 2 coats of painting on exposed surface	sqm	1.830	57.80	105.77	Item 8.9
		<b>d) Overhead charges @ 0.06 on (a+b)</b>				151.92	
		<b>e) Contractor's profit @ 0.1 on (a+b+d)</b>				268.39	
		<b>Rate per metre = a+b+c+d+e</b>				3058.06	
					say	<b>3058.00</b>	
		<b>Note</b>					The items of excavation and cement concrete as per approved design to be measured and paid separately
8.26		<b>C Anti-glare screen with rectangular vane of MS sheet</b>					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Providing and erecting anti - glare screen with rectangular vanes of size 750 x 500 mm made from MS sheet, 3 mm thick and fixed on MS angle 50 x 50 x 6 mm at an angle of 45° C to the direction of flow of traffic, 1.5 m center to center, top edge of the screen 1.75 m above ground level, vertical post firmly embedded in M-15 cement concrete foundation 0.60 m below ground level, applying 2 coats of paint on exposed faces, all complete as per approved design and drawings					
		<b>Unit = Running metre</b>					
		Taking output = 1.50 metre					
		<b>a) Labour</b>					
		Mate	day	0.004	272.00	1.09	L-12
		Mazdoor	day	0.100	257.00	25.70	L-13
		<b>b) Material</b>					
		i) Angle iron post, 50 x 50 x 6 mm, length 2.35 m	kg	10.580	44.927	475.33	M-179 /1000
		ii) MS sheet 3 mm thick @ 24 kg/sqm	kg	9.000	44.927	404.34	M-179 /1000
		Add 5 percent of cost of material for fabrication, nuts, bolts etc				43.98	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.100	546.00	54.60	P&M-053
		<b>d) Painting</b>					
		Applying 2 coats of painting	sqm	0.850	57.80	49.13	Item 8.9
		<b>e) Overhead charges @ 0.06 on (a+b+c)</b>				60.30	
		<b>f) Contractor's profit @ 0.1 on (a+b+c+e)</b>				106.53	
		Cost for 1.5 m = a+b+c+d+e+f				1221.01	
		<b>Rate per metre = (a+b+c+d+e+f)/1.50</b>				814.01	
					say	<b>814.00</b>	
		<b>Note</b> The items of excavation and cement concrete as per approved design to be measured and paid separately. Rate of painting has been analysed separately in this chapter.					
8.27	Suggestive	<b>Street Lighting</b>					
		Providing and erecting street light mounted on a steel circular hollow pole of standard specifications for street lighting, 9 m high spaced 40 m apart, 1.8 m overhang on both sides if fixed in the median and on one side if fixed on the footpath, fitted with sodium vapour lamp and fixed firmly in concrete foundation.					
		<b>Unit = Each</b>					
		Taking output = one light					
		<b>a) Labour</b>					
		Mate	day	0.030	272.00	8.16	L-12
		Mazdoor	day	0.500	257.00	128.50	L-13
		Electrician	day	0.250	326.00	81.50	L-02d
		<b>b) Material</b>					
		i) Steel circular hollow pole of standard specification for street lighting to mount light at 9 m height above road level	each	1.000	input	#VALUE!	M-171
		ii) Sodium vapour lamp	each	1.000	input	#VALUE!	M-168
		Add 5 per cent of cost of material for holder, electric cable, insulation, ladder, scaffolding etc				#VALUE!	
		<b>c) Painting</b>					
		<b>For Fixing in Median</b>					
		Providing two coats of alluminium paint over steel circular hollow pipe with overhang on both sides	sqm	5.750	57.80	332.35	Item 8.9
		<b>For fixing in Footpath</b>					
		Providing two coats of alluminium paint over steel circular hollow pipe with overhang on one side	sqm	4.630	57.80	267.61	Item 8.9
		<b>(i) For Fixing in Median</b>					
		<b>d) Overhead charges @ 0.06 on (a+b)</b>				#VALUE!	
		<b>e) Contractor's profit @ 0.1 on (a+b+d)</b>				#VALUE!	
		<b>Rate per light for fixing in Median= a+b+c+d+e</b>				#VALUE!	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
					say	#VALUE!	
	(ii)	For fixing in Footpath					
		Rate per light for Fixing in Footpath = a+b+c+d+e				#VALUE!	
					say	#VALUE!	
	Note	The items of excavation and cement concrete foundation will be measured and included separately in the estimate as per approved design and drawing. The rate for painting has been analysed in this chapter.					
8.28	Suggestive	Lighting on Bridges					
		Providing and fixing lighting on bridges, mounted on steel hollow circular poles of standard specifications, 5 m high fixed on parapets with cement concrete, 20 m apart and fitted with sodium vapour lamp					
		Unit = Each					
		Taking output = one light					
		a) Labour					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoor	day	0.400	257.00	102.80	L-13
		Electrician	day	0.200	326.00	65.20	L-02d
		b) Material					
		i) Steel circular hollow pole of standard specification for street lighting to mount light at 5 m above deck level	each	1.000	input	#VALUE!	M-170
		ii) Sodium vapour lamp 70 watt	each	1.000	input	#VALUE!	M-168
		Add 1 per cent of cost of material for holder, electric cable, insulation, ladder, scaffolding etc				#VALUE!	
		c) Painting					
		Providing two coats of alluminium paint over steel circular hollow pipe	sqm	2.760	57.80	159.53	Item 8.9
		d) Overhead charges @ 0.06 on (a+b)				#VALUE!	
		e) Contractor's profit @ 0.1 on (a+b+d)				#VALUE!	
		Rate per light = a+b+c+d+e				#VALUE!	
					say	#VALUE!	
	Note	The items of cement concrete to be measured and paid separately as per approved design. The rate for painting has already been analysed in this chapter.					
8.29	Suggestive	Cable Duct Across the Road					
		Providing and laying of a reinforced cement concrete pipe duct, 300 mm dia, across the road (new construction), extending from drain to drain in cuts and toe of slope to toe of slope in fills, constructing head walls at both ends, providing a minimum fill of granular material over top and sides of RCC pipe as per IRC:98-1997, bedded on a 0.3 m thick layer of granular material free of rock pieces, outer to outer distance of pipe at least half dia of pipe subject to minimum 450 mm in case of double and triple row ducts, joints to be made leak proof, invert level of duct to be above higher than ground level to prevent entry of water and dirt, all as per IRC: 98 - 1997 and approved drawings.					
	Case(i)	Single row for one utility service					
		Unit = Running metre					
		Taking output = 20metres					
		a) Random Rubble masonry/Brick masonry in cement mortar 1:6 for head wall both side	cum	2.360	2528.00	5966.08	Item 12.7 (Addl.B)
		b) Labour					
		Mate	day	0.050	272.00	13.60	L-12
		Mazdoor	day	1.000	257.00	257.00	L-13
		Mazdoor skilled	day	0.250	325.00	81.25	L-15
		c) Material					
		Reinforced Cement Concrete pipe 300 mm dia	metre	20.000	502.61	10052.20	M-151

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 20 m)	cum	7.200	131.53	947.02	M-009
		Collar for joints 300 mm dia	each	9.000	input	#VALUE!	M-083
		Cement mortar 1:2 for joints	cum	0.020	3848.00	76.96	Item 12.6 (B)
		<b>d) Machinery</b>					
		Tractor-trolley	hour	0.500	546.00	273.00	P&M-053
		<b>e) Overhead charges @ 0.06 on (b+c+d)</b>				#VALUE!	
		<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				#VALUE!	
		Cost for 20 metre = a+b+c+d+e+f				#VALUE!	
		<b>Rate per metre = (a+b+c+d+e+f)/20</b>				#VALUE!	
					say	#VALUE!	
8.29	Case(ii)	<b>Double row for two utility services</b>					
		<b>Unit = Running metre</b>					
		Taking output = 20metres					
		<b>a) Random Rubble brick/Brick masonry in cement mortar 1:6 for head wall both sides.</b>	cum	3.370	sor	#VALUE!	Item 12.7 (Addl.B)
		<b>b) Labour</b>					
		Mate	day	0.050	272.00	13.60	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		Mazdoor skilled	day	0.250	325.00	81.25	L-15
		<b>c) Material</b>					
		Reinforced Cement Concrete pipe 300 mm dia	metre	40.000	502.61	20104.40	M-151
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 40 m)	cum	14.400	131.53	1894.03	M-009
		Collar for joints 300 mm dia	each	18.000	input	#VALUE!	M-083
		Cement mortar 1:2 for joints	cum	0.040	3848.00	153.92	Item 12.6 (B)
		<b>d) Machinery</b>					
		Tractor-trolley	hour	1.000	546.00	546.00	P&M-053
		<b>e) Overhead charges @ 0.06 on (b+c+d)</b>				#VALUE!	
		<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				#VALUE!	
		Cost for 20 metre = a+b+c+d+e+f				#VALUE!	
		<b>Rate per metre = (a+b+c+d+e+f)/20</b>				#VALUE!	
					say	#VALUE!	
8.29	Case(iii)	<b>Triple rRow for three utility services</b>					
		<b>Unit = Running metre</b>					
		Taking output = 20metres					
		<b>a) Random Rubble brick/Brick masonry in cement mortar 1:6 for head wall both sides.</b>	cum	4.380	sor	#VALUE!	Item 12.7 (Addl.B)
		<b>b) Labour</b>					
		Mate	day	0.160	272.00	43.52	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		Mazdoor skilled	day	1.000	325.00	325.00	L-15
		<b>c) Material</b>					
		Reinforced Cement Concrete pipe 300 mm dia	metre	60.000	502.61	30156.60	M-151
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 60 m)	cum	21.600	131.53	2841.05	M-009
		Collar for joints 300 mm dia	each	27.000	input	#VALUE!	M-083
		Cement mortar 1:2 for joints	cum	0.060	3848.00	230.88	Item 12.6 (B)
		<b>d) Machinery</b>					
		Tractor-trolley	hour	1.500	546.00	819.00	P&M-053
		<b>e) Overhead charges @ 0.06 on (b+c+d)</b>				#VALUE!	
		<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				#VALUE!	
		Cost for 20 metre = a+b+c+d+e+f				#VALUE!	
		<b>Rate per metre = (a+b+c+d+e+f)/20</b>				#VALUE!	
					say	#VALUE!	
	Note	1.Inspection chamber at both ends is the responsibility of the agency who is laying the duct. Hence not included.					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		2.The rates for stone masonry / brick masonry and cement mortar to be adopted from respective clauses.					
8.30	Suggestive	<b>Highway Patrolling and Traffic Aid Post</b>					
		It is proposed to locate one Traffic Aid Post every 50-60 km of the highway.					
		The organisation and financial aspect are required to be finalised in consultation with administrative and traffic authorities .					
8.31	Suggestive	<b>Items Related to Underpass/ Subway/ Overhead Bridge/ Overhead Foot Bridge</b>					
		The items involved for underpass/ subway/ overhead bridge/ overhead foot bridge are earthwork, plain cement concrete, plastering, painting, information sign etc. The rates for these items are available in respective chapters which can be adopted for the quantities derived from the approved designs and drawings					
8.32	Suggestive	<b>Traffic Control System and Communication System</b>					
		Providing a traffic control centre and communication system including telecommunication facilities and related accessories, CCTV, radar, vehicle detection camera, central computer system					
		These are specialised item of telecommunication system and are the commercial products. The designer is required to contact the manufacturers to ascertain market prices. In case of civil works required to be executed for these installations, pricing may be done as per rates in relevant chapters for quantities derived as per approved design and drawing.					
		As regards the locations where such devices are required to be installed, the traffic control authority should be consulted to finalise the location					
8.33	Suggestive	<b>Gantry Mounted Variable Message Sign Board</b>					
		Providing and erecting gantry mounted variable message sign board electronically operated capable of flashing the desired message over a designed support system of aluminium alloy or galvanised steel, erected as per approved design and drawings and with lateral clearance as per clause 802.3					
		(i) <b>Gantry Support System</b>					
		<b>Unit = tonne</b>					
		Taking output=1 tonne					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		Blacksmith	day	1.000	345.00	345.00	L-02a
		<b>b) Material</b>					
		Alluminium alloy/galvanised steel including 5 per cent wastage	tonne	1.050	34460.81	36183.85	M-060
		Add 15 per cent of cost of material for fabrication and erection.				5427.58	
		Add 1 per cent of cost of material for nuts, bolts and welding				361.84	
		<b>c) Machinery</b>					
		Truck 10 tonne	hour	1.000	929.00	929.00	P&M-057
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				2627.63	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				4642.15	
		<b>Rate per tonne = a+b+c+d+e</b>				51063.70	
					say	<b>51064.00</b>	
8.33		(ii) <b>Message Display</b>					
		Message display board 6 sqm electronically operated with complete electronic fitments for flashing the pre-determined messages.					



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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		This is a specialised commercial product and the lumpsum rate including erection at site is required to be ascertained from the market and including in the rate analysis. The size of the board will vary depending upon specific location.					
		The rate for the gantry mounted variable sign would be the addition of cost of gantry support system as per approved design determined at (i) above and the cost of message display board as ascertained from the market at (ii) above					
8.34	Suggestive	<b>Traffic Impact Attenuators at Abutments and Piers</b>					
	A	<b>With Scrap Tyres</b>					
		Provision and installation of traffic attenuators at abutment/pier of flyovers bridges using scrap tyres of size 100 x 20 retrieved from trucks laid in 2 rows and 4 tiers, one above the other and tied with 20 mm wire rope as per approved design and drawings.					
		<b>Unit = sqm</b>					
		Taking output = 20sqm					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	1.500	257.00	385.50	L-13
		Blacksmith	day	0.250	345.00	86.25	L-02a
		<b>b) Material</b>					
		Scrap tyres of size 900 x 20	each	80.000	75.17	6013.60	M-161
		20 mm steel wire rope	kg	150.000	42.15	6322.50	M-176
		Add 1 per cent of cost of wire rope for clamps etc.				63.23	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	3.000	546.00	1638.00	P&M-053
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				871.85	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1540.27	
		Cost for 20 sqm = a+b+c+d+e				16942.95	
		<b>Rate per sqm = (a+b+c+d+e)/20</b>				847.15	
					say	<b>847.00</b>	
8.34	B	<b>Using Plastic/Steel Barrel, Filled with Sand</b>					
		Provision and installation of traffic impact attenuator at abutment/pier of flyovers bridges using plastic/steel barrels 0.60 m dia and 1.0 m in height, filled with sand in three rows and tied with 20 mm steel wire rope as per approved design and drawings					
		<b>Unit = sqm</b>					
		Taking output = 20sqm					
		<b>a) Labour</b>					
		Mate	day	0.130	272.00	35.36	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		Blacksmith	day	0.250	345.00	86.25	L-02a
		<b>b) Material</b>					
		Plastic barrels	each	50.000			
		<b>or</b>					
		Steel barrels	each	50.000	125.91	6295.50	M-172
		Sand	cum	8.000	150.80	1206.40	M-004
		20 mm steel wire rope	kg	15.000	42.15	632.25	M-176
		Add 1 per cent of cost of wire rope for clamps etc.				6.32	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	2.000	546.00	1092.00	P&M-053
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				607.50	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1073.26	
		Cost for 20 sqm = a+b+c+d+e				11805.85	
		<b>Rate per sqm = (a+b+c+d+e)/20</b>				590.29	
					say	<b>590.00</b>	

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Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
8.34		C	<b>With HI - DRO cell Sandwich (Patented)</b>					
			(In this patented HI - DRO cell system, water gets discharged from plastic tubes on impact over a pre-determined time, thus absorbing the energy)					
			Providing and installing a patentend HI - DRO cell system as a traffic impact attenuators, using plastic tubes 50 cm dia, 1.2 m in height, 25 mm opening at the top, placed in three rows, filled with water and tied with a 20 mm steel wire rope					
			<b>Unit = sqm</b>					
			Taking output = 10sqm					
			<b>a) Labour</b>					
			Mate	day	0.100	272.00	27.20	L-12
			Mazdoor	day	2.500	257.00	642.50	L-13
			<b>b) Material</b>					
			Plastic tubes 50 cm dia, 1.2 m high	each	40.000	input	#VALUE!	M-139
			Cost of water	KL	12.000	253.69	3044.28	M-189
			20 mm steel wire rope	kg	100.000	42.15	4215.00	M-176
			Add 1 per cent of cost of wire rope for clamps etc.				42.15	
			<b>c) Machinery</b>					
			Tractor-trolley	hour	2.000	546.00	1092.00	P&M-053
			Water tanker6 KL capacity	hour	2.000	183.00	366.00	P&M-060
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				#VALUE!	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				#VALUE!	
			Cost for 10 sqm = a+b+c+d+e				#VALUE!	
			<b>Rate per sqm = (a+b+c+d+e)/10</b>				#VALUE!	
						say	<b>#VALUE!</b>	
8.35	Suggestive		<b>Road Markers/Road Stud with micro prismatic Lens Reflector</b>					
			Providing and fixing of road stud 100x 100 mm, die-cast moulded from ASA (Acrylic strene acrylonitrile)High impact poly styrene or ABS body resistant to minimum support a load of 13635 Kg and Fitted with micro prismatic lence Reflector installed in concrete or asphaltic surface by drilling hole 30 mm upto a depth of 60 mm and bedded in a suitable bituminous grout or epoxy mortar, all as per MORTH Letter NO. RW/NH/33023/10/97-DO-III dt. 11-06 97					
			<b>Unit = Nos</b>					
			Taking output = 50Nos					
			<b>a) Labour</b>					
			Mate	day	0.040	272.00	10.88	L-12
			Mazdoor	day	1.000	257.00	257.00	L-13
			<b>b) Material</b>					
			ASA (Acrylic strene acrylonitrile)High impact poly styrene or ABS body resistant .100X100mm t fitted with lense reflector	each	50.000	165.38	8269.00	M-062
			Add 10 per cent of cost of material for fixing and installation				826.90	
			<b>c) Overhead charges @ 0.06 on (a+b)</b>				561.83	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				992.56	
			Cost for 50 studs = a+b+c+d				10918.17	
			<b>Rate per studs = (a+b+c+d)/50</b>				218.36	
						say	<b>218.00</b>	
8.36	Suggestive		<b>Traffic Cone</b>					
			Provision of red fluorescent with white reflective sleeve traffic cone made of low density polyethylene (LDPE) material with a square base of 390 x 390 x 35 mm and a height of 770 mm, 4 kg in weight, placed at 1.5 m interval, all as per BS 873					
			<b>Unit = Running metre</b>					
			Taking output = 68 Nos.					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>a) Labour</b>					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoor	day	0.500	257.00	128.50	L-13
		<b>b) Material</b>					
		Traffic cones with 150 mm reflective sleeve	each	68.000	input	#VALUE!	M-186
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.100	546.00	54.60	P&M-053
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				#VALUE!	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				#VALUE!	
		Cost for 68 Nos. = a+b+c+d+e				#VALUE!	
		<b>Rate per metre = (a+b+c+d+e)/68</b>				#VALUE!	
					say	#VALUE!	
8.37	Suggestive	<b>Roadside Amenities</b>					
	A	<b>Rest areas</b>					
		Providing plainly furnished accommodation for rest rooms, dormitories, restaurants, stalls, shops, petrol pump, telephone booth, first aid room, traffic aid post, police assistance booth, including electricity, toilet and sewerage system					
		Pricing may be done based on current plinth area rates approved by PWD/CPWD/MES for a particular zone. Area is required to be assessed for specific location as per actual site conditions					
	B	<b>Parking areas and bus laybys for trucks, buses and light vehicles</b>					
		Pricing of parking areas may be done for the quantities of various items based on the approved dimensions and pavement design for a particular terrain and soil. Rates for items may be from respective chapters.					
	C	<b>Lawn</b>					
		Providing a lawn planted with grass and its maintenance					
		Pricing of lawn may be done as per rates given in the chapter on horticulture for the quantities as per approved dimensions in the drawings					
8.38	Suggestive	<b>Rumble Strips</b>					
		Provision of 15 nos rumble strips covered with premix bituminous carpet, 15-20 mm high at center, 250 mm wide placed at 1 m center to center at approved locations to control speed, marked with white strips of road marking paint.					
		<b>Unit = sqm</b>					
		Taking output = 100 sqm (including gaps)					
		The rate per sqm of premix carpet and road marking may be adopted from chapter 5 & 8 respectively for the quantities calculated from approved drawings					
8.39	Suggestive	<b>Policeman Umbrella</b>					
		Provision of a 2 m high (floor to roof) umbrella for traffic policeman at road crossings, where necessary, installed on a raised platform, built on a central support of a steel pipe 100 mm dia, roof made of 25 mm dia steel pipe to provide covered area of 3 sqm, roofed with CGI sheets, all steel parts to be given 2 coats of paint					
		<b>Unit = each</b>					
		Taking output = one number					
		Earthwork	cum				
		Cement Concrete	cum				
		brick masonry or	cum				
		stone masonry	cum				
		Painting	sqm	2.500			
		<b>a) Labour</b>					
		Mate	day	0.090			
		Mazdoor	day	1.000			

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Blacksmith	day	1.000			
		Welder	day	0.250			
		<b>b) Material</b>					
		Steel pipe 100 mm dia	metre	3.500			
		Steel pipe 25 mm dia	metre	10.000			
		CGI sheets	kg	8.000			
		Add 25 per cent of cost of material for fabrication					
		Add 2 per cent of cost of material for welding consumables, J-hooks, washers etc.					
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.500			
		<b>d) Overheads @ per cent on (a+b+c)</b>					
		<b>e) Contractors Profit@ per cent on (a+b+c+d)</b>					
		<b>Rate per policeman umbrella = a+b+c+d+e</b>					
8.40	suggestive	<b>High Mast Pole Lighting at Interchanges and Flyovers</b>					
		Providing and erecting a high mast pole lighting with 30 m high hot dip galvanised mast designed to withstand forces exerted with wind speeds of 180 km per hour with 3 seconds gust, as per IS:875 (Part 3) - 1978, fitted with a base flange, door at the base of mast with heavy duty internal lock, lantern carriage, suitable winching arrangement for safe working load of 750 kg and high powered electrically driven power tools for raising and lowering of lantern carriage, flexible 8 core electric cable, lightning conductor, earthing terminal, and fixing 2 nos aviation obstruction lights on top of the mast, all complete as per approved design and drawings					
		This is a specialised work and is generally done by firms who specialise in such jobs. The detailed designs and estimates are submitted by the firms along with their tender for checks by the Department. The cost of this work is required to be worked out based on approved design, drawings and estimate of the lowest tender. A separate contract for this work is concluded as the contractors for road and bridge works generally donot undertake such jobs.					
8.41		<b>Toll Plaza</b>					
		The construction, operation and maintenance of Toll Plaza can be broken into separate items of work as under based on the approved design and drawings:-					
		a) Provision of toll collection service lane to separate different categories of vehicles for purpose of toll collection. This involves considerable increase in carriage way width					
		b) Provision of 2.5 m wide separators for different toll collection service lanes for safety					
		c) Toll booths with integrated roof cover					
		d) Barrier gates for individual lanes					
		e) Provision of building to provide facility to toll plaza personnel					
		f) Toll plaza office equipment and furniture					
		g) Water supply, electricity, sanitation, septic-tank system and drainage					
		h) Telephone, intercomes, wireless communication system					
		i) High mast lighting					
		j) Pavement marking					
		k) Overhead signs					
		l) Fixed message signs (Advance)					
		m) Variable message signs					
		n) Traffic cones and pylons					
		o) First aid post					
		p) Traffic aid post and security					

Analysis of Rates  
**TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		The quantities for the above mentioned items may be calculated from the approved design and drawings and their rates adopted from respective chapters of the Standard Data Book					
8.42		<b>Safety Devices and Signs in Construction Zones</b>					
		Provision and fixing of traffic signs for limited period at suitable locations in construction zone comprising of warning zone, approach transition zone, working zone and terminal transition zone with a minimum distance of 60 cm from the edge of the kerb in case of kerbed roads and 2 to 3 m from the edge of the carriageway in case of un-kerbed roads, the bottom edge of the lowest sign plate to be not less than 2 m above the road level, fixed on 60 mm x 60 mm x 6 mm angle iron post, founded and installed as per approved design and drawings, removed and disposed of after completion of construction work, all as per IRC:SP:55-2001					
		<b>Unit = each</b>					
		Taking output = one sign post					
		Following types of signs are required to be fixed in construction zones for safety of traffic					
		a) Diversion one km ahead					
		b) Traffic sign ahead					
		c) Road ahead closed					
		d) Men at work					
		e) Road narrow					
		f) Single file traffic					
		g) Right lane diverted					
		h) Left lane diverted					
		i) Right lane closed					
		j) Left lane closed					
		k) Median closed					
		l) Diversion to other carriageway					
		m) Traffic signal ahead					
		n) Two way traffic					
		o) Un - even road					
		p) Slippery road					
		q) Loose chippings					
		r) Dual carriageway ends					
		s) Diversion					
		t) Do not enter					
		u) Road closed					
		v) Stop					
		w) Slow					
		x) One way					
		y) Give way					
		z) Overtaking prohibited					
		aa) Speed limit					
		bb) Weight limit					
		cc) Height and length limit					
		dd) No stopping or standing					
		ee) Any other warning or regulatory safety sign as per site requirement and consistent with IRC:SP:55-2001 and IRC:67					
		The rate for traffic signs are already worked out and given elsewhere in this chapter. The same may be adopted.					
8.43	suggestive	<b>Portable Barricade in Construction Zone</b>					

Analysis of Rates  
**TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Installation of a steel portable barricade with horizontal rail 300 mm wide, 2.5 m in length fitted on a 'A' frame made with 45 x 45 x 5 mm angle iron section, 1.5 m in height, horizontal rail painted (2 coats) with yellow and white stripes, 150 mm in width at an angle of 45° C, 'A' frame painted with 2 coats of yellow paint, complete as per IRC:SP:55-2001					
		<b>Unit = each</b>					
		Taking output = one steel portable barricade					
		<b>a) Labour</b>					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoor	day	0.250	257.00	64.25	L-13
		Painter	day	0.500	326.00	163.00	L-18
		Welder	day	0.250	386.00	96.50	L-02b
		<b>b) Material</b>					
		Angle iron 45 x 45 x 5 mm	kg	25.000	44.927	1123.18	M-179 /1000
		MS sheet 300 mm wide, 2.5 m long and 2.6 mm thick	kg	15.000	44.927	673.91	M-179 /1000
		Paint	litre	0.500	219.05	109.53	M-131
		Add 2 per cent of cost of steel for welding consumables, nuts & bolts and drilling holes				35.94	
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				136.30	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				240.80	
		<b>Rate per barricade = a+b+c+d</b>				2648.84	
					<b>say</b>	<b>2649.00</b>	
8.44	suggestive	<b>Permanent Type Barricade in Construction Zone</b>					
		<b>A With steel components</b>					
		Construction of a permanent type barricade made of steel components, 1.5 m high from road level, fitted with 3 horizontal rails 200 mm wide and 4 m long on 50 x 50 x 5 mm angle iron vertical support, painted with yellow and white strips, 150 mm in width at an angle of 45° C, complete as per IRC:SP:55-2001					
		<b>Unit = each</b>					
		Taking output = one barricade					
		<b>a) Labour</b>					
		Mate	day	0.050	272.00	13.60	L-12
		Mazdoor	day	0.300	257.00	77.10	L-13
		Painter	day	0.600	326.00	195.60	L-18
		Welder	day	0.300	386.00	115.80	L-02b
		<b>b) Material</b>					
		Angle iron 50 x 50 x 5 mm, 2 m long, 2 Nos.	kg	15.000	44.927	673.91	M-179 /1000
		MS sheet of 12 SWG, 3 Nos of 200 mm width and 4 m length	kg	50.000	44.927	2246.35	M-179 /1000
		Paint	litre	1.000	219.05	219.05	M-131
		Add 1 per cent of cost of steel for welding consumables, nuts & bolts and drilling holes				29.20	
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				214.24	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				378.48	
		<b>Rate per barricade = a+b+c+d</b>				4163.33	
					<b>say</b>	<b>4163.00</b>	
8.44		<b>B With wooden components</b>					
		Construction of a permanent type barricade made of wooden components, 1.5 m high from road level, fitted with 3 horizontal planks 200 mm wide and 3.66 m long on 100 x 100mm wooden vertical post, painted with yellow and white strips, 150 mm in width at an angle of 45° C, complete as per IRC:SP:55-2001					
		<b>Unit = each</b>					
		Taking output = one barricade					
		<b>a) Labour</b>					

Analysis of Rates  
**TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	0.050	272.00	13.60	L-12
		Mazdoor	day	0.300	257.00	77.10	L-13
		Painter	day	0.600	326.00	195.60	L-18
		Carpenter	day	0.600	345.00	207.00	L-04
		<b>b) Material</b>					
		Timber	cum	0.180	42224.54	7600.42	M-185
		Add 1 per cent of cost of timber for nuts & bolts, nails, etc.				76.00	
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				490.18	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				865.99	
		<b>Rate per barricade = a+b+c+d</b>				9525.90	
					say	<b>9526.00</b>	
8.44	C	<b>With bricks</b>					
		Construction of a permanent type barricade made with brick work in mud mortar, 1.5 m high, 4 m long, 600 mm thick, plastered with cement mortar 1:6, painted with yellow and white strips					
		<b>Unit = each</b>					
		Taking output = one barricade					
		<b>a) Labour</b>					
		Mate	day	0.240	272.00	65.28	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		Painter	day	1.000	326.00	326.00	L-18
		Mason	day	2.000	345.00	690.00	L-11
		<b>b) Material</b>					
		Brick	each	1800.000	6.214	11185.20	M-079
		Cement	kg	22.000	5.156	113.43	M-081 /1000
		Sand	cum	0.090	150.80	13.57	M-005
		Paint	litre	1.250	219.05	273.81	M-131
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				806.30	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1424.46	
		<b>Rate per barricade = a+b+c+d</b>				15669.05	
		<b>With Normal Bricks</b>			say	<b>15669.00</b>	
8.44	C	<b>With FLY ASH Bricks</b>				<b>13138.00</b>	Sub_Analysis
8.45	suggestive	<b>Drum Delineator in Construction Zone</b>					
		Provision of metal drum/empty bitumen drum delineator, 300 mm in diameter, 800 mm high, filled with earth for stability, painted in circumferential strips of alternate black and white 100 mm wide fitted with reflectors 3 Nos of 7.5 cm dia, all as per IRC:SP:55-2001					
		<b>Unit = each</b>					
		Taking output = one drum delineator					
		<b>a) Labour</b>					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoor	day	0.250	257.00	64.25	L-13
		Painter	day	0.250	326.00	81.50	L-18
		<b>b) Material</b>					
		Steel drum 300 mm dia 1.2 m high/empty bitumen drum	each	1.000	125.91	125.91	M-172
		Paint	litre	0.500	219.05	109.53	M-131
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				23.20	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				40.98	
		<b>Rate per drum delineator = a+b+c+d</b>				450.80	
					say	<b>451.00</b>	
8.46	suggestive	<b>Flagman</b>					

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Analysis of Rates  
**TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Positioning of a smart flagman with a yellow vest and a yellow cap and a red flag 600 x 600 mm securely fastened to a staff 1 m in length for guiding the traffic					
		<b>Unit = each</b>					
		Taking output = one flagman					
		<b>a) Labour</b>					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor	day	1.000	257.00	257.00	L-13
		<b>b) Material</b>					
		Flag of red color cloth 600 x 600 mm	each	1.000	50.74	50.74	M-099
		Wooden staff for fastening of flag 25 mm dia, one m long	each	1.000	26.23	26.23	M-196
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				20.69	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				36.55	
		<b>Rate per flagman = a+b+c+d</b>				402.10	
					<b>say</b>	<b>402.00</b>	

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# **CHAPTER-9**

# **PIPE CULVERTS**

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## Chapter – 9

### Pipe Culverts

#### Preamble:

1. Pipe culverts of size 1000 mm and 1200 mm dia in single row and double row which are generally used on roads, have been included. Only laying of pipe has been included in the rate. Auxiliary works such as excavation, backfilling, concrete and masonry shall be paid for separately, as provided under the respective clauses.
2. In case of RCC culverts, rates for various items of work involved such as excavation backfilling, masonry, cement concrete etc. have been provided under respective clauses in the chapters on foundation, sub-structures, super-structures and river training and protection works in bridge section of this book.
3. Any river training and protection work like stone pitching, apron, rivetment, curtain wall etc. may be provided under the respective clauses included in Chapter 16 of bridge section.
4. The choice between first class bedding and cement cradle bedding will depend on particular situations and the approved design.
5. The jointing of pipes is proposed by collar joints.
6. Back filling up to 300 mm above top of the pipe shall be carefully done and the soil thoroughly rammed, tamped or vibrated in layers not exceeding 150 mm.
7. Head walls and other ancillary works shall be costed under respective clauses.
8. The height of filling above the top of pipe shall not be less than 600 mm.

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## Summary of Rate Analysis

## CHAPTER - 9

## PIPE CULVERTS

Item No.	Description	Unit	Rate (₹)
9.1	<b>PCC 1:3:6 in Foundation</b> (Plain cement concrete 1:3:6 mix with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	cum	2913.00
9.2	<b>Laying Reinforced Cement Concrete Pipe NP4/prestrssed concrete pipe on first class bedding in single row</b> . (Laying Reinforced cement concrete pipe NP4/prestrssed concrete pipe for culverts on first class bedding of granular material in single row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets.)		
A	<b>1000 mm dia</b>	metre	3397.00
B	<b>1200 mm dia</b>	metre	4829.00
9.3	<b>Laying Reinforced Cement Concrete Pipe NP 4 /prestrssed concrete pipe on first class bedding in double row</b> . (Laying Reinforced cement concrete pipe NP4 /prestrssed concrete pipe for culverts on first class bedding of granular material in double row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets . )		
A	<b>1000 mm dia</b>	metre	6837.00
B	<b>1200 mm dia</b>	metre	9704.00

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Analysis of Rates  
CHAPTER - 9  
PIPE CULVERTS

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
9.1	408	<b>PCC 1:3:6 in Foundation</b>					
		Plain cement concrete 1:3:6 mix with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.640	272.00	174.08	L-12
		Mason	day	1.000	345.00	345.00	L-11
		Mazdoor	day	15.000	257.00	3855.00	L-13
		<b>b) Material</b>					
		40mm Aggregate at site	cum	13.800	441.08	6086.90	M-055
		Sand at site	cum	6.900	150.80	1040.52	M-005
		Cement at site	tonne	3.300	5156.00	17014.80	M-081
		Cost of water	KL	18.000	253.69	4566.42	M-189
		<b>c) Machinery</b>					
		Concrete mixer 0.4/ 0.28 cum	hour	6.000	82.30	493.80	P&M-009
		Generator set 33 KVA	hour	6.000	559.00	3354.00	P&M-079
		Water tanker 6 KL capacity	hour	3.000	183.00	549.00	P&M-060
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				2248.77	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				3972.83	
		Cost for 15 cum = a+b+c+d+e				43701.12	
		<b>Rate per cum = (a+b+c+d+e)/15</b>				2913.41	
					<b>say</b>	<b>2913.00</b>	
		<b>Note</b> Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.					
9.2	2900	<b>Laying Reinforced Cement Concrete Pipe NP4 / Prestressed Concrete Pipe on First Class Bedding in Single Row .</b>					
		Laying Reinforced cement concrete pipe NP4 / prestressed concrete pipe for culverts on first class bedding of granular material in single row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets .					
		<b>Unit = metre</b>					
		<b>Taking output = 12.5 metres ( 5 pipes of 2.5 m length each )</b>					
	<b>A</b>	<b>1000 mm dia</b>					
		<b>a) Labour</b>					
		Mate	day	0.180	272.00	48.96	L-12
		Mason	day	0.500	345.00	172.50	L-11
		Mazdoor	day	4.000	257.00	1028.00	L-13
		<b>b) Material</b>					
		Sand at site	cum	0.070	150.80	10.56	M-005
		Cement at site	tonne	0.050	5156.00	257.80	M-081
		RCC pipe NP-4 /prestressed concrete pipe including collar at site	metre	12.500	2744.50	34306.25	M-149
		Granular material passing 5.6 mm sieve for bedding	cum	4.500	131.53	591.89	M-009
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				2184.96	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				3860.09	
		Cost for 12.5 metres = a+b+c+d				42461.00	
		<b>Rate per metre = (a+b+c+d)/12.5</b>				3396.88	
					<b>say</b>	<b>3397.00</b>	
		<b>Note</b> 1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added .					
		2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections					
9.2	<b>B</b>	<b>1200 mm dia</b>					



Analysis of Rates  
**PIPE CULVERTS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>a) Labour</b>					
		Mate	day	0.280	272.00	76.16	L-12
		Mason	day	1.000	345.00	345.00	L-11
		Mazdoor	day	6.000	257.00	1542.00	L-13
		<b>b) Material</b>					
		Sand at site	cum	0.090	150.80	13.57	M-005
		Cement at site	tonne	0.070	5156.00	360.92	M-081
		RCC pipe NP-4/prestressed concrete pipe including collar at site	metre	12.500	3901.83	48772.88	M-150
		Granular material passing 5-6 mm sieve for class bedding	cum	5.000	131.53	657.65	M-009
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				3106.09	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				5487.43	
		Cost for 12.5 metres = a+b+c+d				60361.69	
		<b>Rate per metre = (a+b+c+d)/12.5</b>				4828.94	
					<b>say</b>	<b>4829.00</b>	
		<b>Note</b>					
		1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added.					
		2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections					
9.3	2900	<b>Laying Reinforced Cement Concrete Pipe NP4 / Prestressed Concrete Pipe on First Class Bedding in Double Row .</b>					
		Laying Reinforced cement concrete pipe NP4 / prestressed concrete pipe for culverts on first class bedding of granular material in double row including fixing collar with cement mortar 1:2 but excluding excavation, protection works, backfilling, concrete and masonry works in head walls and parapets .					
		<b>Unit = metre</b>					
		<b>Taking output = 12.5 metres ( 10 pipes of 2.5 m length each in two rows.)</b>					
	<b>A</b>	<b>1000 mm dia</b>					
		<b>a) Labour</b>					
		Mate	day	0.360	272.00	97.92	L-12
		Mason	day	1.000	345.00	345.00	L-11
		Mazdoor	day	8.000	257.00	2056.00	L-13
		<b>b) Material</b>					
		Sand at site	cum	0.140	150.80	21.11	M-005
		Cement at site	tonne	0.100	5156.00	515.60	M-081
		RCC pipe NP-4/prestressed concrete pipe including collar at site	metre	25.000	2744.50	68612.50	M-149
		Granular material passing 5.6 mm sieve for bedding	cum	12.500	131.53	1644.13	M-009
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				4397.54	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				7768.98	
		Cost for 12.5 metres = a+b+c+d				85458.77	
		<b>Rate per metre = (a+b+c+d)/12.5</b>				6836.70	
		<b>Note</b>				<b>say</b>	<b>6837.00</b>
		1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added.					
		2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections					
9.3		<b>B 1200 mm dia</b>					
		<b>a) Labour</b>					

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# Analysis of Rates

## PIPE CULVERTS

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	0.560	272.00	152.32	L-12
		Mason	day	2.000	345.00	690.00	L-11
		Mazdoor	day	12.000	257.00	3084.00	L-13
		<b>b) Material</b>					
		Sand at site	cum	0.180	150.80	27.14	M-005
		Cement at site	tonne	0.140	5156.00	721.84	M-081
		RCC pipe NP-4 /prestressed concrete pipe including collar at site	metre	25.000	3901.83	97545.75	M-150
		Granular material passing 5-6 mm sieve for class bedding	cum	13.750	131.53	1808.54	M-009
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				6241.78	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				11027.14	
		Cost for 12.5 metres = a+b+c+d				121298.50	
		<b>Rate per metre = (a+b+c+d)/12.5</b>				9703.88	
	<b>Note</b>	1. In case of cement craddle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added .			<b>say</b>	<b><u>9704.00</u></b>	
		2. The rate analysis does not include excavation, cement /masonry works in head walls, backfilling, protection works and parapet walls. The same are to be calculated as per approved design and drawings and priced separately on rates available under respective sections					

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## **CHAPTER-10**

# **MAINTENANCE OF ROADS**

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## **Chapter – 10**

### **Maintenance of Roads**

#### **Preamble:**

1. In the case of rain cuts, it has been assumed that some material cut by rain, approximately 25 per cent, will be available at site which can be retrieved and re-used and the balance 75 per cent is required to be provided as fresh material.
2. For making up earthen shoulder, it has been assumed that on an average 150 mm filling will be required. Similarly, for stripping of excess soil from the shoulder, an average depth of 75 mm has been assumed.
3. In the case of chocking of drain, it has been assumed that half the depth of drain has been filled with earth/debris, which requires clearance.
4. During the process of landslide clearance on hill road, it has been assumed that earth will be disposed off by the dozer on the valley side. In case there is any objection to this arrangement due to particular site conditions, resources like loader and tipper will have to be provided for disposal of earth/debris for the lead involved.
5. Pot-hole repair and patchwork are provided to be done by mechanical means.
6. The items like slurry seal, fog spray, crack prevention courses, surface dressing for maintenance works have already been included in Chapter-5 and are not being repeated in this chapter.
7. The cost of other items like repair of ruts and undulation maintenance of earthen shoulders, cross drainage works, minor and major bridges and miscellaneous items like turfing and arboriculture, painting and lettering on km stones, repair to signage, repair to footpath, street lighting, railing, dividers, separators and under passes for pedestrians has been given in the “Report of the Committee on Norms for Maintenance of Roads in India” published by IRC in January 2001 which may be referred for guidance.
8. The repair items related to bridges have been given in Chapter-16.

  
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Summary of Rate Analysis  
**CHAPTER - 10**  
**MAINTENANCE OF ROADS**

Item No.	Description	Unit	Rate (₹)
10.1	<b>Restoration of Rain Cuts</b> (Restoration of rain cuts with soil, moorum, gravel or a mixture of these, clearing the loose soil, benching for 300 mm width, laying fresh material in layers not exceeding 250 mm and compacting with plate compactor or power rammers to restore the original alignment, levels and slopes.)	cum	125.00
10.2	<b>Maintenance of Earthen Shoulder (filling with fresh soil)</b> (Making up loss of material/irregularities on shoulder to the design level by adding fresh approved soil and compacting it with appropriate equipment.)	sqm	86.00
10.3	<b>Maintenance of Earth Shoulder (stripping excess soil)</b> (Stripping excess soil from the shoulder surface to achieve the approved level and compacting with plate compactor.)	sqm	30.00
10.4	<b>Filling Pot- holes and Patch Repairs with open - graded Premix surfacing, 20mm.</b> (Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 511, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2.)	sqm	122.00
10.5	<b>Filling Pot- holes and Patch Repairs with - Bituminous concrete, 40mm.</b> (Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 504, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2.)		
(i)	<b>for grading I Material</b>	sqm	294.00
(ii)	<b>for grading II Material</b>	sqm	292.00
10.6	<b>Crack Filling</b> (Filling of crack using slow - curing bitumen emulsion and applying crusher dust in case crack are wider than 3mm.)	metre	3.70
10.7	<b>Dusting</b> (Applying crusher dust to areas of road where bleeding of excess bitumen has occurred.)	sqm	0.38
10.8 A	<b>Fog Seal</b> (ref item 5.17)	sqm	36.00
B	<b>Crack Prevention courses.</b> (ref item 5.21)		
(i)	<b>Stress Absorbing Membrane (SAM) crack width less than 6 mm</b>	sqm	47.00
(ii)	<b>Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm</b>	sqm	57.00
(iii)	<b>Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 %</b>	sqm	75.00
(iv)	<b>Bitumen Impregnated Geotextile</b>	sqm	146.00
C	<b>Slurry Seal</b> (ref item 5.15)		
(i)	<b>5 mm thickness</b>	sqm	61.00
(ii)	<b>3 mm thickness</b>	sqm	43.00
(iii)	<b>1.5 mm thickness</b>	sqm	26.60
D	<b>Surface Dressing for maintenance works.</b> (ref item 5.9)		
(i)	<b>19 mm nominal chipping size</b>	sqm	64.00
(ii)	<b>13 mm nominal size chipping</b>	sqm	55.00
10.9	<b>Repair of joint Grooves with Epoxy Mortar</b> Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete.)	metre	684.00
10.10	<b>Repair of old Joints Sealant</b> (Removal of existing sealant and re sealing of contraction, longitudinal or expansion joints in concrete pavement with fresh sealant material.)	metre	22.20
10.11	<b>Hill Side Drain Clearance</b> (Removal of earth from the choked hill side drain and disposing it on the valley side manually.)	metre	32.50
10.12	<b>Land Slide Clearance in soil</b> (Clearance of land slides in soil and ordinary rock by a bull-dozer D 80 A-12, 180 HP and disposal of the same on the valley side.)	cum	112.00
10.13	<b>Land slide Clearance in Hard Rock Requiring Blasting</b> (Clearing of land slide in hard rock requiring blasting for 50% of the boulders and disposal of the same on the valley side.)	cum	295.00
10.14	<b>Snow Clearance on Roads with Dozer</b> (Snow clearance from road surface by a bull- dozer 165 Hp and disposing it on the valley side.)	cum	7.80
10.15	<b>Snow Clearance on Roads with Snow Blowers</b> (Snow clearance from road surface by a snow blower and disposing on the valley side.)	cum	#VALUE!





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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
10.1	3002	<b>Restoration of Rain Cuts</b>					
		Restoration of rain cuts with soil, moorum, gravel or a mixture of these, clearing the loose soil, benching for 300 mm width, laying fresh material in layers not exceeding 250 mm and compacting with plate compactor or power rammers to restore the original alignment, levels and slopes					
		<b>Unit = cum</b>					
		<b>Taking output = 10 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.130	1958.00	254.54	P&M-026
		Tipper ( L is average lead in km for borrow earth)	tonne.km	12 x L	3.47	41.64	Lead =1 km & P&M-058
		Add 10 per cent of cost of carriage towards loading and unloading charges.				4.16	
		Plate compactor	hour	0.500	467.00	233.50	P&M-086
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				64.18	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				113.38	
		Cost for 10 cum = a+b+c+d				1247.16	
		<b>Rate per cum = (a+b+c+d)/10</b>				124.72	
					<b>say</b>	<b>125.00</b>	
		<b>Note</b> Only 75 per cent of fresh material has been provided as 25 per cent can be retrieved at site from earth that is flown down the slope in the form of slurry and deposited at the foot of the rain cuts					
10.2	3003	<b>Maintenance of Earthen Shoulder (filling with fresh soil)</b>					
		Making up loss of material/ irregularities on shoulder to the design level by adding fresh approved soil and compacting it with appropriate equipment.					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		Assuming average thickness of filling to be 150 mm					
		Quantity of fresh material = 15 cum					
		<b>a) Labour</b>					
		Mate	day	0.180	272.00	48.96	L-12
		Mazdoor	day	4.500	257.00	1156.50	L-13
		<b>b) Machinery</b>					
		Excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.250	1958.00	489.50	P&M-026
		Tipper ( L is average lead in km for borrow earth)	tonne.km	24 x L	3.47	83.28	Lead =1 km & P&M-058
		Add 10 per cent of cost of transportation to cover cost of loading and unloading				8.33	
		Plate compactor @ 25 sqm per hour	hour	12.000	467.00	5604.00	P&M-086
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				443.43	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				783.40	
		Cost for 100 sqm = a+b+c+d				8617.40	
		<b>Rate per sqm = (a+b+c+d)/100</b>				86.17	
					<b>say</b>	<b>86.00</b>	
10.3	3003	<b>Maintenance of Earth Shoulder (stripping excess soil)</b>					
		Stripping excess soil from the shoulder surface to achieve the approved level and compacting with plate compactor					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		Assuming average depth of stripping as 75 mm					
		Quantity of earth cutting involved = 7.5 cum					
		<b>a) Labour</b>					
		Mate	day	0.100	272.00	27.20	L-12
		Mazdoor	day	2.500	257.00	642.50	L-13

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Plate compactor @ 25 sqm per hour	hour	4.000	467.00	1868.00	P&M-086
		<b>c) Overhead charges @ 0.06 on (a+b)</b>				152.26	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				269.00	
		Cost for 100 sqm = a+b+c+d				2958.96	
		<b>Rate per sqm on = (a+b+c+d)/100</b>				29.59	
					<b>say</b>	<b>30.00</b>	
		<b>Note</b> The earth stripped from earthen shoulders to be dumped on the side slopes locally for disposal.					
10.4	3004.2	<b>Filling Pot-holes and Patch Repairs with open-Graded Premix surfacing, 20mm.</b>					
		Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 511, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2					
		<b>Unit = Sqm</b>					
		<b>Taking out put = 10250 sqm (205 cum)/(405 tonne)</b>					
		<b>a) Labour</b>					
		Mate	Day	3.760	272.00	1022.72	L-12
		Mazdoor	Day	90.000	257.00	23130.00	L-13
		Mazdoor skilled	Day	4.000	325.00	1300.00	L-15
		<b>b) Machinery</b>					
		Air compressor 250 cfm	hour	6.000	481.00	2886.00	P&M-001
		HMP 100-110 TPH Capacity	hour	6.000	39088.00	234528.00	P&M-022
		Tipper 10 tonnes capacity	hour	45.000	1018.00	45810.00	P&M-048
		Smooth wheeled roller 8-10 tonnes	hour	12.000	781.00	9372.00	P&M-044
		<b>c) Material</b>					
		Crushed stone aggregates nominal size 13.2mm @ 0.18 cum per 10 sqm	cum	184.500	642.67	118572.62	M-052
		Crushed stone aggregates nominal size 11.2mm @ 0.09 cum/10 sqm	cum	92.250	614.17	56657.18	M-051
		Bitumen 80/100 @ 14.6 kg per 10 sqm	tonne	14.970	32030.00	479489.10	M-075
		Bitumen emulsion for tack coat including vertical sides of pot hole.	tonne	2.460	39475.00	97108.50	M-077
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				64192.57	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				113406.87	
		Cost for 10250 sqm = a+b+c+d+e				1247475.55	
		<b>Rate per sqm = (a+b+c+d+e)/10250</b>				121.70	
					<b>say</b>	<b>122.00</b>	
10.5	3004.2	<b>Filling Pot-holes and Patch Repairs with Bituminous concrete, 40mm.</b>					
		Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 504, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2					
		<b>Unit = Sqm</b>					
		<b>Taking out put = 4900 sqm (196 cum)/(450 Tonnes)</b>					
		<b>a) Labour</b>					
		Mate	Day	2.920	272.00	794.24	L-12
		Mazdoor	Day	70.000	257.00	17990.00	L-13
		Mazdoor skilled	Day	3.000	325.00	975.00	L-15
		<b>b) Machinery</b>					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Air compressor 250 cfm	hour	6.000	481.00	2886.00	P&M-001
		HMP 100-110 TPH Capacity	hour	6.000	39088.00	234528.00	P&M-022
		Tipper 10 tonnes capacity	hour	45.000	1018.00	45810.00	P&M-048
		Smooth wheeled roller 8-10 tonnes	hour	12.000	781.00	9372.00	P&M-044
		<b>c) Material</b>					
		i) Bitumen	tonne	22.500	32030.00	720675.00	M-075
		ii) Bitumen emulsion for tack coat .	tonne	1.180	39475.00	46580.50	M-077
		iii) Aggregates					
		<b>Grading I - 19mm (Nominal size)</b>					
		20-10mm 35 per cent	cum	99.750	642.67	64106.33	M-045
		10-5 mm 23 per cent	cum	65.550	528.94	34672.02	M-025,M-040
		5mm and below 40 per cent	cum	114.000	200.45	22851.30	M-030
		Filler 2 per cent by weight of aggregate	tonne	8.620	3555.38	30647.38	M-188
		Add 5 per cent for wastage				1532.37	
		or					
		<b>Grading-II 13mm (Nominal size)</b>					
		13.2-10 mm 30 per cent	cum	85.500	642.67	54948.29	M-044
		10-5 mm 25 per cent	cum	71.250	528.94	37686.98	M-025
		5 mm and Below 43 per cent	cum	122.550	200.45	24565.15	M-030
		Filler 2 per cent	tonne	8.620	3555.38	30647.38	M-188
		Add 5 per cent for wastage				1532.37	
		Any one of the above alternatives of aggregate i.e. 19mm or 13mm nominal size may be adopted as per approved design.					
10.5	(i)	<b>for grading I Material</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				74005.21	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				130742.53	
		Cost for 4900 cum = a+b+c+d+e				1438167.88	
		Rate per cum = (a+b+c+d+e)/4900				293.50	
					say	<u>294.00</u>	
10.5	(ii)	<b>for grading II Material</b>					
		d) Overhead charges @ 0.06 on (a+b+c)				73739.45	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				130273.03	
		Cost for 4900 cum = a+b+c+d+e				1433003.38	
		Rate per cum = (a+b+c+d+e)/4900				292.45	
					say	<u>292.00</u>	
		<b>Note</b> For detailed working of quantities of aggregates, refer item 5.8 of chapter 5					
10.6	3004.3.3	<b>Crack Filling</b>					
		Filling of crack using slow - curing bitumen emulsion and applying crusher dust in case crack are wider than 3mm.					
		<b>Unit = Running Meter</b>					
		<b>Taking out put = 500m</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor	day	1.000	257.00	257.00	L-13
		<b>b) Material</b>					
		Slow-curing bitumen emulsion	Kg	33.000	39.48	1302.68	M-077/1000
		Stone crusher dust	cum	0.020	97.14	1.94	M-021
		c) Overhead charges @ 0.06 on (a+b)				94.35	
		d) Contractor's profit @ 0.1 on (a+b+c)				166.68	
		Cost for 500sqm = a+b+c+d				1833.53	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Rate per meter = (a+b+c+d+e)/500				3.67	
					say	<u>3.70</u>	
10.7	3004.4	Dusting					
		Applying crusher dust to areas of road where bleeding of excess bitumen has occurred.					
		Unit = Sqm					
		Taking output = 3500 sqm					
		a) Labour					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		b) Material					
		Stone crusher dust finer than 3mm with not more than 10 per cent passing 0.075 sieve.	cum	6.250	97.14	607.13	M-021
		c) Overhead charges @ 0.06 on (a+b)				68.57	
		d) Contractor's profit @ 0.1 on (a+b+c)				121.15	
		Cost for 3500sqm = a+b+c+d				1332.60	
		Rate per meter = (a+b+c+d)/3500				0.38	
					say	<u>0.38</u>	
10.8	(A) 3004.3.2	Fog Seal	sqm			36.00	Item 5.17
	(B) 3004.3.4	Crack Prevention courses.					
		(i) Stress Absorbing Membrane (SAM) crack width less than 6 mm	sqm			47.00	Item 5.21 Case-I
		(ii) Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm	sqm			57.00	Item 5.21 Case-II
		(iii) Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 per cent	sqm			75.00	Item 5.21 Case-III
		(iv) Bitumen Impregnated Geotextile	sqm			146.00	Item 5.21 Case-IV
10.8	(C) 3004.5	Slurry Seal					
		(i) 5 mm thickness	sqm			61.00	Item 5.15 Case-I
		(ii) 3 mm thickness	sqm			43.00	Item 5.15 Case-II
		(iii) 1.5 mm thickness	sqm			26.60	Item 5.15 Case-III
10.8	(D) 3004.6	Surface Dressing for maintenance works.					
		(i) 19 mm nominal chipping size	sqm			64.00	Item 5.9 Case-I
		(ii) 13 mm nominal size chipping	sqm			55.00	Item 5.9 Case-II
		The above mentioned items have already been included in chapter 5.					
10.9	3005.1	Repair of Joint Grooves with Epoxy Mortar					
		Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete					
		Unit = running metre					
		Taking output = 10 metres					
		a) Labour					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor	day	0.500	257.00	128.50	L-13
		Chiseller	day	0.500	323.00	161.50	L-05
		b) Material					
		Epoxy primer	kg	2.500	12.59	31.48	M-097

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Epoxy compound with accessories for preparing epoxy mortar	kg	10.000	550.68	5506.80	M-095
		<b>c) Machinery</b>					
		Air compressor 250 cfm for cleaning	hour	0.050	481.00	24.05	P&M-001
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				351.79	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				621.50	
		Cost for 10 metres = a+b+c+d+e				6836.50	
		<b>Rate per metre = (a+b+c+d+e)/10</b>				683.65	
					<b>say</b>	<b>684.00</b>	
10.10	3005.2	<b>Repair of old Joints Sealant</b>					
		Removal of existing sealant and re sealing of contraction, longitudinal or expansion joints in concrete pavement with fresh sealant material					
		<b>Unit = running metre</b>					
		<b>Taking output = 10 metres</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor	day	0.500	257.00	128.50	L-13
		<b>b) Material</b>					
		Primer	kg	0.250	12.07	3.02	M-146
		Sealant	kg	1.000	24.05	24.05	M-120
		<b>c) Machinery</b>					
		Air compressor 250 cfm for cleaning	hour	0.050	481.00	24.05	P&M-001
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				11.43	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				20.19	
		Cost for 10 metres = a+b+c+d+e				222.12	
		<b>Rate per metre = (a+b+c+d+e)/10</b>				22.21	
					<b>say</b>	<b>22.20</b>	
10.11	3000	<b>Hill Side Drain Clearance</b>					
		Removal of earth from the choked hill side drain and disposing it on the valley side manually					
		<b>Unit = running metre</b>					
		<b>Taking output = 10 metres</b>					
		Assuming muck causing choking of drain to be 0.2 cum per metre, quantity of earth to be removed for 10 metres = 2 cum					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	1.000	257.00	257.00	L-13
		<b>b) Overhead charges @ 0.06 on (a+b)</b>				16.73	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				29.55	
		Cost for 10 metres = a+b+c				325.03	
		<b>Rate per metre = (a+b+c)/10</b>				32.50	
					<b>say</b>	<b>32.50</b>	
10.12	3000	<b>Land Slide Clearance in soil</b>					
		Clearance of land slides in soil and ordinary rock by a bulldozer D 80 A-12, 180 HP and disposal of the same on the valley side					
		<b>Unit = cum</b>					
		<b>Taking output = 100 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor	day	1.000	257.00	257.00	L-13
		<b>b) Machinery</b>					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Dozer 80 HP @ 60 cum per hour	hour	1.670	5598.00	9348.66	P&M-014
		c) Overhead charges @ 0.06 on (a+b)				576.99	
		d) Contractor's profit @ 0.1 on (a+b+c)				1019.35	
		Cost for 100 cum = a+b+c+d				11212.89	
		Rate per cum = (a+b+c+d)/100				112.13	
					say	<u>112.00</u>	
		<b>Note</b> Land Slide clearance involves pushing of loose earth slid on the road surface from hill face on the valley side. Since no cutting of original ground is involved, the output of dozer has been taken as 60 cum per hour for soil, ordinary rock and blasted hard rock. However, if there are objection to disposing of earth on valley side, additional resources for its disposal shall be considered as per site conditions.					
10.13	3000	<b>Landslide Clearance in Hard Rock Requiring Blasting</b>					
		Clearing of land slide in hard rock requiring blasting for 50 per cent of the boulders and disposal of the same on the valley side.					
		Unit = cum					
		Taking output = 100 cum					
		a) Labour					
		Mate	day	0.090	272.00	24.48	L-12
		Mazdoor	day	1.500	257.00	385.50	L-13
		Driller	day	0.750	307.00	230.25	L-06
		Blaster	day	0.070	425.00	29.75	L-03
		b) Machinery					
		Dozer D 80 A-12, 180 HP @ 60 cum per hour	hour	1.670	5598.00	9348.66	P&M-014
		Air compressor 250 cfm with two jack hammer	hour	2.500	481.00	1202.50	P&M-001
		c) Materials					
		Gelatine 80 per cent @ 35 kg per 100 cum	kg	17.500	781.83	13682.03	M-104
		Electric Detonators @ 1 Detonator for 2 Gelatine sticks of 125 gms each	each	70.000	5.73	401.00	M-094 /100
		c) Overhead charges @ 0.06 on (a+b)				1518.25	
		d) Contractor's profit @ 0.1 on (a+b+c)				2682.24	
		Cost for 100 cum = a+b+c+d+e				29504.66	
		Rate per cum = (a+b+c+d+e)/100				295.05	
					say	<u>295.00</u>	
		<b>Note</b> Credit for the rock if found acceptable as construction material shall be afforded					
10.14	3000	<b>Snow Clearance on Roads with Dozer</b>					
		Snow clearance from road surface by a bull- dozer 165 Hp and disposing it on the valley side					
		Unit = cum					
		Taking output = 5000 cum					
		a) Labour					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		b) Machinery					
		Dozer D 80 A-12, 180 HP @ 850 cum per hour	hour	5.880	5598.00	32916.24	P&M-014
		c) Overhead charges @ 0.06 on (a+b)				2007.12	
		d) Contractor's profit @ 0.1 on (a+b+c)				3545.91	
		Cost for 5000 cum = a+b+c+d				39005.03	
		Rate per cum = (a+b+c+d)/5000				7.80	
					say	<u>7.80</u>	

12/8/19

Analysis of Rates  
**MAINTENANCE OF ROADS**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Note</b>	i) Labour provided will not be cutting the snow. They will be guiding the dozer operator on the alignment of the road as entire surface gets covered with snow and the edges of the road are not visible and for changing the blade angle. Also they will keep a watch on the hill side for any eventuality of avalanches, slide etc					
10.15	3000		<b>Snow Clearance on Roads with Snow Blowers</b>					
			Snow clearance from road surface by a snow blower and disposing on the valley side.					
			<b>Unit = cum</b>					
			<b>Taking output = 3600 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.080	272.00	21.76	L-12
			Mazdoor	day	2.000	257.00	514.00	L-13
			<b>b) Machinery</b>					
			Snow blower equipment 140 HP @ 600 cum per hour	hour	6.000	input	#VALUE!	P&M-087
			<b>c) Overhead charges @ 0.06 on (a+b)</b>				#VALUE!	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				#VALUE!	
			Cost for 3600 cum (a+b+c+d)				#VALUE!	
			<b>Rate per cum = (a+b+c+d)/3600</b>				#VALUE!	
						say	<b>#VALUE!</b>	

Calc.  
12/8/19





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# **PART - B**

# **HORTICULTURE**

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# **CHAPTER-11**

# **HORTICULTURE**

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# Chapter – 11

## Horticulture

### Preamble:

1. The items of turfing with sods and seeding and mulching have been included in the chapter of earth work.
2. The analysis of rates for grassing of lawns and hedges has been included, as the same may be needed for resting places on highways.
3. Five types of tree guards as under have been provided:
  - a) Half brick circular type
  - b) Tree guards made from empty bitumen drums 1.30 m high
  - c) Tree guards made from empty bitumen drums 2.00 m high
  - d) Tree guards with MS flat iron
  - e) Tree guards with MS angle and 3 mm steel wire welded on MS flat and bolted to angle iron posts

Selection from above may be made as per actual situation and design.

4. Analysis of rates for wrought iron and mild steel welded work has been included to cater for any miscellaneous work in connection with horticulture, fencing and traffic sign.
5. Though the estimate for compensatory afforestation is made by the forest department, the rate for this item has been analysed and included for the purpose of estimation.
6. In the rate analysis of some items, the quantities of sub-items involved in that analysis, like, excavation for foundation, foundation concrete, painting, lettering, etc. have been given. The rates for such items may be taken from relevant chapters where the same have already been analysed.
7. As grass and plantation need more care, one mate has been provided for every 10 mazdoors in case of horticulture.

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12/8/19



# Summary of Rate Analysis

## CHAPTER - 11 HORTICULTURE

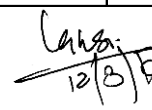
Item No.	Description	Unit	Rate (₹)
11.1	<b>Spreading of Sludge Farm Yard Manure or/and good Earth</b> (Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm- yard manure or/and good earth to be paid for separately).)	cum	20.80
11.2	<b>Grassing with 'Doobs' Grass</b> (Grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed.)		
(i)	<b>In rows 15 cm apart in either direction</b>	sqm	12.00
(ii)	<b>In rows 7.5 cm apart in either direction</b>	sqm	19.30
11.3	<b>Making Lawns including Ploughing and Dragging with 'Swagha' Breaking of Clod</b> (Making lawns including ploughing and breaking of clod, removal of rubbish, dressing and supplying doobs grass roots and planting at 15 cm apart, including supplying and spreading of farm yard manure at rate of 0.18 cum per 100 sqm.)	sqm	13.60
11.4	<b>Maintenance of Lawns or Turfing of Slopes</b> (Maintenance of lawns or Turfing of slopes (rough grassing) for a period of one year including watering etc.)	sqm	336.00
11.5	<b>Turfing Lawns with Fine Grassing including Ploughing, Dressing</b> (Turfing lawns with fine grassing including ploughing, dressing including breaking of clods, removal of rubbish, dressing and supplying doobs grass roots at 10 cm apart, including supplying and spreading of farm yard manure at rate of 0.6 cum per 100 sqm)	sqm	21.00
11.6	<b>Maintenance of Lawns with Fine Grassing for the First Year</b>	sqm	258.00
11.7	<b>a) Planting Permanent Hedges including Digging of Trenches</b> (Planting permanent hedges including digging of trenches, 60 cm wide and 45 cm deep, refilling the excavated earth mixed with farmyard manure, supplied at the rate of 4.65 cum per 100 metres and supplying and planting hedge plants at 30 cm apart.)	metre	366.00
(b)	<b>Maintenance of Hedge for one year</b>	metre	244.00
11.8	<b>a) Planting Flowering Plants and Shrubs in Central Verge</b>	km	96090.00
(b)	<b>Maintenance of Flowering Plants and Shrubs in Central Verge for one Year</b>	km	204616.00
11.9	<b>Planting of Trees and their Maintenance for one Year</b> (Planting of trees by the road side (Avenue trees) in 0.60 m dia holes, 1 m deep dug in the ground, mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year.)	each	1075.00
11.10	<b>Renovation Lawns including, Weeding, Forking the Ground, Top Dressing with Forked Soil</b> (Renovation lawns including, weeding, forking the ground, top dressing with forked soil, watering and maintenance the lawns, for 30 days or more, till the grass forms a thick lawn, free from weeds, and fit for moving and disposal of rubbish as directed, including supplying good earth, if needed but excluding the cost of well decayed farm yard manure.)	sqm	19.30
11.11	<b>Supply at Site Well Decayed Farm Yard Manure</b> (Supply at site of work well decayed farm yard manure, from any available source, approved by the engineer in charge including screening and stacking.)	cum	887.00
11.12	<b>Supply at Site of Work/ Store - Deoiled Neem Cake</b> (Supply at site of work/ store- deoiled neem cake duly packed in used gunny bags.)	quintal	VALUE
11.13	<b>Supplying Sludge</b> (Supplying sludge duly stacked at site/ store.)	cum	VALUE
11.14	<b>Half Brick Circular Tree Guard, in 2nd class Brick, internal diametre 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground</b> (Half brick circular tree guard, in 2nd class brick, internal diametre 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground, bottom two courses laid dry, and top three courses in cement mortar 1:6 (1 cement 6 sand) and the intermediate courses being in dry honey comb masonry, as per design complete.) <b>With Normal bricks</b>	each	1914.00
11.14	<b>Half Brick Circular Tree Guard, in 2nd class Brick, internal diametre 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground</b> (Half brick circular tree guard, in 2nd class brick, internal diametre 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground, bottom two courses laid dry, and top three courses in cement mortar 1:6 (1 cement 6 sand) and the intermediate courses being in dry honey comb masonry, as per design complete.) <b>With FLY ASH bricks</b>	each	1591.00
11.15	<b>Edging with 2nd class Bricks, laid dry lengthwise</b> (Edging with 2nd class bricks, laid dry lengthwise, including excavation, refilling, consolidation, with a hand packing and spreading nearly surplus earth within a lead of 50 metres) <b>With Normal bricks</b>	metre	39.80
11.15	<b>Edging with 2nd class Bricks, laid dry lengthwise</b> (Edging with 2nd class bricks, laid dry lengthwise, including excavation, refilling, consolidation, with a hand packing and spreading nearly surplus earth within a lead of 50 metres) <b>With FLY ASH bricks</b>	metre	32.80

*12/8/19*



### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
11.16	<b>Making Tree Guard 53 cm dia and 1.3 m high as per design from empty bitumen drum</b> (Making tree guard 53 cm dia and 1.3 m high as per design from empty bitumen drum, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets, complete in all respect.)	each	475.00
11.17	<b>Making Tree Guard 53 cm dia and 2 metres high as per design from empty bitumen drums</b> (Making tree guard 53 cm dia and 2 metres high as per design from empty bitumen drums, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing four legs 40 cm long of 30 x 3 mm MS riveted to tree guard and providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets complete in all respects.)	each	944.00
11.18	<b>Wrought Iron and Mild Steel Welded Work (Wrought iron and mild steel welded work)</b> (using angles, square bars, tees and channel grills, grating frames, gates and tree guards of any size and design etc. including cost of screens and welding rods or bolts and nuts complete fixed in position but without the cost of excavation and concrete for fixing which will be paid separately.)	quintal	7380.00
11.19	<b>Tree Guard with MS Iron</b> (Providing and fixing MS iron tree guard 60 cm dia and 2 metre high above ground level formed of 4 Nos (25 x 6 mm) and 8 Nos (25 x 3 mm) vertical MS riveted to 3 Nos (25 x 6 mm) iron rings in two halves, bolted together with 8 mm dia and 30 mm long bolts including painting two coats with paint of approved brand over a coat of priming, complete in all respects.)	each tree guard	1903.00
11.20	<b>Tree Guard with MS Angle Iron and Steel Wire</b> (Providing and fixing tree guard 0.60 metre square, 2.00 metre high fabricated with MS angle iron 30 x 30 x 3 mm, MS iron 25 x 3 mm and steel wire 3 mm dia welded and fabricated as per design in two halves bolted together.)	each tree guard	2463.00
11.21	<b>Compensatory Afforestation</b> (Planting trees as compensatory afforestation at the rate of 290 trees per hectare at a spacing of 6 m by grubbing and leveling the ground upto a depth of 150 mm, digging holes 0.9 m dia, 1 m deep, mixing farm yard/sludge manure with soil, planting of sapling 2 m high with 25 cm dia stem, backfilling the hole and watering.)	hectare	139337.00

  
 12/8/19

Analysis of Rates  
CHAPTER - 11  
**HORTICULTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
11.1	307	<b>Spreading of Sludge Farm Yard Manure or/and good Earth</b>					
		Spreading of sludge farm yard manure or/ and good earth in required thickness (cost of sludge, farm yard manure or/and good earth to be paid for separately)					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor	day	1.000	257.00	257.00	L-13
		<b>b) Overhead charges @ 0.06 on (a)</b>				16.07	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				28.40	
		Cost for 15 cum= a+b+c				312.35	
						20.82	
					<b>say</b>	<b>20.80</b>	
11.2	307	<b>Grassing with 'Doobs' Grass</b>					
		Grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		(i) <b>In rows 15 cm apart in either direction</b>					
		<b>a) Labour</b>					
		Mate	day	0.170	272.00	46.24	L-12
		Mazdoor for grassing	day	0.750	257.00	192.75	L-13
		Mazdoor for maintenance for 30 days	day	1.000	257.00	257.00	L-13
		<b>b) Machinery</b>					
		Water tanker 6 KL capacity	hour	0.500	183.00	91.50	P&M-060
		<b>c) Material</b>					
		Doob grass	kg	100.000	4.38	438.00	M-112
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				61.53	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				108.70	
		Cost for 100 sqm = a+b+c+d+e				1195.72	
		<b>Rate per sqm= (a+b+c+d+e)/100</b>				11.96	
					<b>say</b>	<b>12.00</b>	
11.2		(ii) <b>In rows 7.5 cm apart in either direction</b>					
		<b>a) Labour</b>					
		Mate	day	0.220	272.00	59.84	L-12
		Mazdoor for grassing.	day	1.250	257.00	321.25	L-13
		for maintenance for 30 days	day	1.000	257.00	257.00	L-13
		<b>b) Machinery</b>					
		Water tanker 6 KL capacity	hour	0.750	183.00	137.25	P&M-060

Analysis of Rates  
**HORTICULTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>c) Material</b>					
		Doob grass	kg	200.000	4.38	876.00	M-112
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				99.08	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				175.04	
		Cost for 100 sqm = a+b+c+d+e				1925.46	
		<b>Rate per sqm = (a+b+c+d+e)/100</b>				19.25	
					<b>say</b>	<b>19.30</b>	
		<b>Note</b> In the case of horticulture one mate has been provided for every 10 mazdoors as maintenance of grass and plants require more care.					
11.3	307	<b>Making Lawns including Ploughing and Dragging with 'Swagha' Breaking of Clod</b>					
		Making lawns including ploughing and breaking of clod, removal of rubbish, dressing and supplying doobs grass roots and planting at 15 cm apart, including supplying and spreading of farm yard manure at rate of 0.18 cum per 100 sqm					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.150	272.00	40.80	L-12
		Mazdoor for preparation of ground	day	0.500	257.00	128.50	L-13
		Mali for fetching doobs grass roots and grassing at 15 cm apart	day	1.000	323.00	323.00	L-09
		<b>b) Machinery</b>					
		Water tanker 6 KL capacity	hour	0.500	183.00	91.50	P&M-060
		Tractor with filler	hour	0.010	546.00	5.46	P&M-053
		<b>c) Material</b>					
		Supply of farm yard manure at site of work	cum	0.180	761.11	137.00	M-167
		Fine grass	kg	100.000	4.38	438.00	M-113
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				69.86	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				123.41	
		Cost for 100 sqm = a+b+c+d+e				1357.53	
		<b>Rate per sqm = (a+b+c+d+e)/100</b>				13.58	
					<b>say</b>	<b>13.60</b>	
11.4	307	<b>Maintenance of Lawns or Turfing of Slopes</b>					
		Maintenance of lawns or Turfing of slopes (rough grassing) for a period of one year including watering etc					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		<b>a) Labour</b>					
		Mali	day	10.000	323.00	3230.00	L-09
		<b>b) Machinery</b>					
		Water tanker 6 KL capacity	hour	15.000	183.00	2745.00	P&M-060
		<b>c) Material</b>					
		Cost of water	KL	90.000	253.69	22832.10	M-189

Calc.  
12/8/19

## Analysis of Rates HORTICULTURE

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		d) Overhead charges @ 0.06 on (a+b+c)				1728.43	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				3053.55	
		Cost for 100 sqm = a+b+c+d+e				33589.08	
		Rate per sqm = (a+b+c+d+e)/100				335.89	
					say	<u>336.00</u>	
11.5	307	Turfing Lawns with Fine Grassing including Ploughing, Dressing					
		Turfing lawns with fine grassing including ploughing, dressing including breaking of clods, removal of rubbish, dressing and supplying doobs grass roots at 10 cm apart, including supplying and spreading of farm yard manure at rate of 0.6 cum per 100 sqm					
		Unit = sqm					
		Taking output = 100 sqm					
		a) Labour					
		Mate	day	0.250	272.00	68.00	L-12
		Mazdoor for preparation of ground	day	1.000	257.00	257.00	L-13
		Mali for fetching doobs grass roots hedges and grassing at 10 cm apart	day	1.500	323.00	484.50	L-09
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.500	183.00	91.50	P&M-060
		Tractor with tiller	hour	0.010	546.00	5.46	P&M-053
		c) Material					
		Supply of farm yard manure at site of work @ 0.6 cum per 100 sqm	cum	0.600	761.11	456.67	M-167
		Fine grass	kg	100.000	4.38	438.00	M-113
		d) Overhead charges @ 0.06 on (a+b+c)				108.07	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				190.92	
		Cost for 100 sqm = a+b+c+d+e				2100.11	
		Rate per sqm = (a+b+c+d+e)/100				21.00	
					say	<u>21.00</u>	
11.6	307	Maintenance of Lawns with Fine Grassing for the First Year					
		Maintenance of lawns with fine grassing for the first year including watering etc					
		Unit = sqm					
		Taking output = 100 sqm					
		a) Labour					
		Mali	day	10.000	323.00	3230.00	L-09
		b) Machinery					
		Water tanker 6 KL capacity	hour	20.000	183.00	3660.00	P&M-060
		c) Material					
		Cost of water	KL	60.000	253.69	15221.40	M-189
		d) Overhead charges @ 0.06 on (a+b+c)				1326.68	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				2343.81	
		Cost for 100 sqm = a+b+c+d+e				25781.89	
		Rate per sqm = (a+b+c+d+e)/100				257.82	
					say	<u>258.00</u>	

Analysis of Rates  
**HORTICULTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
11.7	307		<b>Planting and Maintaining of Permanent Hedges</b>					
		(a)	<b>Planting permanent hedges including digging of trenches</b>					
			Planting permanent hedges including digging of trenches, 60 cm wide and 45 cm deep, refilling the excavated earth mixed with farmyard manure, supplied at the rate of 4.65 cum per 100 metres and supplying and planting hedge plants at 30 cm apart					
			<b>Unit = Running metre</b>					
			<b>Taking output = 100metre</b>					
		a)	<b>Labour</b>					
			Mate	day	1.400	272.00	380.80	L-12
			Mazdoor for digging of trench 60 cm wide and 45 cm deep	day	10.000	257.00	2570.00	L-13
			Mazdoor for refilling the excavated earth mixed with cow dung, preparation of ground and digging of plant, from the nursery carriage to site and planting in position	day	4.000	257.00	1028.00	L-13
		b)	<b>Machinery</b>					
			Water tanker 6 KL capacity	hour	0.500	183.00	91.50	P&M-060
		c)	<b>Material</b>					
			Cost of hedge plants 2 rows at 30 cm apart	each	2x340	33.83	23004.40	M-116
			Supply of farm yard manure at site of work	cum	4.670	761.11	3554.38	M-167
			Pesticide	kg	0.250	75.60	18.90	M-136
			Cost of water	KL	3.000	253.69	761.07	M-189
		d)	<b>Overhead charges @ 0.06 on (a+b+c)</b>				1884.54	
		e)	<b>Contractor's profit @ 0.1 on (a+b+c+d)</b>				3329.36	
			Cost for 100 metres = a+b+c+d+e				36622.96	
			<b>Rate per metre = a+b+c+d+e)/100</b>				366.23	
						<b>say</b>	<b>366.00</b>	
		(b)	<b>Maintenance of hedge for one year</b>					
			<b>Unit = Running metre</b>					
			<b>Taking output = 100 m</b>					
		a)	<b>Labour</b>					
			Mate	day	3.000	272.00	816.00	L-12
			Mazdoor	day	30.000	257.00	7710.00	L-13
		b)	<b>Machinery</b>					
			Water tanker 6 KL capacity	hour	5.000	183.00	915.00	P&M-060
		c)	<b>Material</b>					
			Manure sludge/Farm yard manure	cum	2.000	761.11	1522.22	M-167
			Pesticide	kg	0.500	75.60	37.80	M-136
			Cost of water	KL	30.000	253.69	7610.70	M-189
			Cost of hedge plants @ 10 per cent casualty	each	68.000	33.83	2300.44	M-116
		d)	<b>Overhead charges @ 0.06 on (a+b+c)</b>				1254.73	
		e)	<b>Contractor's profit @ 0.1 on (a+b+c+d)</b>				2216.69	
			Cost for 100 metres = a+b+c+d+e				24383.58	
			<b>Rate per metre = a+b+c+d+e)/100</b>				243.84	
						<b>say</b>	<b>244.00</b>	

Calc.  
12/8/19

## Analysis of Rates HORTICULTURE

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
11.8	307		Planting and Maintaining of Flowering Plants and Shrubs					
		(a)	Planting flowering plants and shrubs in central verge					
			<i>Unit = Running metres 200 plants and 800 shrubs in two rows in one km length of road where width of verge is 3m and above.</i>					
			<i>Taking output = 1000 metres</i>					
		a)	Labour					
			Mate	day	1.200	272.00	326.40	L-12
			Mazdoor	day	12.000	257.00	3084.00	L-13
		b)	Machinery					
			Water tanker 6 KL capacity	hour	6.000	183.00	1098.00	P&M-060
		c)	Material					
			Plants	each	200.000	33.83	6766.00	M-100
			Shrubs	each	800.000	16.91	13528.00	M-166
			Manure sludge/Farm yard manure	cum	63.640	761.11	48437.04	M-167
			Pesticide	kg	0.500	75.60	37.80	M-136
			Cost of water	KL	36.000	253.69	9132.84	M-189
		d)	Overhead charges @ 0.06 on (a+b+c)				4944.60	
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				8735.47	
			Rate per Km = (a+b+c+d+e)				96090.15	
						say	<u>96090.00</u>	
11.8		(b)	Maintenance of flowering plants and shrubs in central verge for one year					
			<i>Unit = km</i>					
			<i>Taking output = one km</i>					
		a)	Labour					
			Mate	day	36.000	272.00	9792.00	L-12
			Mazdoor	day	365.000	257.00	93805.00	L-13
		b)	Machinery					
			Water tanker 6 KL capacity	hour	90.000	183.00	16470.00	P&M-060
		c)	Material					
			Manure Sludge / farm yard manure at site	cum	10.000	761.11	7611.10	M-167
			Cost of water	KL	180.000	253.69	45664.20	M-189
			Replacement of casualties @ 10 per cent					
			Plants	each	20.000	33.83	676.60	M-100
			Shrubs	each	80.000	16.91	1352.80	M-166
			Pesticides	kg	1.500	75.60	113.40	M-136
		d)	Overhead charges @ 0.06 on (a+b+c)				10529.11	
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				18601.42	
			Rate per Km for one year = (a+b+c+d+e)				204615.63	
						say	<u>204616.00</u>	
11.9	307		Planting of Trees and their Maintenance for one Year					

## Analysis of Rates HORTICULTURE

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Planting of trees by the road side (Avenue trees) in 0.60 m dia holes, 1 m deep dug in the ground, mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year					
		<b>Unit = Each</b>					
		<b>Taking output = 10 trees</b>					
		<b>a) Labour</b>					
		Mate	day	1.700	272.00	462.40	L-12
		Mazdoor for planting	day	2.000	257.00	514.00	L-13
		Mazdoor for maintenance for one year	day	15.000	257.00	3855.00	L-13
		<b>b) Machinery</b>					
		Water tanker 6 KL capacity	hour	2.000	183.00	366.00	P&M-060
		<b>c) Material</b>					
		Sapling 2 m high 25 mm dia	each	10.000	22.56	225.60	M-160
		Farm yard manure	cum	0.940	761.11	715.44	M-167
		Pesticide	kg	0.500	75.60	37.80	M-136
		Cost of water	KL	12.000	253.69	3044.28	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				553.23	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				977.38	
		Cost for 10 trees = a+b+c+d+e				10751.13	
		<b>Rate per trees = (a+b+c+d+e)/10</b>				1075.11	
					<b>say</b>	<b>1075.00</b>	
11.10	308	<b>Renovation Lawns including, Weeding, Forking the Ground, Top Dressing with Forked Soil</b>					
		Renovation lawns including, weeding, forking the ground, top dressing with forked soil, watering and maintenance the lawns, for 30 days or more, till the grass forms a thick lawn, free from weeds, and fit for moving and disposal of rubbish as directed, including supplying good earth, if needed but excluding the cost of well decayed farm yard manure					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.120	272.00	32.64	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		<b>b) Machinery</b>					
		Water tanker 6 KL capacity	hour	0.500	183.00	91.50	P&M-060
		<b>c) Material</b>					
		Cost of water	KL	3.000	253.69	761.07	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				99.37	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				175.56	
		Cost for 100 sqm = a+b+c+d+e				1931.14	
		<b>Rate per sqm = (a+b+c+d+e) / 100</b>				19.31	
					<b>say</b>	<b>19.30</b>	
11.11	308.2	<b>Supply at Site Well Decayed Farm Yard Manure</b>					
		Supply at site of work well decayed farm yard manure, from any available source, approved by the engineer in charge including screening and stacking					

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Analysis of Rates  
**HORTICULTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<i>Unit = cum</i>					
		<i>Taking output = one cum</i>					
		<b>a) Material</b>					
		a) Cost of well decayed farm yard manure duly screened, loading, carriage, unloading and stacking at site	cum	1.000	761.11	761.11	M-167
		b) Overhead charges @ 0.06 on (a)				45.67	
		c) Contractor's profit @ 0.1 on (a+b)				80.68	
		Rate per cum = (a+b+c)				887.45	
						<u>887.00</u>	
11.12	308.20	Supply at Site of Work/ Store-Deoiled Neem Cake					
		Supply at site of work/ store-deoiled neem cake duly packed in used gunny bags					
		<i>Unit = quintal</i>					
		<i>Taking output = one quintal</i>					
		a) Cost, carriage, loading, unloading and stacking in store/site	quintal	1.000			
		b) Overheads @ per cent on (a)					
		c) Contractor's profit @ per cent on (a+b)					
		Rate per quintal = a+b+c				VALUE	
11.13	308.2	Supplying Sludge					
		Supplying sludge duly stacked at site/ store					
		<i>Unit = cum</i>					
		<i>Taking output = one cum</i>					
		a) Cost of sludge including carriage, loading, unloading and stacking at site	cum	1.000			
		b) Overheads @ per cent on (a)					
		c) Contractor's profit @ per cent on (a+b)					
		Rate per cum = a+b+c				VALUE	
11.14		New Half Brick Circular Tree Guard, in 2nd Class Brick, internal diameter 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground					
		Half brick circular tree guard, in 2nd class brick, internal diameter 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground, bottom two courses laid dry, and top three courses in cement mortar 1:6 (1 cement 6 sand) and the intermediate courses being in dry honey comb masonry, as per design complete					
		<i>Unit = Each</i>					
		<i>Taking output = one tree guard</i>					
		<b>a) Labour</b>					
		Mate	day	0.050	272.00	13.60	L-12
		Mason	day	0.250	345.00	86.25	L-11
		Mazdoor	day	0.250	257.00	64.25	L-13
		<b>b) Material</b>					
		Brick 2nd class including carriage	each	230.000	6.214	1429.22	M-079
		Cement mortar 1:6	cum	0.025	1929.00	48.23	Item 12.6 (D)



Analysis of Rates  
**HORTICULTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		c) Overhead charges @ 0.06 on (a+b)				98.49	
		d) Contractor's profit @ 0.1 on (a+b+c)				174.00	
		Rate per tree Guard = a+b+c+d				1914.04	
		<i>With Normal bricks</i>			say	<u>1914.00</u>	
11.14		<b>With FLY ASH Bricks</b>				<u>1591.00</u>	<i>Sub_Analysis</i>
11.15	New	<b>Edging with 2nd Class Bricks, Laid Dry Lengthwise</b>					
		Edging with 2nd class bricks, laid dry lengthwise, including excavation, refilling, consolidation, with a hand packing and spreading nearly surplus earth within a lead of 50 metres					
		<i>Unit = Metre</i>					
		<i>Taking output= 10 metres</i>					
		a) Labour					
		Mate	day	0.002	272.00	0.54	L-12
		Mason	day	0.050	345.00	17.25	L-11
		Mazdoor	day	0.050	257.00	12.85	L-13
		b) Material					
		Brick 2nd class including carriage	each	50.000	6.214	310.70	M-079
		c) Overhead charges @ 0.06 on (a+b)				20.48	
		d) Contractor's profit @ 0.1 on (a+b+c)				36.18	
		Cost for 10 metre = a+b+c+d				398.01	
		Rate per metre = (a+b+c+d)/10				39.80	
		<i>With Normal bricks</i>			say	<u>39.80</u>	
11.15		<b>With FLY ASH Bricks</b>				<u>32.80</u>	<i>Sub_Analysis</i>
11.16	New	<b>Making Tree Guard 53 cm dia and 1.3 m High as per Design from Empty Bitumen Drums</b>					
		Making tree guard 53 cm dia and 1.3 m high as per design from empty bitumen drum, slit suitably to permit sun and air, (supplied by the department at stock issue rate) including providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets, complete in all respect					
		<i>Unit = Each</i>					
		<i>Taking output = one tree guard</i>					
		a) Labour					
		Mate	day	0.020	272.00	5.44	L-12
		Blacksmith	day	0.150	345.00	51.75	L-02a
		Mazdoor	day	0.070	257.00	17.99	L-13
		b) Material					
		Empty bitumen drum	each	1.000	125.91	125.91	M-172
		MS sheet 50 x 0.5 mm	kg	0.650	44.927	29.20	M-179 /1000
		Rivets 6 mm dia and 10 mm in length	each	22.000	8.04	176.88	M-158
		c) Overhead charges @ 0.06 on (a+b)				24.43	
		d) Contractor's profit @ 0.1 on (a+b+c)				43.16	

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## Analysis of Rates HORTICULTURE

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Rate for each tree guard = a+b+c+d				474.76	
						say	<u>475.00</u>	
11.17		New	<b>Making Tree Guard 53 cm dia and 2 Metre High as per Design from Empty Bitumen Drums</b>					
			Making tree guard 53 cm dia and 2 metres high as per design from empty bitumen drums, slit suitably to permit sun and air, ( supplied by the department at stock issue rate) including providing and fixing four legs 40 cm long of 30 x 3 mm MS riveted to tree guard and providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets complete in all respects					
			<b>Unit = Each</b>					
			<b>Taking output = one tree guard</b>					
			<b>a) Labour</b>					
			Mate		0.040	272.00	10.88	L-12
			Blacksmith	day	0.200	345.00	69.00	L-02a
			Mazdoor		0.200	257.00	51.40	L-13
			<b>b) Material</b>					
			Empty bitumen drum	each	1.500	125.91	188.87	M-172
			MS sheet 50 x 0.5 mm	kg	0.650	44.927	29.20	M-179 /1000
			Rivets 6 mm dia and 10 mm in length	each	50.000	8.04	402.00	M-158
			MS plate 30 x 3 mm	kg	1.300	44.927	58.41	M-179 /1000
			<b>c) Overhead charges @ 0.06 on (a+b)</b>				48.59	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				85.83	
			Rate for each tree guard = a+b+c+d				944.17	
						say	<u>944.00</u>	
11.18		New	<b>Wrought Iron and Mild Steel Welded Work</b>					
			Wrought iron and mild steel welded work (using angles, square bars, tees and channel grills, grating frames, gates and tree guards of any size and design etc. including cost of screens and welding rods or bolts and nuts complete fixed in position but without the cost of excavation and concrete for fixing which will be paid separately					
			<b>Unit = quintal</b>					
			<b>Taking output = one quintal</b>					
			<b>a) Labour</b>					
			Mate	day	0.450	272.00	122.40	L-12
			Blacksmith/ welder for cutting to design and shape and jointing	day	2.000	345.00	690.00	L-02a
			Mazdoor for fixing and helper for Blacksmith/welder	day	2.500	257.00	642.50	L-13
			<b>b) Material</b>					
			Angle, tees, channels etc	quintal	1.050	4492.70	4717.34	M-179 /10
			Deduct the cost of scrap	quintal	0.050	-1497.57	(74.88)	M-179/10/3
			Add 5 per cent of cost of material for welding rods and other welding accessories				232.12	
			<b>c) Overhead charges @ 0.06 on (a+b)</b>				379.77	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				670.92	
			Rate per quintal = a+b+c+d				7380.17	
						say	<u>7380.00</u>	

## Analysis of Rates HORTICULTURE

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
11.19		New	<b>Tree Guard with MS Iron</b>					
			Providing and fixing MS iron tree guard 60 cm dia and 2 metre high above ground level formed of 4 Nos (25 x 6 mm) and 8 Nos (25 x 3 mm) vertical MS riveted to 3 Nos (25 x 6 mm) iron rings in two halves, bolted together with 8 mm dia and 30 mm long bolts including painting two coats with paint of approved brand over a coat of priming, complete in all respects.					
			<b>Unit = Each</b>					
			<b>Taking output = one tree guard</b>					
			<b>a) Labour</b>					
			Mate	day	0.050	272.00	13.60	L-12
			Blacksmith	day	0.250	345.00	86.25	L-02a
			Mazdoor	day	0.250	257.00	64.25	L-13
			<b>b) Material</b>					
			MS iron 25 x 6 mm	kg	19.200	44.927	862.60	M-179 /1000
			MS iron 25 x 3 mm	kg	9.600	44.927	431.30	M-179 /1000
			Add 5 per cent of cost of material for riveting, bolting and welding accessories				64.69	
			<b>c) Machinery</b>					
			Tractor-trolley	hour	0.040	546.00	21.84	P&M-053
			<b>d) Painting</b>					
			Painting two coats including priming	sqm	1.770	57.80	102.31	Item 8.9
			<b>e) Overhead charges @ 0.06 on (a+b+c)</b>				92.67	
			<b>f) Contractor's profit @ 0.1 on (a+b+c+e)</b>				163.72	
			<b>Rate per tree guard =a+b+c+d+e+f</b>				1903.23	
						<b>say</b>	<b>1903.00</b>	
		<b>Note</b>	1 The items of excavation and concreting to be measured and paid separately as per design .					
			2 . Rate of painting may be adopted from the chapter as Traffic signs.					
11.20		New	<b>Tree Guard with MS Angle Iron and Steel Wire</b>					
			Providing and fixing tree guard 0.60 metre square, 2.00 metre high fabricated with MS angle iron 30 x 30 x 3 mm, MS iron 25 x 3 mm and steel wire 3 mm dia welded and fabricated as per design in two halves bolted together					
			<b>Unit = Each</b>					
			<b>Taking output = one tree guard</b>					
			<b>a) Labour</b>					
			Mate	day	0.050	272.00	13.60	L-12
			Blacksmith	day	0.250	345.00	86.25	L-02a
			Welder	day	0.250	386.00	96.50	L-02b
			Mazdoor	day	0.250	257.00	64.25	L-13
			<b>b) Material</b>					
			MS angle 30 x 30 x 3 mm	kg	13.500	44.927	606.51	M-179 /1000
			MS iron 25 x 3 mm	kg	18.000	44.927	808.69	M-179 /1000
			Steel wire 3 mm dia	kg	6.000	42.86	257.16	M-192

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## Analysis of Rates HORTICULTURE

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Add 5 per cent of cost of material for riveting, bolting and welding accessories				83.62	
			<b>c) Machinery</b>					
			Tractor-trolley	hour	0.040	546.00	21.84	P&M-053
			<b>d) Painting</b>					
			Painting two coats including priming	sqm	1.500	57.80	86.70	Item 8.9
			<b>e) Overhead charges @ 0.06 on (a+b+c)</b>				122.31	
			<b>f) Contractor's profit @ 0.1 on (a+b+c+e)</b>				216.07	
			<b>Rate per tree guard = a+b+c+d+e+f</b>				2463.50	
						<b>say</b>	<b>2463.00</b>	
11.21		New	<b>Compensatory Afforestation</b>					
			Planting trees as compensatory afforestation at the rate of 290 trees per hectare at a spacing of 6 m by grubbing and leveling the ground upto a depth of 150 mm, digging holes 0.9 m dia, 1 m deep, mixing farm yard/sludge manure with soil, planting of sapling 2 m high with 25 cm dia stem, backfilling the hole and watering					
			<b>Unit = Hectare</b>					
			<b>Taking output = one hectare</b>					
			<b>a) Labour</b>					
			<b>i) Planting</b>					
			Mate	day	2.500	272.00	680.00	L-12
			Mazdoor	day	25.000	257.00	6425.00	L-13
			<b>ii) For Maintenance for one year</b>					
			Mate	day	5.000	272.00	1360.00	L-12
			Mazdoor	day	50.000	257.00	12850.00	L-13
			<b>b) Machinery</b>					
			Dozer 80 HP @ 1000 sqm/hour	hour	10.000	3319.00	33190.00	P&M-015
			Water tanker 6 KL capacity (for planting)	hour	3.000	183.00	549.00	P&M-060
			Water tanker 6 KL capacity (for maintenance)	hour	25.000	183.00	4575.00	P&M-060
			<b>c) Material</b>					
			Sapling 1 to 1.5 m high 2 cm dia stem	each	290.000	18.05	5233.92	M-160 x 0.8
			Add 10 per cent of sapling	each	29.000	18.05	523.39	M-160 x 0.8
			Decayed farm yard/sludge manure (planting)	cum	60.900	761.11	46351.60	M-167
			Decayed farm yard/sludge manure (maintenance)	cum	4.000	761.11	3044.44	M-167
			Pesticides for planting	kg	0.500	75.60	37.80	M-136
			Pesticides for maintenance	kg	1.500	75.60	113.40	M-136
			Cost of water	KL	18.000	253.69	4566.42	M-189
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				7170.00	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				12667.00	
			<b>Rate per hectare = a+b+c+d+e</b>				139336.97	
						<b>say</b>	<b>139337.00</b>	
		Note	Cost of fencing to be provided as per size of plot and approved design, measured and paid separately					



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**PART - C**  
**BRIDGE WORKS**

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## C. Bridge Works

# Basic Approach for the preparation of Standard Data Book

The basic approach for the preparation of Standard Data Book for Bridge Works is indicated as under:

### Description of items

The description of items is given briefly and linked with the relevant clause of the Ministry's Specifications for Road and Bridge Works, which may be referred for detailed description, provisions and interpretation.

### Overhead Charges

The overhead charges include the following elements:

1. Site accommodation, setting up plant, access road, water supply, electricity and general site arrangements.
2. Office furniture, equipment and communications.
3. Expenditure on
  - a) Corporate office of contractor
  - b) Site supervision
  - c) Documentation and "as built" drawings
4. Mobilisation / de-mobilisation of resources
5. Labour camps with minimum amenities and transportation to work sites
6. Light vehicles for site supervision including administrative and managerial requirements
7. Laboratory equipment and quality control including field and laboratory testing
8. Minor T&P and survey instruments and setting out work, including verification of line, dimensions, trial pits and bore holes, where required
9. Watch and ward
10. Traffic management during construction
11. Expenditure on safeguarding environment
12. Sundries
13. Financing Expenditure
14. Sales/Turn over tax
15. Work Insurance/compensation.

For the purpose of calculation of overhead charges, the bridge projects may be categorized into three basic types depending upon width of carriageway, length of the bridge and the present cost.

**Category 1 :** Major Bridges including State of Art Bridges and Minor Bridges 25%

**Category 2 :** Minor Bridges included in the Road Package 20%

**Category 3 :** Rehabilitation of Bridges 30%



For the bridge having more than two lanes, equivalent length and cost can be adjusted accordingly.

### **Contractor's Profit**

Contractor's profit has been taken uniformly as 10 percent, over the cost of items including overhead charges.

### **Basic Inputs**

In the Standard Data book only basic inputs for material, labour and machinery/equipments are given. The rates for material and labour are to be obtained from local authorities for the area where the project is located.

### **Plant and Equipment**

The usage/hire charges of machinery/equipment have been worked out based upon present cost of equipments, repairs, POL and operational charges as indicated in Chapter-17. These charges are applicable for base year 2001-2002. For subsequent years, these are required to be escalated depending upon the market situation.

In the analysis of rates, for any items of work, capacity of equipment with corresponding output has been indicated which is most common in use for estimation purpose. Seeing the volume of job, different capacity equipment with corresponding output as indicated in Chapter-17 can be provided for preparing the estimate.

### **Materials**

The rates of material should include basic cost at crushing units, cost of carriage including loading and unloading and stacking of material at site of work and shall be determined through market enquiries.

### **Labour**

For labour, the general classification is mazdoor for unskilled labour and mason/fitter/blacksmith etc. for skilled labour.

One mate has been provided for 25 labourers

### **Carriage of Materials**

The unit for vehicle for carriage has been taken as under.

- a) In hours where lead is defined including time required for loading and unloading.

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- b) In tonne km where lead is variable. The loading and unloading for such cases are to be have been provided separately.

## **General**

Bridge bearing and expansion joints are readymade items commercially produced by specialized firms and in certain cases using imported technology and parts. The rates of these items are obtained directly from different manufacturers approved by Ministry and shall be adopted after comparison.

Normal method of curing has been covered in the schedule. Analysis for steam curing has been included in the analysis of pre-cast concrete PSC beams.

The testing of materials and finished items of work is covered under overhead charges.

Traffic arrangements during construction are covered under overhead charges. Provision of a temporary division, where required shall be governed by Clause 112.3.

In the items for well foundation, provision for nominal island/temporary protection, deep islands/cofferdams with wooden ballies and sheet piles has been made.

For innovative type of structures like cable stayed bridges, suspension bridges, arch bridges, bow string girder bridges, erected by innovative techniques where erection stage is as important as the construction of bridge components in terms of input of machinery, manpower and materials, special analysis is called for.

For some of the items, certain size/specifications have been assumed. If size/specifications other than the same are adopted, corresponding modifications may be made in the inputs of analysis.

The item does not cover all components of bridge projects for all situations. There may be specialized items for specific cases, which need to be analysed keeping in view the basic approach.

## **Guide Bund**

The items for the guide bund are excavation, embankment and protection works. The rates for these items may be taken from the respective chapters.

In case bridge construction works are to be done on wide and deep water channels in major rivers or in sea creeks etc., provision of floating barrages etc. for taking the construction materials and equipments inside water shall also be made separately.

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Analysis for sinking of wells cover diameters from 6 m to 12 and Twin D Type of size 12 m x 6 m. For other shapes like rectangular or any other size, the rates of sinking may be worked out on pro-rata basis.

The lift for casting of concrete in well steining may be 2 to 2.5 m restricting the free fall of concrete to 1.5 m and concreting layer to 450 mm.

The Standard Data Book is for Department use only. It can not be produced in Court of Law as reference/authority and this is a privilege document.

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# **CHAPTER-12**

# **FOUNDATION**

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## Chapter – 12

### Foundation

#### Preamble:

1. Excavation for structures has been provided both by manual and mechanical means. The rate relevant to a particular situation may be adopted.
2. The earth excavated from foundation has been proposed to be backfilled and balance quantity utilized for road work locally except for marshy soil where disposal has been provided.
3. The rock foundations are required to be prepared which has been analysed.
4. In case of rocks, excavation has been considered up to a depth of 3 m only.
5. Embedment of foundation in soft and hard rocks has been provided as required by the specifications.
6. Dewatering has been provided in excavation for foundation. In case dewatering is not required for a particular site condition, the same may be omitted.
7. Mixing of cement concrete has been considered both by using concrete mixer and batching plant. The rate can be adopted depending upon availability of equipment and as approved by the Engineer.
8. Concrete batching plant is generally placed within one km of the bridge site. In case of longer lead, transportation cost may be worked out based on tonne km.
9. The coarse and fine aggregate for cement concrete shall be as per IS:383.
10. Description of items has been given very briefly. Relevant clauses of MoRT&H Specifications may be referred for detailed specification.
11. The rate analysis for well foundation has been included for diameter varying from 6 m to 12 m. Well for twin D type has also been included.
12. Pneumatic sinking is a specialised job. All safety precaution as per IS:4138 are required to be taken. Medical supervision for such works is considered very essential. Depth of pneumatic sinking has been restricted to 30 m below normal water level.
13. Rate analysis for various type of piles like bored cast-in-situ, driven precast RCC pile and driven steel piles of H section have been included. If the steel casing in case of driven pile is required to be retained, the same is required to be priced separately.
14. Pile driving rigs including vibratory hammers are assumed to be self contained with power unit and necessary accessories required for driving.

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15. The quantity of concrete which is required to be stripped off up to a minimum height of 600 mm above the designed top level of the pile has been taken into account in the rate analysis.
16. The amount indicated for testing of piles is for the base year 2001-2002. For subsequent years, these are required to be escalated depending upon market situation.
17. The leveling course below the pile cap is proposed with M 15 grade concrete.
18. Steel reinforcement for cement concrete works are required to be provided separately. The rate for the same has been analysed.
19. Appendix-4 of IRC: 78-2000 may be referred regarding precautions to be taken during sinking of wells.
20. In case of blasting during sinking of wells the inner face of the curb is required to be protected with the steel plates of thickness not less than 10 mm up to top level of well curb. For height above top of curb, the thickness of steel plate may be reduced to 6 mm. This extra height of steel lining should be limited to 3 m.
21. The concrete mix used in bottom plug shall have minimum cement content of 330 kg/cum and a slump of about 150 mm to permit easy flow of concrete through tremie to fill-up all cavities.
22. Necessary safety precautions shall be taken for excavation on open foundations for which guidance may be taken from IS: 3764.
23. A leveling course of 100 mm thickness in M 10 (1:3:6) shall be provided before laying open foundations.
24. In the case of open foundation, dewatering shall not be permitted from the time of placing of concrete up to 24 hours after placement.
25. In case of open foundations in rock, the trenches around the footing shall be filled-up with concrete of M 15 grade up to a level of 0.6 m for hard rock and 1.5 m for soft rock above the foundation level. The portion above this may be filled by boulders grouted with cement.
26. When there are two or more compartments in a well, the lower edge of the cutting edge of the middle stems of such wells shall be kept about 300 mm above that of outer stems to prevent rocking.
27. The well curb shall be in RCC of mix not leaner than M 25 grade with minimum steel reinforcement of 72 kg/cum excluding bond rods.
28. The top of the bottom plug shall be at least 300 mm above top of curb.
29. No dewatering shall be carried out within 7 days of casting of bottom plug.
30. In case of cement concrete piles, the minimum grade of concrete shall be M 35 with minimum cement content of 400 kg/cum.
31. The top of the pile shall project 50 mm into the pile cap and reinforcement of pile shall be fully anchored in pile cap.

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32. The minimum thickness of pile cap should be at least 0.6 m or 1.5 times the diameter of the pile whichever is more.
33. Guidance for piles is to be obtained from IS: 2911.
34. Concrete in driven cast-in-situ piles shall be cast up to a minimum height of 600 mm above the designed top level of pipe, which shall be stripped off to obtain sound concrete either before final set or after 3 days.

*Ans.*  
12/3/19





# Summary of Rate Analysis

## CHAPTER - 12 FOUNDATION

Item No.	Description	Unit	Rate (₹)
12.1	<b>Excavation for Structures</b> (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.)		
I	<b>Ordinary soil</b>		
A	<b>Manual Means</b>		
(i)	<b>Upto 3 m depth</b>	cum	125.00
(ii)	<b>3 m to 6 m depth</b>	cum	160.00
(iii)	<b>Above 6 m depth</b>	cum	214.00
B	<b>Mechanical Means</b>		
(i)	<b>Depth upto 3 m</b>	cum	77.00
(ii)	<b>Depth 3 m to 6 m</b>	cum	88.00
(iii)	<b>Depth above 6m</b>	cum	107.00
II	<b>Ordinary rock (not requiring blasting)</b>		
A	<b>Manual Means</b>		
(i)	<b>Depth upto 3 m</b>	cum	178.00
B	<b>Mechanical Means</b>	cum	99.00
III	<b>Hard rock ( requiring blasting )</b>		
A	<b>Manual Means</b>	cum	760.00
IV	<b>Hard rock ( blasting prohibited )</b>		
A	<b>Mechanical Means</b>	cum	562.00
V	<b>Marshy soil</b>		
(i)	<b>upto 3 m depth</b>		
A	<b>Manual means</b>	cum	551.00
B	<b>Mechanical Means</b>	cum	177.00
VI	<b>Back Filling in Marshy Foundation Pits</b>	cum	421.00
12.2	<b>Filling Annular Space Around Footing in Rock</b> (Lean cement concrete 1:3:6 nominal mix. Rate may be taken as per items 13.4.)		
12.3	<b>Sand Filling in Foundation Trenches as per Drawing &amp; Technical Specification</b>	cum	293.00
12.4	<b>PCC 1:3:6 in Foundation</b> (Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.)	cum	3364.00
12.5	<b>Brick masonry work in cement mortar in foundation complete excluding pointing and plastering, as per drawing and technical specifications</b>		
	<i>With Normal Bricks</i>		
(i)	<b>Rate for Brick Work in C. M. 1:2 in foundation</b>	cum	6314.00
(ii)	<b>Rate for Brick Work in C. M. 1:3 in foundation</b>	cum	6053.00
(iii)	<b>Rate for Brick Work in C. M. 1:4 in foundation</b>	cum	5875.00
(iv)	<b>Rate for Brick Work in C. M. 1:6 in foundation</b>	cum	5701.00
	<i>With FLY ASH Bricks</i>		
(i)	<b>Rate for Brick Work in C. M. 1:2 in foundation</b>	cum	5511.00
(ii)	<b>Rate for Brick Work in C. M. 1:3 in foundation</b>	cum	5250.00
(iii)	<b>Rate for Brick Work in C. M. 1:4 in foundation</b>	cum	5072.00
(iv)	<b>Rate for Brick Work in C. M. 1:6 in foundation</b>	cum	4898.00
12.6 A	<b>Cement mortar 1:3 (1cement :3 sand)</b>	cum	3030.00
B	<b>Cement mortar 1:2 (1cement :2 sand)</b>	cum	3848.00
C	<b>Cement mortar 1:4 (1cement :4 sand)</b>	cum	2473.00
D	<b>Cement mortar 1:6 (1cement :6 sand)</b>	cum	1929.00
12.7	<b>Stone masonry work in cement mortar 1:3 in foundation complete as drawing and Technical Specification</b>		
(a)	<b>Square Rubble Coursed rubble masonry( first sort )</b>	cum	3083.00

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
(b)	Random Rubble Masonry	cum	2982.00
12.8	Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications		
A	PCC Grade M15	cum	3848.00
B	PCC Grade M20	cum	4095.00
C	RCC Grade M20		
Case I	Using concrete mixer	cum	4189.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4075.00
D	PCC Grade M25		
Case I	Using concrete Mixer	cum	4479.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4369.00
E	RCC Grade M25		
Case I	Using concrete Mixer	cum	4578.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4464.00
F	PCC Grade M30		
Case I	Using Concrete Mixer	cum	4511.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4397.00
G	RCC Grade M30		
Case I	Using Concrete Mixer	cum	4591.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4478.00
H	RCC Grade M35		
Case I	Using Concrete Mixer	cum	4677.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4565.00
12.9	Providing and constructing temporary island 16 m diameter for construction of well foundation for 8m dia. Well.		
A	Assuming depth of water 1.0 m and height of island to be 1.25m including Royalty for earth @ ₹5526.40 for each Island.	each	55654.00
B	Assuming depth of water 4.0 m and height of island 4.5 m including Royalty for earth @ ₹19895.04 for each Island.	each	300229.00
C	Providing and constructing one span service road to reach island location from one pier location to another pier location including Royalty for earth @ ₹330.00 per m for service Road.	metre	3555.00
12.10	Providing and laying cutting edge of mild steel weighing 40 kg per metre for well foundation complete as per drawing and technical specification.	tonne	84901.00
12.11	Plain/Reinforced cement concrete, in well foundation complete as per drawing and technical specification		
A			
(i)	RCC M20 Grade		
Case I	Using concrete mixer	cum	4835.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4702.00
(ii)	RCC M25 Grade		
Case I	Using concrete mixer	cum	5295.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5164.00
(iii)	RCC M35 Grade		
Case I	Using concrete mixer	cum	5450.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	#REF!
B	Well steining		
(I)	PCC M15 Grade	cum	4070.00
(ii)	PCC M20 Grade	cum	4331.00
(iii)	RCC M20 Grade		
Case I	Using concrete mixer	cum	4432.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4310.00
(iv)	PCC M25 Grade		
Case I	Using concrete mixer	cum	4750.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4632.00

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### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
(v)	RCC M25 Grade		
Case I	Using concrete mixer	cum	4853.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4733.00
(vi)	PCC M30 Grade		
Case I	Using concrete mixer	cum	4795.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4672.00
(vii)	RCC M30 Grade		
Case I	Using concrete mixer	cum	4878.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4760.00
(viii)	RCC M35 Grade		
Case I	Using concrete mixer	cum	4996.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	#REF!
(ix)	RCC M40 Grade		
C	Bottom Plug		
(i)	PCC Grade M20		
Case I	Using Concrete Mixer	cum	4880.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4533.00
(ii)	PCC Grade M25		
Case I	Using Concrete Mixer	cum	5137.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4788.00
(iii)	PCC Grade M30		
Case I	Using Concrete Mixer	cum	5181.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4834.00
(iv)	PCC Grade M35		
Case I	Using Concrete Mixer	cum	5282.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4932.00
D	Intermediate plug		
(I)	Grade M20 PCC		
Case I	Using Concrete Mixer	cum	4677.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4350.00
(ii)	Grade M25 PCC		
Case I	Using Concrete Mixer	cum	4923.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4593.00
(iii)	Grade M30 PCC		
Case I	Using Concrete Mixer	cum	4963.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4636.00
E	Top plug		
(i)	Grade M15 PCC		
Case I	Using Concrete Mixer	cum	3700.00
(ii)	Grade M20 PCC		
Case I	Using Concrete Mixer	cum	3937.00
(iii)	Grade M25 PCC		
Case I	Using Concrete Mixer	cum	4318.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4211.00
(iv)	Grade M30 PCC		
Case I	Using Concrete Mixer	cum	4359.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4247.00
F	Well cap		
(i)	RCC Grade M20		
Case I	Using concrete Mixer	cum	4147.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4031.00

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
(ii)	RCC Grade M25		
Case I	Using concrete Mixer	cum	4578.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4466.00
(iii)	RCC Grade M30		
Case I	Using Concrete Mixer	cum	4591.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4478.00
(iv)	RCC Grade M35		
Case I	Using Concrete Mixer	cum	4677.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4565.00
(v)	RCC M40 Grade	cum	5048.00
12.12	Sinking of 6 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth below bed level upto 3.0 M	metre	6826.00
(ii)	Beyond 3m upto 10m depth	metre	9942.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	13129.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	24624.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	29549.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	58504.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	70205.00
B	Clayey soil ( 6m dia. Well )		
(i)	Depth below bed level upto 3.0 M	metre	9961.00
(ii)	Beyond 3m upto 10m depth	metre	22657.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	29923.00
b	Add for dewatering @ 5% of cost, if required.	metre	31419.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	56129.00
b	Add 5% of cost for dewatering of the cost, if required	metre	73669.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	70161.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	133355.00
b	Add 5% of cost for dewatering, if required	metre	168027.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	160026.00
C	Soft rock (6m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	26322.00
D	Hard rock (6m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	32564.00
12.13	Sinking of 7 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		

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### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
(i)	Depth below bed level upto 3.0 M	metre	10647.00
(ii)	Beyond 3m upto 10m depth	metre	14467.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	19106.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	35837.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour ) .	metre	43005.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	85144.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	102173.00
B	Clayey soil ( 7m dia. Well )		
(I)	Depth below bed level upto 3.0 M	metre	14467.00
(ii)	Beyond 3m upto 10m depth	metre	23741.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	31354.00
b	Add for dewatering @ 5% of cost, if required.	metre	32922.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	58812.00
b	Add 5% of cost for dewatering on the cost, if required	metre	77192.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	73516.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	139729.00
b	Add 5% of cost for dewatering, if required	metre	176059.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).		167675.00
C	Soft rock ( 7m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	24788.00
D	Hard rock ( 7m dia well )		
(i)	Depth upto 3 m	metre	38342.00
12.14	Sinking of 8 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth below bed level upto 3.0 M	metre	13058.00
(ii)	Beyond 3m upto 10m depth	metre	16188.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	21379.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	40102.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	48123.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	95278.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	114333.00
B	Clayey soil ( 8m dia. Well )		

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Item No.	Description	Unit	Rate (₹)
(i)	Depth upto 3.0 M	metre	17694.00
(ii)	Beyond 3m upto 10m depth	metre	24499.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	32356.00
b	Add for dewatering @ 5% of cost, if required.	metre	33974.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	60692.00
b	Add 5% of cost for dewatering on the cost, if required	metre	79658.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	75865.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	144195.00
b	Add 5% of cost for dewatering, if required	metre	181685.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	173033.00
C	Soft rock ( 8m dia well )		
(i)	Depth in soft rock strata upto 3m	metre	27264.00
D	Hard rock ( 8m dia well )		
(i)	Depth in hard rock strata upto 3 m	metre	38735.00
12.15	Sinking of 9 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth below bed level upto 3.0 M	metre	13151.00
(ii)	Beyond 3m upto 10m depth	metre	17783.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	23486.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	44054.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	52864.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	104664.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	125597.00
B	Clayey soil ( 9m dia. Well )		
(i)	Depth below bed level upto 3.0 M	metre	18604.00
(ii)	Beyond 3m upto 10m depth	metre	26436.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	34914.00
b	Add for dewatering @ 5% of cost, if required.	metre	36659.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	65489.00
b	Add 5% of cost for dewatering on the cost, if required	metre	85955.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	81862.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	155593.00

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Item No.	Description	Unit	Rate (₹)
b	Add 5% of cost for dewatering, if required	metre	196047.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	186711.00
C	Soft rock ( 9m dia well )		
(i)	Depth upto 3m	metre	34512.00
D	Hard rock ( 9m dia well )		
(i)	Depth of hard rock strata upto 3 m	metre	45602.00
12.16	Sinking of 10 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth below bed level upto 3.0 m	metre	16062.00
(ii)	Beyond 3m upto 10m depth	metre	18699.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	24695.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	46322.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	55586.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	110056.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	132068.00
B	Clayey soil (10m dia. Well )		
(i)	Depth below bed level upto 3.0 m	metre	20044.00
ii)	Beyond 3m upto 10m depth	metre	25785.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	34053.00
b	Add for dewatering @ 5% of cost, if required.	metre	35756.00
(iv)	Beyond 20 m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	63873.00
b	Add 5% of cost for dewatering on the cost, if required	metre	83834.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	79842.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	151753.00
b	Add 5% of cost for dewatering, if required	metre	191209.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).		182104.00
C	Soft rock (10m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	35250.00
D	Hard rock (10m dia well )		
(i)	Depth of hard rock strata upto 3 m	metre	53738.00
12.17	Sinking of 11 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth from bed level upto 3.0 m	metre	37625.00
(ii)	Beyond 3m upto 10m depth	metre	27720.00
(iii)	Beyond 10m upto 20m		



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Item No.	Description	Unit	Rate (₹)
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	36608.00
(iv)	Beyond 20 m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	68665.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour	metre	82398.00
(v)	Beyond 30 m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	163137.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	195765.00
B	Clayey soil (11 m dia. Well )		
(i)	Depth from bed level upto 3.0 m	metre	33389.00
(ii)	Beyond 3 m upto 10 m depth	metre	52886.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	69845.00
b	Add for dewatering @ 5% of cost, if required.	metre	73338.00
(iv)	Beyond 20 m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	131011.00
b	Add 5% of cost for dewatering on the cost, if required	metre	171952.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	163764.00
(v)	Beyond 30 m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	311262.00
b	Add 5% of cost for dewatering, if required	metre	392191.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	373515.00
C	Soft rock (11m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	78943.00
D	Hard rock (11m dia well )		
(i)	Depth of hard rock upto 3 m	metre	121201.00
12.18	Sinking of 12 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	I) Depth below bed level upto 3.0m	metre	76695.00
(ii)	Beyond 3m upto 10m depth	metre	84917.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	112148.00
(iv)	Beyond 20m upto 30m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	210360.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	252432.00
(v)	Beyond 30m upto 40m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	499785.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	599742.00
B	Clayey soil (12 m dia. Well )		
(i)	Depth below bed level upto 3.0 m	metre	82506.00
(ii)	Beyond 3m upto 10m depth	metre	134268.00
(iii)	Beyond 10 m upto 20 m		

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Item No.	Description	Unit	Rate (₹)
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	177325.00
b	Add for dewatering @ 5% of cost, if required.	metre	186191.00
(iv)	Beyond 20 m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	332615.00
b	Add 5% of cost for dewatering on the cost, if required	metre	436558.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	415769.00
(v)	Beyond 30 m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	790248.00
b	Add 5% of cost for dewatering, if required	metre	995712.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	948297.00
C	Soft rock (12m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	186931.00
D	Hard rock (12m dia well )		
(i)	Depth of hard rock strata upto 3 m	metre	282939.00
12.19	Sinking of Twin D Type well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.		
A	Sandy soil		
(i)	Depth from bed level upto 3.0m	metre	17452.00
(ii)	Beyond 3m upto 10m depth	metre	18756.00
(iii)	Beyond 10m upto 20m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	24772.00
(iv)	Beyond 20m upto 30m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	46467.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	55761.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	110400.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	132481.00
B	Clayey soil (Twin D Type Well )		
(i)	Depth below bed level upto 3.0m	metre	20217.00
(ii)	Beyond 3m upto 10m depth	metre	28661.00
(iii)	Beyond 10 m upto 20 m		
a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	37852.00
b	Add for dewatering @ 5% of cost, if required.	metre	39745.00
(iv)	Beyond 20m upto 30 m		
a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	70999.00
b	Add 5% of cost for dewatering on the cost, if required	metre	93187.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	88749.00
(v)	Beyond 30m upto 40 m		
a	Add 10% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	168685.00
b	Add 5% of cost for dewatering, if required	metre	212544.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	202422.00
C	Soft rock (Twin D Type well )		

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
(i)	Depth of soft rock strata upto 3m	metre	41607.00
D	Hard rock (Twin D Type well )		
(i)	Depth of hard rock strata upto 3 m	metre	57097.00
12.20	Pneumatic sinking of wells with equipment of approved design, drawing and specifications worked by competent and trained personnel and comprising of compression and decompression chambers, reducers, two air locks separately for men and plant & materials, arrangement for supply of fresh air to working chambers, check valves, exhaust valves, shafts made from steel plates of riveted construction not less than 6 mm thick to withstand an air pressure of 0.50 MPa, controlled blasting of hard rock where required, staircases and 1 m wide landing plate forms with railing, arrangement for compression and decompression, electric lighting of 50 V maximum, proper rooms for rest and medical examinations and compliance with safety precautions as per IS:4138, all as per clause 1207.6 of MoRTH Specifications.	cum	#VALUE!
12.21	Sand filling in wells complete as per drawing and technical specifications	cum	293.00
12.22	Providing steel liner 10 mm thick for curbs and 6mm thick for steining of wells including fabricating and setting out as per detailed drawing	tonne	77212.00
12.23	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-750 mm)		
	A) With using Concrete Mixer	metre	6972.00
	B) With using Batching Plant	metre	6818.00
12.24	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-1000 mm)		
	A) With using Concrete Mixer	metre	11182.00
	B) With using Batching Plant	metre	10907.00
12.25	Bored cast-in-situ M35 grade R.C.C. pile excluding reinforcement complete as per drawing and technical specifications and removal of excavated earth with all lifts and lead upto 1000 m. (Pile diameter-1200 mm)		
	A) With using Concrete Mixer	metre	13860.00
	B) With using Batching Plant	metre	13464.00
12.26	Driven cast-in-place vertical M35 grade R.C.C. pile excluding reinforcement complete as per drawing and & Technical Specification (Pile diameter - 750 mm)		
	A) With using Concrete Mixer	metre	4466.00
	B) With using Batching Plant	metre	4311.00
12.27	Driven cast-in-place vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile diameter - 1000 mm)		
	A) With using Concrete Mixer	metre	7016.00
	B) With using Batching Plant	metre	6741.00
12.28	Driven cast-in-place vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile diameter - 1200 mm)		
	A) With using Concrete Mixer	metre	10266.00
	B) With using Batching Plant	metre	9870.00
12.29	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile Diameter=500 mm)	metre	#VALUE!
12.30	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile Diameter=750 mm)	metre	#VALUE!
12.31	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Pile Diameter=1000 mm)	metre	#VALUE!
12.32	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Size of pile - 300 mm x 300 mm)	metre	#VALUE!
12.33	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Size of pile - 500 mm x 500 mm)	metre	#VALUE!
12.34	Driven precast vertical M35 grade R.C.C. piles excluding reinforcement complete as per drawing and & Technical Specification (Size of pile - 750 mm x 750 mm)	metre	#VALUE!
12.35	Driven vertical steel piles complete as per drawing and & Technical Specification (Section of the pile - H Section steel column 400 x 250 mm (ISHB Series) )	metre	#VALUE!
12.36	Driven vertical steel piles complete as per drawing and & Technical Specification (Section of the pile - H Section steel column 450 x 250 mm (ISHB Series) )	metre	#VALUE!
12.37	Pile load test on single vertical pile in accordance with IS:2911(Part-IV)	tonne	VALUE

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Item No.	Description	Unit	Rate (₹)
12.38	Cement concrete for reinforced concrete in pile cap complete as per drawing and Technical Specification		
A	RCC Grade M20		
(i)	Using Concrete Mixer	cum	4166.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4080.00
B	RCC Grade M25		
(i)	Using concrete mixer.	cum	4580.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4543.00
C	RCC Grade M30		
(i)	Using concrete mixer.	cum	4632.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4546.00
D	RCC Grade M35		
(i)	Using concrete mixer.	cum	4742.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4705.00
12.39	Levelling course for Pile cap	cum	3428.00
12.40	Supplying, fitting and placing un-coated HYSD bar reinforcement in foundation complete as per drawing and technical specifications	tonne	63053.00
12.41	Supplying, fitting and placing un-coated Mild steel reinforcement complete in foundation as per drawing and technical specification	tonne	68061.00

  
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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
12.1	304		<b>Excavation for Structures</b>					
			Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material.					
		I	<b>Ordinary soil</b>					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
		A	<b>Manual Means</b>					
		(i)	<b>Depth upto 3 m</b>					
		a)	<b>Labour</b>					
			Mate	day	0.14	272.00	38.08	L-12
			Mazdoor	day	3.50	257.00	899.50	L-13
		b)	<b>Overhead charges @ 0.21 on (a)</b>				196.89	
		c)	<b>Contractor's profit @ 0.1 on (a+b)</b>				113.45	
			Cost for 10 cum = a+b+c				1247.92	
			<b>Rate per cum = (a+b+c)/10</b>				124.79	
						<b>say</b>	<b>125.00</b>	
		Note	1. Cost of dewatering may be added where required upto, 10 percent of labour cost assessment for dewatering shall be made as per site conditions.					
			2. The excavated earth can be used partially for backfilling of foundation pit and partly for road work except for marshy soil. Hence cost of disposal has not been added except for marshy soil. This remark is common to all cases of item 12.1 excluding marshy soil.					
			3. The cost of shoring and shuttering, where needed, may be added @ 1 per cent on cost of excavation for open foundation.					
12.1 (I) A		(ii)	<b>Depth 3 m to 6 m</b>					
		a)	<b>Labour</b>					
			Mate/Supervisor	day	0.18	272.00	48.96	L-12
			Mazdoor	day	4.50	257.00	1156.50	L-13
		b)	<b>Overhead charges @ 0.21 on (a)</b>				253.15	
		c)	<b>Contractor's profit @ 0.1 on (a+b)</b>				145.86	
			Cost for 10 cum = a+b+c				1604.47	
			<b>Rate per cum = (a+b+c)/10</b>				160.45	
						<b>say</b>	<b>160.00</b>	
		Note	Cost of dewatering may be added where required upto 15 per cent of labour cost. Assessment for dewatering shall be done as per actual ground conditions.					
12.1 (I) A		(iii)	<b>Depth above 6 m</b>					
		a)	<b>Labour</b>					
			Mate/Supervisor	day	0.24	272.00	65.28	L-12
			Mazdoor	day	6.00	257.00	1542.00	L-13
		b)	<b>Overhead charges @ 0.21 on (a)</b>				337.53	
		c)	<b>Contractor's profit @ 0.1 on (a+b)</b>				194.48	
			Cost for 10 cum = a+b+c				2139.29	
			<b>Rate per cum = (a+b+c)/10</b>				213.93	
						<b>say</b>	<b>214.00</b>	
		Note	1. Cost of dewatering may be added where required upto 20 per cent of labour cost. Assessment for dewatering shall be made as per site conditions..					
12.1 (I)		B	<b>Mechanical Means</b>					
		(i)	<b>Depth upto 3 m</b>					
			<i>Unit = cum</i>					
			<i>Taking output = 240 cum</i>					
		a)	<b>Labour</b>					
			Mate	day	0.32	272.00	87.04	L-12
			Mazdoor	day	8.00	257.00	2056.00	L-13

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>b) Machinery</b>					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1958.00	11748.00	P&M-026
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				2917.12	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1680.82	
			Cost for 240 cum = a+b+c+d				18488.97	
			<b>Rate per cum = (a+b+c+d)/240</b>				77.04	
						<b>say</b>	<b>77.00</b>	
		<b>Note</b>	Cost of dewatering upto 5 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..					
12.1 (I)		(ii)	<b>Depth 3 m to 6 m</b>					
B			<b>Unit = cum</b>					
			<b>Taking output = 210 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.32	272.00	87.04	L-12
			Mazdoor	day	8.00	257.00	2056.00	L-13
			<b>b) Machinery</b>					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1958.00	11748.00	P&M-026
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				2917.12	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1680.82	
			Cost for 210 cum = a+b+c+d				18488.97	
			<b>Rate per cum = (a+b+c+d)/210</b>				88.04	
						<b>say</b>	<b>88.00</b>	
		<b>Note</b>	Cost of dewatering upto 7.5 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions..					
12.1 (I)		(iii)	<b>Depth above 6m</b>					
B			<b>Unit = cum</b>					
			<b>Taking output = 180 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.40	272.00	108.80	L-12
			Mazdoor	day	10.00	257.00	2570.00	L-13
			<b>b) Machinery</b>					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1958.00	11748.00	P&M-026
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				3029.63	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1745.64	
			Cost for 180 cum = a+b+c+d				19202.07	
			<b>Rate per cum = (a+b+c+d)/180</b>				106.68	
						<b>say</b>	<b>107.00</b>	
		<b>Note</b>	1. Cost of dewatering upto 10 per cent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions.					
			2. Labour provided for excavation by mechanical means includes that required for trimming of bottom and side slopes.					
12.1		II	<b>Ordinary Rock (not requiring blasting)</b>					
		A	<b>Manual Means</b>					
		(i)	<b>Depth upto 3 m</b>					
			<b>Unit = cum</b>					
			<b>Taking output = 10 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.20	272.00	54.40	L-12
			Mazdoor	day	5.00	257.00	1285.00	L-13
			<b>b) Overhead charges @ 0.21 on (a)</b>				281.27	
			<b>c) Contractor's profit @ 0.1 on (a+b)</b>				162.07	
			Cost for 10 cum = a+b+c				1782.74	
			<b>Rate per cum = (a+b+c)/10</b>				178.27	

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
						<i>say</i>	<b>178.00</b>	
		<b>Note</b>	Cost of dewatering upto 10 per cent of labour cost may be added, where required. Assessment for dewatering shall be made as per site conditions.					
12.1(II)		<b>B</b>	<b>Mechanical Means</b>					
			<i>Unit = cum</i>					
			<i>Taking output = 180 cum</i>					
			<b>a) Labour</b>					
			Mate	day	0.24	272.00	65.28	L-12
			Mazdoor	day	6.00	257.00	1542.00	L-13
			<b>b) Machinery</b>					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1958.00	11748.00	P&M-026
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				2804.61	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1615.99	
			Cost for 180 cum = a+b+c+d				17775.88	
			<b>Rate per cum = (a+b+c+d)/180</b>				98.75	
						<i>say</i>	<b>99.00</b>	
		<b>Note</b>	1. Cost of dewatering upto 10 per cent of (a+b), may be added, where required. Assessment for dewatering shall be made as per site conditions.					
			2. In case of rock, foundation beyond 3 m is not dug and hence not included.					
12.1		<b>III</b>	<b>Hard Rock ( requiring blasting )</b>					
		<b>A</b>	<b>Manual Means</b>					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
			<b>a) Labour</b>					
			Mate	day	0.35	272.00	95.20	L-12
			Driller	day	0.50	307.00	153.50	L-06
			Blaster	day	0.25	425.00	106.25	L-03
			Mazdoor	day	8.00	257.00	2056.00	L-13
			<b>b) Machinery</b>					
			Air Compressor 250 cfm with 2 jack hammer for drilling.	hour	1.00	481.00	481.00	P&M-001
			<b>c) Material</b>					
			Blasting Material	kg	3.50	781.83	2736.41	M-104
			Detonator electric	each	14.00	5.73	80.20	M-094/100
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				1198.80	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				690.74	
			Cost for 10 cum = a+b+c+d+e				7598.09	
			<b>Rate per cum = (a+b+c+d+e)/10</b>				759.81	
						<i>say</i>	<b>760.00</b>	
		<b>Note</b>	Cost of dewatering @ 10 percent of (a+b) may be added, where required. Assessment for dewatering shall be made as per site conditions.					
12.1		<b>IV</b>	<b>Hard Rock ( blasting prohibited )</b>					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
		<b>A</b>	<b>Mechanical Means</b>					
			<b>a) Labour</b>					
			Mate	day	0.20	272.00	54.40	L-12
			Mazdoor	day	5.00	257.00	1285.00	L-13
			<b>b) Machinery</b>					
			Air Compressor 250 cfm with 2 leads of pneumatic breaker	hour	6.00	481.00	2886.00	P&M-001



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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			c) Overhead charges @ 0.21 on (a+b)				887.33	
			d) Contractor's profit @ 0.1 on (a+b+c)				511.27	
			Cost for 10 cum = a+b+c+d				5624.01	
			Rate per cum = (a+b+c+d)/10				562.40	
						say	<b>562.00</b>	
		Note	1. Cost of dewatering upto 10 per cent of (a+b), may be added, where required. Assessment for dewatering shall be made as per site conditions.					
			2. In case of rock, foundation beyond 3 m is not dug and hence not included.					
12.1		V	<b>Marshy Soil</b>					
			Unit = cum					
			Taking output = 10 cum					
			Depth upto 3 m					
		A	<b>Manual means</b>					
			a) Labour					
			Mate/Supervisor	day	0.40	272.00	108.80	L-12
			Mazdoor	day	10.00	257.00	2570.00	L-13
			b) Machinery					
			Tractor-trolley for removal.	hour	2.67	546.00	1457.82	P&M-053
			c) Overhead charges @ 0.21 on (a+b)				868.69	
			d) Contractor's profit @ 0.1 on (a+b+c)				500.53	
			Cost for 10 cum = a+b+c+d				5505.84	
			Rate per cum = (a+b+c+d)/10				550.58	
						say	<b>551.00</b>	
		Note	1. Cost of dewatering @ 30 per cent of (a), may be added, where required. Assessment for dewatering shall be made as per site conditions.					
			2. Shoring & strutting 15 per cent of (a), where required may be added					
			3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item 12.1-IA (ii) to (iii) for ordinary soil					
12.1 (V)		B	<b>Mechanical Means</b>					
			a) Labour					
			Mate	day	0.08	272.00	21.76	L-12
			Mazdoor for dressing sides, bottom and backfilling	day	2.00	257.00	514.00	L-13
			b) Machinery					
			Hydraulic excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.17	1958.00	332.86	P&M-026
			Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.45	1018.00	458.10	P&M-048
			c) Overhead charges @ 0.21 on (a+b)				278.61	
			d) Contractor's profit @ 0.1 on (a+b+c)				160.53	
			Cost for 10 cum = a+b+c+d				1765.86	
			Rate per cum = (a+b+c+d)/10				176.59	
						say	<b>177.00</b>	
		Note	1. Cost of dewatering @ 20 percent of (a+b) may be added, where required					
			2. Shoring & strutting @ 10 percent of (a+b), where required may be added					
			3. It is assumed that Marshy Soil will be available upto 3 m depth only. For deeper excavation below 3 m depth, refer analysis in item 12.1-IB (ii) to (iii) for ordinary soil					
		VI	<b>Back Filling in Marshy Foundation Pits</b>					
			Unit : Cum					

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	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Taking Output : 6 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.12	272.00	32.64	L-12
		Mazdoor for dressing sides, bottom and backfilling	day	3.00	257.00	771.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley for transportation	hour	2.00	546.00	1092.00	P&M-053
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				398.08	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				229.37	
		Cost for 6 cum = a+b+c+d				2523.10	
		<b>Rate per cum = (a+b+c+d)/6</b>				420.52	
					<b>say</b>	<b>421.00</b>	
12.2	304	<b>Filling Annular Space Around Footing in Rock</b>					
		<b>Unit = cum</b>					
		<b>Taking out put = 1 cum</b>					
		Lean cement concrete 1:3:6 nominal mix. Rate may be taken as per item 12.4.				VALUE	
12.3	304	<b>Sand Filling in Foundation Trenches as per Drawing &amp; Technical Specification</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.01	272.00	2.72	L-12
		Mazdoor	day	0.30	257.00	77.10	L-13
		<b>b) Material</b>					
		Sand (assuming 20 per cent voids)	cum	1.20	116.85	140.22	M-006
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				46.21	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				26.62	
		<b>Rate per cum = a+b+c+d</b>				292.87	
					<b>say</b>	<b>293.00</b>	
12.4	2100	<b>PCC 1:3:6 in Foundation</b>					
		Plain cement concrete 1:3:6 nominal mix in foundation with crushed stone aggregate 40 mm nominal size mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days.					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.64	272.00	174.08	L-12
		Mason	day	1.00	345.00	345.00	L-11
		Mazdoor	day	15.00	257.00	3855.00	L-13
		<b>b) Material</b>					
		40 mm Aggregate	cum	13.50	441.08	5954.58	M-055
		coarse Sand	cum	6.75	150.80	1017.90	M-005
		cement	tonne	3.45	5156.00	17788.20	M-081
		Cost of water	KL	18.00	253.69	4566.42	M-189
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
		Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
		Water tanker 6 KL capacity	hour	2.00	183.00	366.00	P&M-060
		<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				7962.15	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				4587.71	
		Cost for 15 cum = a+b+c+d+e				50464.84	
		<b>Rate per cum = (a+b+c+d+e)/15</b>				3364.32	
					<b>say</b>	<b>3364.00</b>	

Analysis of Rates  
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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Note	Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.					
12.5	1300		Brick Masonry Work in Cement Mortar 1:3 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.					
			Unit = cum					
			Taking output = 5 cum					
			a) Material					
			Bricks 1st class	each	2500.00	6.214	15535.00	M-079
			Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.20	3030.00	3636.00	Item 12.6 (A)
			b) Labour					
			Mate	day	0.48	272.00	130.56	L-12
			Mason	day	4.00	345.00	1380.00	L-11
			Mazdoor	day	8.00	257.00	2056.00	L-13
			c) Overhead charges @ 0.21 on (a+b)				4774.89	
			d) Contractor's profit @ 0.1 on (a+b+c)				2751.24	
			Cost for 5 cum = a+b+c+d				30263.69	
			Rate per cum (a+b+c+d)/5				6052.74	
			With Normal Bricks			say	6053.00	
		(i)	Rate for Brick Work in C. M. 1:2 in foundation				6314.00	Sub_Analysis
		(ii)	Rate for Brick Work in C. M. 1:3 in foundation				6053.00	
		(iii)	Rate for Brick Work in C. M. 1:4 in foundation				5875.00	Sub_Analysis
		(iv)	Rate for Brick Work in C. M. 1:6 in foundation				5701.00	Sub_Analysis
	0							
12.5			With FLY ASH Bricks					
		(i)	Rate for Brick Work in C. M. 1:2 in foundation				5511.00	Sub_Analysis
		(ii)	Rate for Brick Work in C. M. 1:3 in foundation				5250.00	Sub_Analysis
		(iii)	Rate for Brick Work in C. M. 1:4 in foundation				5072.00	Sub_Analysis
		(iv)	Rate for Brick Work in C. M. 1:6 in foundation				4898.00	Sub_Analysis
12.6	Sub-analysis	(A)	Cement Mortar 1:3 (1 cement : 3 sand)					
			Unit = 1 cum					
			Taking output = 1 cum					
			a) Materials					
			Cement	tonne	0.51	5156.00	2629.56	M-081
			Sand	cum	1.05	150.80	158.34	M-005
			b) Labour					
			Mate	day	0.04	272.00	10.88	L-12
			Mazdoor	day	0.90	257.00	231.30	L-13
			Total Material and Labour = (a+b)			say	3030.00	
	Sub-analysis (Addl.)	(B)	Cement Mortar 1:2 (1 cement : 2 sand)					
			Unit = 1 cum					
			Taking output = 1 cum					
			a) Materials					
			Cement	tonne	0.672	5156.00	3464.83	M-081
			Sand	cum	0.933	150.80	140.75	M-005
			b) Labour					
			Mate	day	0.04	272.00	10.88	L-12

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Mazdoor	day	0.90	257.00	231.30	L-13
			Total Material and Labour = (a+b)			<b>say</b>	<b>3848.00</b>	
	Sub- analysis (Addl.)	(C)	Cement Mortar 1:4 (1 cement : 4 sand)					
			Unit = 1 cum					
			Taking output = 1 cum					
			a) Materials					
			Cement	tonne	0.40	5156.00	2062.40	M-081
			Sand	cum	1.12	150.80	168.90	M-005
			b) Labour					
			Mate	day	0.04	272.00	10.88	L-12
			Mazdoor	day	0.90	257.00	231.30	L-13
			Total Material and Labour = (a+b)			<b>say</b>	<b>2473.00</b>	
	Sub- analysis (Addl.)	(D)	Cement Mortar 1:6 (1 cement : 6 sand)					
			Unit = 1 cum					
			Taking output = 1 cum					
			a) Materials					
			Cement	tonne	0.288	5156.00	1484.93	M-081
			Sand	cum	1.337	150.80	201.64	M-005
			b) Labour					
			Mate	day	0.04	272.00	10.88	L-12
			Mazdoor	day	0.90	257.00	231.30	L-13
			Total Material and Labour = (a+b)			<b>say</b>	<b>1929.00</b>	
12.7	1400		Stone Masonry Work in Cement Mortar 1:3 in Foundation complete as per Drawing and Technical Specifications.					
			Unit = cum					
			Taking output = 5 cum					
	1405.4	(A)	Square Rubble Coursed Rubble Masonry (first sort)					
			a) Material					
			Stone	cum	5.50	288.84	1588.62	M-169
			Through and bond stone	each	35.00	10.48	366.80	M-182
			(35nos.x0.24mx0.24mx0.39m = 0.79 cu.m)					
			Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.50	3030.00	4545.00	Item 12.6 (A)
			b) Labour					
			Mate	day	0.66	272.00	179.52	L-12
			Mason	day	7.50	345.00	2587.50	L-11
			Mazdoor	day	9.00	257.00	2313.00	L-13
			c) Overhead charges @ 0.21 on (a+b)				2431.89	
			d) Contractor's profit @ 0.1 on (a+b+c)				1401.23	
			Cost for 5 cum = a+b+c+d				15413.57	
			Rate per cum (a+b+c+d)/5				3082.71	
						<b>say</b>	<b>3083.00</b>	
	1405.3	(B)	Random Rubble Masonry					
			( coursed/uncoursed )					
			Unit = cum					
			Taking output = 5 cum					
			a) Material					
			Stone	cum	5.50	288.85	1588.68	M-148
			Through and bond stone	each	35.00	10.48	366.80	M-182
			(35nos.x0.24mx0.24mx0.39m = 0.79 cu.m)					

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.55	3030.00	4696.50	Item 12.6 (A)
			<b>b) Labour</b>					
			Mate	day	0.62	272.00	168.64	L-12
			Mason	day	6.00	345.00	2070.00	L-11
			Mazdoor	day	9.00	257.00	2313.00	L-13
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				2352.76	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1355.64	
			Cost for 5 cum = a+b+c+d				14912.01	
			<b>Rate per cum (a+b+c+d)/5</b>				2982.40	
						<b>say</b>	<b>2982.00</b>	
		<b>Note</b>	The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.					
12.8	1500, 1700 & 2100		<b>Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.</b>					
		<b>A</b>	<b>PCC Grade M15</b>					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	4.13	5156.00	21294.28	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			40 mm Aggregate	cum	8.10	441.08	3572.75	M-055
			20 mm Aggregate	cum	4.05	550.85	2230.94	M-053
			10 mm Aggregate	cum	1.35	614.17	829.13	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 63 KVA	hour	6.00	1062.00	6372.00	P&M-019
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>2780.00</b>			
			<b>d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				1668.09	
			<b>e) Overhead charges @ 0.21 on (a+b+c+d)</b>				9107.76	
			<b>f) Contractor's profit @ 0.1 on (a+b+c+d+e)</b>				5247.81	
			Cost for 15 cum = a+b+c+d+e+f				57725.88	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				3848.39	
						<b>say</b>	<b>3848.00</b>	
		<b>Note</b>	Needle Vibrator is an item of minor T & P which is already included in overhead charges. Hence not added in rate analysis of cement concrete works.					
12.8		<b>B</b>	<b>PCC Grade M20</b>					
			<b>Unit : cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	5.16	5156.00	26604.96	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			40 mm Aggregate	cum	5.40	441.08	2381.83	M-055
			20 mm Aggregate	cum	5.40	550.85	2974.59	M-053
			10 mm Aggregate	cum	2.70	614.17	1658.26	M-051
			<b>b) Labour</b>					

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>2958.00</b>			
			<b>d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				1775.07	
			<b>e) Overhead charges @ 0.21 on (a+b+c+d)</b>				9691.88	
			<b>f) Contractor's profit @ 0.1 on (a+b+c+d+e)</b>				5584.37	
			Cost for 15 cum = a+b+c+d+e+f				61428.09	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				4095.21	
						<b>say</b>	<b>4095.00</b>	
12.8		<b>C</b>	<b>RCC Grade M20</b>					
		<b>Case I</b>	<b>Using Concrete Mixer</b>					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	5.21	5156.00	26862.76	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3027.00</b>			
			<b>d) Formwork @ 4 per cent on (a+b+c)</b>				1815.93	
			<b>e) Overhead charges @ 0.21 on (a+b+c+d)</b>				9914.99	
			<b>f) Contractor's profit @ 0.1 on (a+b+c+d+e)</b>				5712.92	
			Cost for 15 cum = a+b+c+d+e+f				62842.12	
			<b>Rate per cum = (a+b+c+d+e+f)/15</b>				4189.47	
						<b>say</b>	<b>4189.00</b>	
12.8 C		<b>Case II</b>	<b>With Batching Plant, Transit Mixer and Concrete Pump</b>					
			<b>Unit : cum</b>					
			<b>Taking Output = 120 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	41.66	5156.00	214798.96	M-081
			Coarse Sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Loader 1 cum capacity	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Lead beyond 1 km, L-lead in km	tonne.km	300L	6.94	2082.00	P&M-050 Lead=1 km
			Concrete Pump	hour	6	385.00	2310.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>2944.00</b>			
			d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery				14132.11	
			e) Overhead charges @ 0.21 on (a+b+c+d)				77161.35	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				44459.63	
			Cost for 120 cum = a+b+c+d+e+f				489055.96	
			Rate per cum = ( a+b+c+d+e+f )/120				4075.47	
						say	<b>4075.00</b>	
12.8		D	PCC Grade M25					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	5.99	5156.00	30884.44	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			40 mm Aggregate	cum	5.40	441.08	2381.83	M-055
			20 mm Aggregate	cum	5.40	550.85	2974.59	M-053
			10 mm Aggregate	cum	2.70	614.17	1658.26	M-051
			b) Labour					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3244.00</b>			
			d) Formwork @ 3.75 per cent of (a+b+c)				1824.61	
			e) Overhead charges @ 0.21 on (a+b+c+d)				10600.98	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6108.18	
			Cost for 15 cum = a+b+c+d+e+f				67190.01	
			Rate per cum = ( a+b+c+d+e+f )/15				4479.33	
						say	<b>4479.00</b>	
12.8 D		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Unit : cum					
			Taking Output = 120 cum					
			a) Material					
			Cement	tonne	47.95	5156.00	247230.20	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			40 mm Aggregate	cum	43.20	441.08	19054.66	M-055
			20 mm Aggregate	cum	43.20	550.85	23796.72	M-053
			10 mm Aggregate	cum	21.60	614.17	13266.07	M-051
			b) Labour					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6	385.00	2310.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3164.00</b>			
			d) Formwork @ 3.75 per cent of cost of concrete i.e. cost of material, labour and machinery				14235.91	
			e) Overhead charges @ 0.21 on (a+b+c+d)				82710.65	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				47657.09	
			cost of 120 cum = a+b+c+d+e+f				524227.98	
			Rate per cum = (a+b+c+d+e+f)/120				4368.57	
						<b>say</b>	<b>4369.00</b>	
12.8		E	RCC Grade M25					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	6.05	5156.00	31193.80	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			b) Labour					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3315.00</b>			
			d) Formwork @ 3.75 per cent of a+b+c.				1864.85	
			e) Overhead charges @ 0.21 on (a+b+c+d)				10834.78	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6242.89	
			cost of 15 cum = a+b+c+d+e+f				68671.84	
			Rate per cum (a+b+c+d+e+f)/15				4578.12	
						<b>say</b>	<b>4578.00</b>	
12.8 E		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Unit: cum					
			Taking Output = 120 cum					
			a) Material					
			Cement	tonne	48.38	5156.00	249447.28	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			b) Labour					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080



# Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Loader 1 cum capacity 1 cum	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3233.00</b>			
			d) Formwork @ 3.75 per cent on cost of concrete i.e. cost of material, labour and machinery				14548.17	
			e) Overhead charges @ 0.21 on (a+b+c+d)				84524.86	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				48702.42	
			cost of 120 cum = a+b+c+d+e+f				535726.64	
			Rate per cum (a+b+c+d+e+f)/120				4464.39	
						<b>say</b>	<b>4464.00</b>	
12.8	F		PCC Grade M30					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	6.08	5156.00	31348.48	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			40 mm Aggregate	cum	5.40	441.08	2381.83	M-055
			20 mm Aggregate	cum	5.40	550.85	2974.59	M-053
			10 mm Aggregate	cum	2.70	614.17	1658.26	M-051
			b) Labour					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3275.00</b>			
			d) Formwork @ 3.50 per cent of cost of concrete i.e. cost of material, labour and machinery				1719.21	
			e) Overhead charges @ 0.21 on (a+b+c+d)				10676.29	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6151.58	
			cost of 15 cum = a+b+c+d+e+f				67667.36	
			Rate per cum (a+b+c+d+e+f)/15				4511.16	
						<b>say</b>	<b>4511.00</b>	
12.8 F		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit : cum					
			Taking Output = 120 cum					
			a) Material					
			Cement	tonne	48.60	5156.00	250581.60	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			40 mm Aggregate	cum	43.20	441.08	19054.66	M-055
			20 mm Aggregate	cum	43.20	550.85	23796.72	M-053
			10 mm Aggregate	cum	21.60	614.17	13266.07	M-051
			b) Labour					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002

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## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3191.00</b>			
			d) Formwork @ 3.50 per cent of cost of concrete i.e. cost of material, labour and machinery				13404.15	
			e) Overhead charges @ 0.21 on (a+b+c+d)				83239.77	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				47961.97	
			cost of 120 cum = a+b+c+d+e+f				527581.62	
			Rate per cum (a+b+c+d+e+f)/120				4396.51	
						<b>say</b>	<b>4397.00</b>	
12.8		G	RCC Grade M30					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	6.10	5156.00	31451.60	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			b) Labour					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3332.00</b>			
			d) Formwork @ 3.5 per cent on cost of concrete i.e. cost of material, labour and machinery				1749.55	
			e) Overhead charges @ 0.21 on (a+b+c+d)				10864.70	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6260.14	
			cost of 15 cum = a+b+c+d+e+f				68861.51	
			Rate per cum = (a+b+c+d+e+f)/15				4590.77	
						<b>say</b>	<b>4591.00</b>	
12.8 G		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	48.80	5156.00	251612.80	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			b) Labour					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080

## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Loader 1 cum capacity	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3251.00</b>			
			d) Formwork @ 3.5 per cent of cost of concrete i.e. cost of material, labour and machinery				13654.08	
			e) Overhead charges @ 0.21 on (a+b+c+d)				84791.87	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				48856.27	
			cost of 120 cum = a+b+c+d+e+f				537418.92	
			Rate per cum (a+b+c+d+e+f)/120				4478.49	
						say	<b>4478.00</b>	
12.8		H	RCC Grade M35					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	6.33	5156.00	32637.48	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			b) Labour					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3412.00</b>			
			d) Formwork @ 3 per cent on a+b+c				1535.19	
			e) Overhead charges @ 0.21 on (a+b+c+d)				11068.72	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6377.69	
			cost of 15 cum = a+b+c+d+e+f				70154.61	
			Rate per cum = (a+b+c+d+e+f)/15				4676.97	
						say	<b>4677.00</b>	
12.8 H		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit ; cum					
			Taking Output = 120 cum					
			a) Material					
			Cement	tonne	50.64	5156.00	261099.84	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			b) Labour					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1373.00	8238.00	P&M-017

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# Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3330.00</b>			
			d) Formwork @ 3 per cent on cost of concrete i.e. cost of material, labour and machinery				11988.11	
			e) Overhead charges @ 0.21 on (a+b+c+d)				86434.29	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				49802.61	
			cost of 120 cum = a+b+c+d+e+f				547828.76	
			Rate per cum = (a+b+c+d+e+f)/120				4565.24	
						say	<b>4565.00</b>	
		Note:	Where ever concrete is carried out using batching plant, transit mixer, concrete pump, Admixtures @ 0.4 per cent of weight of cement may be added for achieving desired slump of concrete.					
			<b>WELL FOUNDATION</b>					
12.9	1200		Providing and Constructing Temporary Island 16 m diameter for Construction of Well Foundation for 8m dia. Well.					
		A	Assuming depth of water 1.0 m and height of island to be 1.25 m including Royalty for earth @ ₹5526.40 for each Island.					
			Unit = 1 No					
			Taking output = 1 No.					
			a) Material					
			Earth (compacted)	cum	251.20	23.78	5973.54	M-092
			Sand bags	each	750.00	7.46	5595.00	M-159
			b) Labour					
			Mate	day	0.40	272.00	108.80	L-12
			Mazdoor for filling sand bags, stitching and placing	day	15.00	257.00	3855.00	L-13
			c) Machinery					
			Crane with grab 1 cum capacity	hour	20.00	1282.00	25640.00	P&M-012
			Consumables @ 2.5 per cent of (c) above				641.00	
			d) Overhead charges @ 0.21 on (a+b+c)				8780.80	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				5059.41	
			Rate per No. (a+b+c+d+e)				55653.55	
						say	<b>55654.00</b>	
		Note	It is assumed that earth will be available within the working space of crane with grab bucket.					
12.9		B	Assuming depth of water 4.0 m and height of island 4.5 m including Royalty for earth @ ₹19895.04 for each Island.					
			Unit = 1No					
			Taking output = 1 No					
			a) Material					
			Earth (compacted)	cum	904.32	23.78	21504.73	M-092
			Sand bags	each	6000.00	7.46	44760.00	M-159
			Wooden ballies 8" Dia and 9 m long	each	95.00	507.48	48210.60	M-194
			Wooden ballies 2" Dia for bracing	metre	190.00	20.98	3986.20	M-193
			b) Labour					
			Mate	day	5.60	272.00	1523.20	L-12
			Mazdoor for piling 8" dia ballies for piling 8" dia ballies	day	18.00	257.00	4626.00	L-13
			Mazdoor for bracing with 2" dia ballies	day	12.00	257.00	3084.00	L-13
			Mazdoor for filling sand bags, stitching and placing	day	110.00	257.00	28270.00	L-13
			c) Machinery					

# Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Crane with grab 1 cum capacity	hour	50.00	1282.00	64100.00	P&M-012
			Consumables and other arrangements for piling ballies @ 2.5 per cent of (a+b+c).				5501.62	
			d) Overhead charges @ 0.21 on (a+b+c)				47368.93	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				27293.53	
			Rate per No. (a+b+c+d+e)				300228.81	
						say	<b>300229.00</b>	
		Note	For other well diameters rate can be worked out on the basis of cross-sectional area of well. The diameter of the island shall be in the conformity with clause 1203.2 of MoRTH specifications.					
12.9	C		Providing and constructing one span service road to reach island location from one pier location to another pier location including Royalty for earth @ ₹330.00 per m for service Road.					
			Assuming span length 30 m, width of service road 10m and depth of water 1m					
			Unit = 1 meter					
			Taking output = 30 metre					
			a) Material					
			Earth	cum	450.00	23.78	10701.00	M-092
			Sand bags	each	300.00	7.46	2238.00	M-159
			b) Labour					
			Mate	day	0.24	272.00	65.28	L-12
			Mazdoor for filling sand bags, stitching and placing	day	6.00	257.00	1542.00	L-13
			c) Machinery					
			Front end Loader 1 cum capacity	hour	27.00	1373.00	37071.00	P&M-017
			Tipper 5.5 cum capacity	hour	28.00	1018.00	28504.00	P&M-048
			d) Overhead charges @ 0.21 on (a+b+c)				16825.47	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				9694.67	
			Cost for 30 m (a+b+c+d+e)				106641.42	
			Rate per m (a+b+c+d+e)/30				3554.71	
						say	<b>3555.00</b>	
12.10	1200 & 1900		Providing and Laying Cutting Edge of Mild Steel weighing 40 kg per metre for Well Foundation complete as per Drawing and Technical Specification.					
			Unit = 1 MT					
			Taking output = 1 MT					
			a) Material					
			Structural steel in plates, angles, etc including 5 per cent wastage	tonne	1.05	44927.00	47173.35	M-179
			Nuts & bolts	Kg	20.00	61.19	1223.80	M-130
			b) Labour					
			(for cutting, bending, making holes, joining, welding and erecting in position)					
			Mate	day	1.32	272.00	359.04	L-12
			Fitter	day	5.50	351.00	1930.50	L-08
			Blacksmith	day	5.50	345.00	1897.50	L-02a
			Welder	day	5.50	386.00	2123.00	L-02b
			Mazdoor	day	16.50	257.00	4240.50	L-13
			Electrodes, cutting gas and other consumables @ 10 per cent of cost of (a) above				4839.72	
			c) Overhead charges @ 0.21 on (a+b)				13395.36	
			d) Contractor's profit @ 0.1 on (a+b+c)				7718.28	
			Rate per MT (a+b+c+d)				84901.04	
						say	<b>84901.00</b>	

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Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
12.11	1200, 1500 & 1700		Plain/Reinforced Cement Concrete, in Well Foundation complete as per Drawing and Technical Specification.					
			Unit = 1 cum					
			Taking output = 1 cum					
		A	Well curb					
		(i)	RCC M20 Grade					
			Same as for 12.8 (C) except for formwork which shall be @ 20 per cent of the cost of concrete instead of 4 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3027.00	Item 12.8 (C)
			d) formwork @ 20 per cent of the cost of concrete				605.40	
			e) Overhead charges @ 0.21 on (a+b+c+d)				762.80	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				439.52	
			Rate perm (a+b+c+d+e+f)				4834.72	
						say	<b>4835.00</b>	
12.11 A		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
(i)			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				2944.00	Item 12.8 C II RCC
			d) formwork @ 20 per cent of the cost of concrete				588.80	
			e) Overhead charges @ 0.21 on (a+b+c+d)				741.89	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				427.47	
			Rate perm (a+b+c+d+e+f)				4702.16	
						say	<b>4702.00</b>	
12.11 A		(ii)	RCC M25 Grade					
			Same as for 12.8 (E) except for formwork which shall be @ 20 per cent of the cost of concrete instead of 3.75 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3315.00	Item 12.8 (E)
			d) formwork @ 20 per cent of the cost of concrete				663.00	
			e) Overhead charges @ 0.21 on (a+b+c+d)				835.38	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				481.34	
			Rate perm (a+b+c+d+e+f)				5294.72	
						say	<b>5295.00</b>	
12.11 A		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
(ii)			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3233.00	Item 12.8 (E) ii
			d) formwork @ 20 per cent of the cost of concrete				646.60	DIR used item
			e) Overhead charges @ 0.21 on (a+b+c+d)				814.72	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				469.43	
			Rate perm (a+b+c+d+e+f)				5163.75	
						say	<b>5164.00</b>	
12.11 A		(iii)	RCC M35 Grade					
			Same as for 12.8 (H) except for formwork which shall be @ 20 per cent of the cost of concrete instead of 3.0 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3412.00	Item 12.8 (H) Case I
			d) formwork @ 20 per cent of the cost of concrete				682.40	
			e) Overhead charges @ 0.21 on (a+b+c+d)				859.82	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				495.42	
			Rate perm (a+b+c+d+e+f)				5449.65	
						say	<b>5450.00</b>	

Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
12.11 A (iii)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				#REF!	#REF!
			d) formwork @ 20 per cent of the cost of concrete				#REF!	DIR used item
			e) Overhead charges @ 0.21 on (a+b+c+d)				#REF!	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				#REF!	
			Rate perm (a+b+c+d+e+f)				#REF!	
						say	#REF!	
		Note.	If curb concrete is carried out within steel liner, cost of formwork shall be excluded.					
12.11		B	Well steining					
		(I)	PCC M15 Grade					
			Same as for 12.8 (A) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				2780.00	Item 12.8 (A)
			d) formwork @ 10 per cent of the cost of concrete				278.00	
			e) Overhead charges @ 0.21 on (a+b+c+d)				642.18	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				370.02	
			Rate perm (a+b+c+d+e+f)				4070.20	
						say	<b>4070.00</b>	
12.11 B		(ii)	PCC M20 Grade					
			Same as for 12.8 (B) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				2958.00	Item 12.8 (B) PCC
			d) formwork @ 10 per cent of the cost of concrete				295.80	
			e) Overhead charges @ 0.21 on (a+b+c+d)				683.30	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				393.71	
			Rate perm (a+b+c+d+e+f)				4330.81	
						say	<b>4331.00</b>	
12.11 B		(iii)	RCC M20 Grade					
			Same as for 12.8 (C) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3027.00	Item 12.8 (C)
			d) formwork @ 10 per cent of the cost of concrete				302.70	
			e) Overhead charges @ 0.21 on (a+b+c+d)				699.24	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				402.89	
			Rate perm (a+b+c+d+e+f)				4431.83	
						say	<b>4432.00</b>	
12.11 B (iii)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				2944.00	Item 12.8 C II RCC
			d) formwork @ 10 per cent of the cost of concrete				294.40	
			e) Overhead charges @ 0.21 on (a+b+c+d)				680.06	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				391.85	
			Rate perm (a+b+c+d+e+f)				4310.31	
						say	<b>4310.00</b>	
12.11 B		(iv)	PCC M25 Grade					

Calc.  
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## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Same as for 12.8 (D) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 4 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3244.00	Item 12.8 (D) i
			d) formwork @ 10 per cent of the cost of concrete				324.40	
			e) Overhead charges @ 0.21 on (a+b+c+d)				749.36	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				431.78	
			Rate perm (a+b+c+d+e+f)				4749.54	
						say	<b>4750.00</b>	
12.11 B (iv)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3164.00	Item 12.8 (D)
			d) formwork @ 10 per cent of the cost of concrete				316.40	
			e) Overhead charges @ 0.21 on (a+b+c+d)				730.88	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				421.13	
			Rate perm (a+b+c+d+e+f)				4632.41	
						say	<b>4632.00</b>	
12.11 B		(v)	RCC M25 Grade					
			Same as for 12.8 (E) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3.5 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3315.00	Item 12.8 (E)
			d) formwork @ 10 per cent of the cost of concrete				331.50	
			e) Overhead charges @ 0.21 on (a+b+c+d)				765.77	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				441.23	
			Rate perm (a+b+c+d+e+f)				4853.49	
						say	<b>4853.00</b>	
12.11 B (v)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3233.00	Item 12.8 (E) ii
			d) formwork @ 10 per cent of the cost of concrete				323.30	DIR used item
			e) Overhead charges @ 0.21 on (a+b+c+d)				746.82	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				430.31	
			Rate perm (a+b+c+d+e+f)				4733.44	
						say	<b>4733.00</b>	
12.11 B		(vi)	PCC M30 Grade					
			Same as for 12.8 (F) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3.5 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3275.00	Item 12.8 (F)
			d) formwork @ 10 per cent of the cost of concrete				327.50	
			e) Overhead charges @ 0.21 on (a+b+c+d)				756.53	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				435.90	
			Rate perm (a+b+c+d+e+f)				4794.93	
						say	<b>4795.00</b>	
12.11 B (vi)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3191.00	Item 12.8 (F)ii
			d) formwork @ 10 per cent of the cost of concrete				319.10	
			e) Overhead charges @ 0.21 on (a+b+c+d)				737.12	



# Analysis of Rates

## FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				424.72	
			Rate perm (a+b+c+d+e+f)				4671.94	
						say	<b>4672.00</b>	
'12.11 B		(vii)	RCC M30 Grade					
			Same as for 12.8 (G) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3.5 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3332.00	Item 12.8 (G)
			d) formwork @ 10 per cent of the cost of concrete				333.20	
			e) Overhead charges @ 0.21 on (a+b+c+d)				769.69	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				443.49	
			Rate perm (a+b+c+d+e+f)				4878.38	
						say	<b>4878.00</b>	
12.11 B (vii)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3251.00	Item 12.8 (G) ii
			d) formwork @ 10 per cent of the cost of concrete				325.10	
			e) Overhead charges @ 0.21 on (a+b+c+d)				750.98	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				432.71	
			Rate perm (a+b+c+d+e+f)				4759.79	
						say	<b>4760.00</b>	
'12.11 B		(viii)	RCC M35 Grade					
			Same as for 12.8 (H) except for formwork which shall be @ 10 per cent of the cost of concrete instead of 3 per cent.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3412.00	Item 12.8 (H) Case I
			d) formwork @ 10 per cent of the cost of concrete				341.20	
			e) Overhead charges @ 0.21 on (a+b+c+d)				788.17	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				454.14	
			Rate perm (a+b+c+d+e+f)				4995.51	
						say	<b>4996.00</b>	
12.11 B (viii)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				#REF!	#REF!
			d) formwork @ 10 per cent of the cost of concrete				#REF!	DIR used item
			e) Overhead charges @ 0.21 on (a+b+c+d)				#REF!	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				#REF!	
			Rate perm (a+b+c+d+e+f)				#REF!	
						say	<b>#REF!</b>	
'12.11 B		(ix)	RCC M40 Grade					
			Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	51.60	5156.00	266049.60	M-081
			Coarse Sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			Admixture	kg	206.00	166.14	34224.84	M-180
			b) Labour					

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# Analysis of Rates

## FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			<b>c) Machinery</b>					
			Batching Plant	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Transit Mixer 4 cum capacity for lead beyond 1 km.	tonne.km	300xL	6.94	2082.00	Lead= 1, P&M-050
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3656.00</b>			
			<b>d) Formwork @ 10 per cent on cost of concrete i.e. cost of material, labour and machinery</b>				43877.83	
			<b>e) Overhead charges @ 0.21 on (a+b+c+d)</b>				101357.80	
			<b>f) Contractor's profit @ 0.1 on (a+b+c+d+e)</b>				58401.40	
			cost of 120 cum = a+b+c+d+e+f				642415.37	
			<b>Rate per cum = (a+b+c+d+e+f)/120</b>				5353.46	
						<b>say</b>	<b>5353.00</b>	
12.11 C		<b>C</b>	<b>Bottom Plug</b>					
			Concrete to be placed using tremie pipe					
			Note: 10% extra cement to be added where under water concreting is involved					
		(i)	<b>PCC Grade M20</b>					
		Case I	<b>Using Concrete Mixer</b>					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	5.55	5156.00	28615.80	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			40 mm Aggregate	cum	5.40	441.08	2381.83	M-055
			20 mm Aggregate	cum	5.40	550.85	2974.59	M-053
			10 mm Aggregate	cum	2.70	614.17	1658.26	M-051
			Admixture	Kg	18.60	166.14	3090.20	M-180
			<b>b) Labour</b>					
			Mate	day	0.90	272.00	244.80	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			Light Crane 3 tonnes capacity for handling tremie pipe	hour	6.00	537.00	3222.00	P&M-013
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3514.00</b>			
			Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.				2282.04	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				11548.47	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				6654.12	
			cost of 15 cum = a+b+c+d+e				73195.32	
			<b>Rate per cum = (a+b+c+d+e)/15</b>				4879.69	
						<b>say</b>	<b>4880.00</b>	
12.11 C (i)		Case II	<b>Using Batching Plant, Transit Mixer and Crane/concrete pump</b>					
			<b>Unit ; cum</b>					

Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>Taking Output = 120 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	44.40	5156.00	228926.40	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			Admixture	Kg	148.80	166.14	24721.63	M-180
			<b>b) Labour</b>					
			Mate	day	0.88	272.00	239.36	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3268.00</b>			
			Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.				16495.94	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				85818.34	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				49447.71	
			cost of 120 cum = a+b+c+d+e				543924.81	
			<b>Rate per cum = (a+b+c+d+e)/120</b>				4532.71	
						<b>say</b>	<b>4533.00</b>	
12.11 C		(ii)	<b>PCC Grade M25</b>					
		Case I	<b>Using Concrete Mixer</b>					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	5.99	5156.00	30884.44	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			40 mm Aggregate	cum	5.40	441.08	2381.83	M-055
			20 mm Aggregate	cum	5.40	550.85	2974.59	M-053
			10 mm Aggregate	cum	2.70	614.17	1658.26	M-051
			Admixture	Kg	21.60	166.14	3588.62	M-180
			<b>b) Labour</b>					
			Mate	day	0.90	272.00	244.80	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	537.00	3222.00	P&M-013
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3699.00</b>			
			Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.				2420.40	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				12158.61	

Calc.  
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Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				7005.68	
			cost of 15 cum = a+b+c+d+e				77062.43	
			<b>Rate per cum = (a+b+c+d+e)/15</b>				5137.50	
						<b>say</b>	<b>5137.00</b>	
12.11 C (ii)		Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
			<b>Unit = cum</b>					
			<b>Taking output = 120 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	47.88	5156.00	246869.28	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			Admixture	Kg	172.80	166.14	28708.99	M-180
			<b>b) Labour</b>					
			Mate	day	0.88	272.00	239.36	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3451.00</b>			
			Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.				17592.45	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				90653.96	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				52233.95	
			cost of 120 cum = a+b+c+d+e				574573.41	
			<b>Rate per cum = (a+b+c+d+e)/120</b>				4788.11	
						<b>say</b>	<b>4788.00</b>	
12.11 C		(iii)	PCC Grade M30					
		Case I	Using Concrete Mixer					
			<b>Unit = 1 cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	6.08	5156.00	31348.48	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			40 mm Aggregate	cum	5.40	441.08	2381.83	M-055
			20 mm Aggregate	cum	5.40	550.85	2974.59	M-053
			10 mm Aggregate	cum	2.70	614.17	1658.26	M-051
			Admixture	Kg	21.60	166.14	3588.62	M-180
			<b>b) Labour</b>					
			Mate	day	0.90	272.00	244.80	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079

# Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	537.00	3222.00	P&M-013
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3729.00</b>			
			Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.				2443.60	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				12260.93	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				7064.63	
			cost of 15 cum = a+b+c+d+e				77710.95	
			<b>Rate per cum = (a+b+c+d+e)/15</b>				5180.73	
						<b>say</b>	<b>5181.00</b>	
12.11 C (iii)		Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
			<b>Unit = cum</b>					
			<b>Taking output = 120 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	48.64	5156.00	250787.84	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			Admixture	Kg	172.80	166.14	28708.99	M-180
			<b>b) Labour</b>					
			Mate	day	0.88	272.00	239.36	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3483.00</b>			
			Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.				17788.38	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				91518.00	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				52731.80	
			cost of 120 cum = a+b+c+d+e				580049.80	
			<b>Rate per cum = (a+b+c+d+e)/120</b>				4833.75	
						<b>say</b>	<b>4834.00</b>	
12.11 C		(iv)	PCC Grade M35					
		Case I	Using Concrete Mixer					
			<b>Unit = 1 cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	6.29	5156.00	32431.24	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			40 mm Aggregate	cum	5.40	441.08	2381.83	M-055
			20 mm Aggregate	cum	5.40	550.85	2974.59	M-053
			10 mm Aggregate	cum	2.70	614.17	1658.26	M-051
			Admixture	Kg	21.60	166.14	3588.62	M-180
			<b>b) Labour</b>					

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Mate	day	0.90	272.00	244.80	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	537.00	3222.00	P&M-013
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3802.00</b>			
			Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.				2497.74	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				12499.68	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				7202.20	
			cost of 15 cum = a+b+c+d+e				79224.16	
			<b>Rate per cum = (a+b+c+d+e)/15</b>				5281.61	
						<b>say</b>	<b>5282.00</b>	
12.11 C (iv)		Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
			Unit = cum					
			Taking output = 120 cum					
			<b>a) Material</b>					
			Cement	tonne	50.28	5156.00	259243.68	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			Admixture	Kg	172.80	166.14	28708.99	M-180
			<b>b) Labour</b>					
			Mate	day	0.88	272.00	239.36	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3554.00</b>			
			Add 5 per cent of cost of material and labour towards cost of forming sump, protective bunds, chiselling and making arrangements for under water concreting with tremie pipe.				18211.17	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				93382.51	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				53806.11	
			cost of 120 cum = a+b+c+d+e				591867.25	
			<b>Rate per cum = (a+b+c+d+e)/120</b>				4932.23	
						<b>say</b>	<b>4932.00</b>	
12.11		D	Intermediate plug					
		(i)	Grade M20 PCC					
			Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3514.00	Item 12.11 (C) i

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			d) Overhead charges @ 0.21 on (a+b+c)				737.94	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				425.19	
			Rate per cum = (a+b+c+d+e)				4677.13	
						say	<b>4677.00</b>	
12.11 D (i)		Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3268.00	Item 12.11 (C) ii
			d) Overhead charges @ 0.21 on (a+b+c)				686.28	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				395.43	
			Rate per cum = (a+b+c+d+e)				4349.71	
						say	<b>4350.00</b>	
12.11 D		(ii)	Grade M25 PCC					
			Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3699.00	Item 12.11 (C) ii
			d) Overhead charges @ 0.21 on (a+b+c)				776.79	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				447.58	
			Rate per cum = (a+b+c+d+e)				4923.37	
						say	<b>4923.00</b>	
12.11 D (ii)		Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3451.00	Item 12.11 (C) ii
			d) Overhead charges @ 0.21 on (a+b+c)				724.71	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				417.57	
			Rate per cum = (a+b+c+d+e)				4593.28	
						say	<b>4593.00</b>	
12.11 D		(iii)	Grade M30 PCC					
			Same as in bottom plug concrete, excluding cost of forming sump, protective bunds, chiseling etc.					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3729.00	Item 12.11 (C) iii
			d) Overhead charges @ 0.21 on (a+b+c)				783.09	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				451.21	
			Rate per cum = (a+b+c+d+e)				4963.30	
						say	<b>4963.00</b>	
12.11 D (iii)		Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3483.00	Item 12.11 (C) iii
			d) Overhead charges @ 0.21 on (a+b+c)				731.43	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				421.44	
			Rate per cum = (a+b+c+d+e)				4635.87	
						say	<b>4636.00</b>	
12.11		E	Top plug					
		(i)	Grade M15 PCC					
			Same as Item 12.8(a) excluding formwork					
		Case I	Using Concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				2780.00	Item 12.8 (A)
			d) Overhead charges @ 0.21 on (a+b+c)				583.80	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				336.38	
			Rate per cum = (a+b+c+d+e)				3700.18	

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
						<b>say</b>	<b><u>3700.00</u></b>	
12.11 E		(ii)	<b>Grade M20 PCC</b>					
			Same as Item 12.8(b) excluding formwork					
		<b>Case I</b>	<b>Using Concrete Mixer</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				2958.00	Item 12.8 (B) PCC
			d) Overhead charges @ 0.21 on (a+b+c)				621.18	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				357.92	
			Rate per cum = (a+b+c+d+e)				3937.10	
						<b>say</b>	<b><u>3937.00</u></b>	
12.11 E		(iii)	<b>Grade M25 PCC</b>					
			Same as Item 12.8 (d) excluding formwork					
		<b>Case I</b>	<b>Using Concrete Mixer</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3244.00	Item 12.8 (D) i
			d) Overhead charges @ 0.21 on (a+b+c)				681.24	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				392.52	
			Rate per cum = (a+b+c+d+e)				4317.76	
						<b>say</b>	<b><u>4318.00</u></b>	
12.11 E (iii)		<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Crane/concrete pump</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3164.00	Item 12.8 (D)
			d) Overhead charges @ 0.21 on (a+b+c)				664.44	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				382.84	
			Rate per cum = (a+b+c+d+e)				4211.28	
						<b>say</b>	<b><u>4211.00</u></b>	
12.11 E		(iv)	<b>Grade M30 PCC</b>					
			Same as Item 12.8(f) excluding formwork					
		<b>Case I</b>	<b>Using Concrete Mixer</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3275.00	Item 12.8 (F)
			d) Overhead charges @ 0.21 on (a+b+c)				687.75	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				396.28	
			Rate per cum = (a+b+c+d+e)				4359.03	
						<b>say</b>	<b><u>4359.00</u></b>	
12.11 E (iv)		<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Crane/concrete pump</b>					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3191.00	Item 12.8 (F)ii
			d) Overhead charges @ 0.21 on (a+b+c)				670.11	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				386.11	
			Rate per cum = (a+b+c+d+e)				4247.22	
						<b>say</b>	<b><u>4247.00</u></b>	
12.11		<b>F</b>	<b>Well cap</b>					
		(i)	<b>RCC Grade M20</b>					
		<b>Case I</b>	<b>Using Concrete Mixer</b>					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
			<b>a) Material</b>					
			Cement	tonne	5.12	5156.00	26398.72	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	272.00	233.92	L-12



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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			Form Work @ 4 per cent of a+b+c				1797.37	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				9813.64	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				5654.53	
			cost of 15 cum = a+b+c+d+e				62199.78	
			<b>Rate per cum = (a+b+c+d+e)/15</b>				4146.65	
						<b>say</b>	<b>4147.00</b>	
12.11 F (i)		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	40.92	5156.00	210983.52	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader (capacity 1 cum)	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			Formwork @ 4 per cent of (a+b+c)				13979.50	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				76328.05	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				43979.50	
			cost of 120 cum = a+b+c+d+e				483774.47	
			<b>Rate per cum = (a+b+c+d+e)/120</b>				4031.45	
						<b>say</b>	<b>4031.00</b>	
12.11 F		(ii)	RCC Grade M25					
		Case I	Using Concrete Mixer					
			<i>Unit = cum</i>					
			<i>Taking output = 15 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	6.05	5156.00	31193.80	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			<b>b) Labour</b>					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			Form Work @ 3.75 per cent of a+b+c				1864.85	
			d) Overhead charges @ 0.21 on (a+b+c)				10834.78	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				6242.89	
			cost of 15 cum = a+b+c+d+e				68671.84	
			Rate per cum = (a+b+c+d+e)/15				4578.12	
						say	<b>4578.00</b>	
12.11 F (ii)		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	48.40	5156.00	249550.40	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			b) Labour					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader (capacity 1 cum)	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			Formwork @ 3.75 per cent of ( a+b+c)				14552.04	
			d) Overhead charges @ 0.21 on (a+b+c)				84547.33	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				48715.37	
			cost of 120 cum = a+b+c+d+e				535869.04	
			Rate per cum = (a+b+c+d+e)/120				4465.58	
						say	<b>4466.00</b>	
12.11 F		(iii)	RCC Grade M30					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	6.10	5156.00	31451.60	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			b) Labour					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			Formwork @ 3.5 per cent of (a+b+c)				1749.55	
			d) Overhead charges @ 0.21 on (a+b+c)				10864.70	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				6260.14	

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			cost of 15 cum = a+b+c+d+e				68861.51	
			Rate per cum = (a+b+c+d+e)/15				4590.77	
						<b>say</b>	<b>4591.00</b>	
12.11 F (iii)		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	48.79	5156.00	251561.24	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			b) Labour					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader (capacity 1 cum)	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			Formwork @ 3.5 per cent of (a+b+c)				13652.28	
			d) Overhead charges @ 0.21 on (a+b+c)				84780.66	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				48849.81	
			cost of 120 cum = a+b+c+d+e				537347.89	
			Rate per cum = (a+b+c+d+e)/120				4477.90	
						<b>say</b>	<b>4478.00</b>	
12.11 F		(iv)	RCC Grade M35					
		Case I	Using Concrete Mixer					
			Unit = cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	6.33	5156.00	32637.48	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			b) Labour					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			Formwork @ 3 per cent of (a+b+c)				1535.19	
			d) Overhead charges @ 0.21 on (a+b+c)				11068.72	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				6377.69	
			cost of 15 cum = a+b+c+d+e				70154.61	
			Rate per cum = (a+b+c+d+e)/15				4676.97	
						<b>say</b>	<b>4677.00</b>	

Calc.  
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Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
12.11 F (iv)		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	50.64	5156.00	261099.84	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			<b>b) Labour</b>					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			<b>c) Machinery</b>					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader (capacity 1 cum)	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			Formwork @ 3 per cent of (a+b+c)				11988.11	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				86434.29	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				49802.61	
			cost of 120 cum = a+b+c+d+e				547828.76	
			<b>Rate per cum = (a+b+c+d+e)/120</b>				4565.24	
						<b>say</b>	<b>4565.00</b>	
		<b>Note</b>	Where ever concrete is carried out using batching plant, transit mixer, concrete pump, Admixtures @ 0.4 per cent of weight of cement may be added for achieving desired slump of concrete.					
12.11 F		(v)	RCC M40 Grade					
			Using Batching Plant, Transit Mixer and Concrete Pump					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum</i>					
			<b>a) Material</b>					
			Cement	tonne	52.20	5156.00	269143.20	M-081
			Coarse Sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			Admixture	kg	206.00	166.14	34224.84	M-180
			<b>b) Labour</b>					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			<b>c) Machinery</b>					
			Batching Plant	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader 1 cum capacity	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1398.00	20970.00	P&M-049
			Transit Mixer 4 cum capacity for lead beyond 1 km.	tonne.km	300.L	6.94	2082.00	P&M-050 Lead= 1 km
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Formwork @ 3 per cent on cost of concrete i.e. cost of material, labour and machinery				13256.16	
			d) Overhead charges @ 0.21 on (a+b+c)				95576.90	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				55070.50	
			cost of 120 cum = a+b+c+d+e				605775.50	
			Rate per cum = (a+b+c+d+e)/120				5048.13	
						say	<b>5048.00</b>	
12.12	Section 1200		Sinking of 6 m external diameter well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			Unit = Running Meter.					
			Taking output = 1 m					
			Diameter of well - 6 m.					
		A	Sandy Soil					
		(i)	Depth below bed level upto 3.0 M					
			Rate of sinking = 0.50 m per hour.					
			a) Labour					
			Mate	day	0.12	272.00	32.64	L-12
			Sinker ( skilled )	day	1.00	325.00	325.00	L-15
			Sinking helper ( semi-skilled )	day	2.00	268.00	536.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	2.00	1925.00	3850.00	P&M-075
			Consumables in sinking @10 per cent of (b)				385.00	
			c) Overhead charges @ 0.21 on (a+b)				1077.01	
			d) Contractor's profit @ 0.1 on (a+b+c)				620.57	
			Rate per metre = (a+b+c+d)				6826.22	
						say	<b>6826.00</b>	
12.12 A		(ii)	Beyond 3m upto 10m depth					
			Rate of sinking = 0.33 m per hour.					
			a) Labour					
			Mate	day	0.15	272.00	40.80	L-12
			Sinker	day	1.25	325.00	406.25	L-15
			Sinking helper ( semi-skilled )	day	2.50	268.00	670.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.00	1925.00	5775.00	P&M-075
			Consumables in sinking @10 per cent of (b)				577.50	
			c) Overhead charges @ 0.21 on (a+b)				1568.61	
			d) Contractor's profit @ 0.1 on (a+b+c)				903.82	
			Rate per metre = (a+b+c+d)				9941.97	
						say	<b>9942.00</b>	
12.12 A		(iii)	Beyond 10m upto 20m					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
			11th m	5%	10439.00			
			12th m	5%	10961.00			
			13th m	5%	11509.00			
			14th m	5%	12084.00			
			15th m	5%	12688.00			
			16th m	5%	13322.00			
			17th m	5%	13988.00			
			18th m	5%	14687.00			

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Analysis of Rates  
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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			19th m	5%	15421.00			
			20th m	5%	16192.00			
			Total Cost from 10m upto 20m		131291.00			
			<b>Avg Rate per metre</b>		<b><u>13129.00</u></b>			
12.12 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		(a)	(b) Including 20% for Kentledge		
			21st m	7.5%	17406.00	20887.00		
			22nd m	7.5%	18711.00	22453.00		
			23rd m	7.5%	20114.00	24137.00		
			24th m	7.5%	21623.00	25948.00		
			25th m	7.5%	23245.00	27894.00		
			26th m	7.5%	24988.00	29986.00		
			27th m	7.5%	26862.00	32234.00		
			28th m	7.5%	28877.00	34652.00		
			29th m	7.5%	31043.00	37252.00		
			30th m	7.5%	33371.00	40045.00		
			Total Cost from 20m upto 30m		246240.00	295488.00		
			<b>Avg Rate per metre</b>		<b><u>24624.00</u></b>	<b><u>29549.00</u></b>		
12.12 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		(a)	(b) Including 20% for Kentledge		
			31st m	10%	36708.00	44050.00		
			32nd	10%	40379.00	48455.00		
			33rd m	10%	44417.00	53300.00		
			34th m	10%	48859.00	58631.00		
			35th m	10%	53745.00	64494.00		
			36th m	10%	59120.00	70944.00		
			37th m	10%	65032.00	78038.00		
			38th m	10%	71535.00	85842.00		
			39th m	10%	78689.00	94427.00		
			40th m	10%	86558.00	103870.00		
			Total Cost from 30m upto 40m		585042.00	702051.00		
			<b>Avg Rate per metre</b>		<b><u>58504.00</u></b>	<b><u>70205.00</u></b>		
12.12		B	<b>Clayey Soil ( 6m dia. Well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 meter</b>					
		(i)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking = 0.33 m per hour.					
		a)	<b>Labour</b>					
			Mate	day	0.15	272.00	40.80	L-12
			Sinker ( skilled )	day	1.50	325.00	487.50	L-15
			Sinking helper ( semi-skilled )	day	2.25	268.00	603.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.00	1925.00	5775.00	P&M-075
			Consumables in sinking @ 10 per cent of (b)				577.50	
		c)	<b>Overhead charges @ 0.21 on (a+b)</b>				1571.60	
		d)	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				905.54	
			<b>Rate per metre = (a+b+c+d)</b>				9960.94	

Analysis of Rates  
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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
						say	<u>9961.00</u>	
12.12 B		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking = 0.17 m per hour.					
		a)	<b>Labour</b>					
			Mate	day	0.30	272.00	81.60	L-12
			Sinker	day	3.00	325.00	975.00	L-15
			Sinking helper ( semi-skilled )	day	4.50	268.00	1206.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1925.00	11550.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	2.00	934.00	1868.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1341.80	
		c)	<b>Overhead charges @ 0.21 on (a+b)</b>				3574.70	
		d)	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				2059.71	
			<b>Rate per metre = (a+b+c+d)</b>				22656.81	
						say	<u>22657.00</u>	
12.12 B		(iii)	<b>Beyond 10 m upto 20 m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.			(a)	(b) Including for dewatering @ 5% of cost, if required	
			11th m	5%	23790.00	24980.00		
			12th m	5%	24980.00	26229.00		
			13th m	5%	26229.00	27540.00		
			14th m	5%	27540.00	28917.00		
			15th m	5%	28917.00	30363.00		
			16th m	5%	30363.00	31881.00		
			17th m	5%	31881.00	33475.00		
			18th m	5%	33475.00	35149.00		
			19th m	5%	35149.00	36906.00		
			20th m	5%	36906.00	38751.00		
			Total Cost from 10m upto 20m		299230.00	314191.00		
			<b>Avg Rate per metre</b>		<u>29923.00</u>	<u>31419.00</u>		
12.12 B		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering of the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).			(a)	(c) Including 25% for Kentledge	(b) Including 5% for dewatering, if required
			21st m	7.5%	39674.00	49593.00	52073.00	
			22nd m	7.5%	42650.00	53313.00	55979.00	
			23rd m	7.5%	45849.00	57311.00	60177.00	
			24th m	7.5%	49288.00	61610.00	64691.00	
			25th m	7.5%	52985.00	66231.00	69543.00	
			26th m	7.5%	56959.00	71199.00	74759.00	
			27th m	7.5%	61231.00	76539.00	80366.00	
			28th m	7.5%	65823.00	82279.00	86393.00	
			29th m	7.5%	70760.00	88450.00	92873.00	
			30th m	7.5%	76067.00	95084.00	99838.00	
			Total Cost from 20m upto 30m		561286.00	701609.00	736692.00	
			<b>Avg Rate per metre</b>		<u>56129.00</u>	<u>70161.00</u>	<u>73669.00</u>	
12.12 B		(v)	<b>Beyond 30m upto 40 m</b>					

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## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		(a)	(b) Including 20% for Kentledge	(b) Including 5% for dewatering, if required	
			31st m	10%	83674.00	100409.00	105429.00	
			32nd	10%	92041.00	110449.00	115971.00	
			33rd m	10%	101245.00	121494.00	127569.00	
			34th m	10%	111370.00	133644.00	140326.00	
			35th m	10%	122507.00	147008.00	154358.00	
			36th m	10%	134758.00	161710.00	169796.00	
			37th m	10%	148234.00	177881.00	186775.00	
			38th m	10%	163057.00	195668.00	205451.00	
			39th m	10%	179363.00	215236.00	225998.00	
			40th m	10%	197299.00	236759.00	248597.00	
			Total Cost from 30m upto 40m		1333548.00	1600258.00	1680270.00	
			<b>Avg Rate per metre</b>		<b>133355.00</b>	<b>160026.00</b>	<b>168027.00</b>	
12.12		C	Soft Rock (6m dia well )					
			Unit = Running Meter.					
			Taking output = 1 m					
			Depth in Soft rock strata up to 3m					
			Rate of sinking = 0.25 m per hour.					
		a)	Labour					
			Mate	day	0.92	272.00	250.24	L-12
			Sinker ( skilled )	day	3.00	325.00	975.00	L-15
			Sinking helper ( semi-skilled )	day	20.00	268.00	5360.00	L-14
			Diver	day	0.50	367.00	183.50	L-07
		b)	Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	1925.00	7700.00	P&M-075
			Air compressor with pneumatic breakers	hour	3.50	934.00	3269.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1096.90	
			Add for dewatering @ of 5 per cent of (a+b), if required				941.73	
		c)	Overhead charges @ 0.21 on (a+b)				4153.04	
		d)	Contractor's profit @ 0.1 on (a+b+c)				2392.94	
			Rate per metre = (a+b+c+d)				26322.35	
						say	<b>26322.00</b>	
12.12		D	Hard Rock (6m dia well )					
			Unit = Running Meter					
			Taking output = 1 m					
			Depth in hard rock strata upto 3 m					
			Rate of sinking = 0.17 m per hour.					
		a)	Material					
			Gelatine 80 per cent	Kg	4.00	781.83	3127.32	M-104
			Electric Detonators	each	18.00	5.73	103.11	M-094/100
		b)	Labour					
			Mate	day	1.56	272.00	424.32	L-12
			Driller	day	2.00	307.00	614.00	L-06
			Blaster	day	0.25	425.00	106.25	L-03
			Mazdoor	day	12.00	257.00	3084.00	L-13
			Mazdoor (Skilled)	day	4.00	325.00	1300.00	L-15
		c)	Machinery					



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		Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
				Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1925.00	11550.00	P&M-075
				Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	934.00	1868.00	P&M-063
				Dewatering @ 5 per cent of cost of (b+c), if required.				947.33	
				Consumables in sinking @ 10 per cent of cost of (c).				1341.80	
				d) Overhead charges @ 0.21 on (a+b+c)				5137.89	
				e) Contractor's profit @ 0.1 on (a+b+c+d)				2960.40	
				Rate per metre = (a+b+c+d+e)				32564.42	
							say	<b>32564.00</b>	
	12.13	Section 1200		Sinking of 7 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
				Unit = Running Meter.					
				Taking output = 1 m					
				Diameter of well - 7 m.					
			A	Sandy Soil					
			(i)	Depth below bed level upto 3.0 M					
				Rate of sinking = 0.30 m per hour.					
				a) Labour					
				Mate	day	0.15	272.00	40.80	L-12
				Sinker ( skilled )	day	1.25	325.00	406.25	L-15
				Sinking helper ( semi-skilled )	day	2.50	268.00	670.00	L-14
				b) Machinery					
				Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	3.25	1925.00	6256.25	P&M-075
				Consumables in sinking @10 per cent of (b)				625.63	
				c) Overhead charges @ 0.21 on (a+b)				1679.77	
				d) Contractor's profit @ 0.1 on (a+b+c)				967.87	
				Rate per metre = (a+b+c+d)				10646.57	
							say	<b>10647.00</b>	
	12.13 A		(ii)	Beyond 3m upto 10m depth					
				Rate of sinking = 0.22 m per hour.					
				a) Labour					
				Mate	day	0.18	272.00	48.96	L-12
				Sinker	day	1.50	325.00	487.50	L-15
				Sinking helper ( semi-skilled )	day	3.00	268.00	804.00	L-14
				b) Machinery					
				Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.50	1925.00	8662.50	P&M-075
				Consumables in sinking @10 per cent of (b)				866.25	
				c) Overhead charges @ 0.21 on (a+b)				2282.53	
				d) Contractor's profit @ 0.1 on (a+b+c)				1315.17	
				Rate per metre = (a+b+c+d)				14466.92	
							say	<b>14467.00</b>	
	12.13 A		(iii)	Beyond 10m upto 20m					
			a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
				11th m	5%	15190.00			
				12th m	5%	15950.00			
				13th m	5%	16748.00			
				14th m	5%	17585.00			
				15th m	5%	18464.00			

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			16th m	5%	19387.00			
			17th m	5%	20356.00			
			18th m	5%	21374.00			
			19th m	5%	22443.00			
			20th m	5%	23565.00			
			Total Cost from 10m upto 20m		191062.00			
			<b>Avg Rate per metre</b>		<b>19106.00</b>			
12.13 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		(a)	(b)Including 20% for Kentledge		
			21st m	7.5%	25332.00	30398.00		
			22nd m	7.5%	27232.00	32678.00		
			23rd m	7.5%	29274.00	35129.00		
			24th m	7.5%	31470.00	37764.00		
			25th m	7.5%	33830.00	40596.00		
			26th m	7.5%	36367.00	43640.00		
			27th m	7.5%	39095.00	46914.00		
			28th m	7.5%	42027.00	50432.00		
			29th m	7.5%	45179.00	54215.00		
			30th m	7.5%	48567.00	58280.00		
			Total Cost from 20m upto 30m		358373.00	430046.00		
			<b>Avg Rate per metre</b>		<b>35837.00</b>	<b>43005.00</b>		
12.13 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.		(a)	(b)Including 20% for Kentledge		
			31st m	10%	53424.00	64109.00		
			32nd	10%	58766.00	70519.00		
			33rd m	10%	64643.00	77572.00		
			34th m	10%	71107.00	85328.00		
			35th m	10%	78218.00	93862.00		
			36th m	10%	86040.00	103248.00		
			37th m	10%	94644.00	113573.00		
			38th m	10%	104108.00	124930.00		
			39th m	10%	114519.00	137423.00		
			40th m	10%	125971.00	151165.00		
			Total Cost from 30m upto 40m		851440.00	1021729.00		
			<b>Avg Rate per metre</b>		<b>85144.00</b>	<b>102173.00</b>		
12.13		B	<b>Clayey Soil ( 7m dia. Well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 cum</b>					
		(I)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking = 0.22 m per hour.					
		a)	<b>Labour</b>					
			Mate	day	0.18	272.00	48.96	L-12
			Sinker ( skilled )	day	1.50	325.00	487.50	L-15
			Sinking helper ( semi-skilled )	day	3.00	268.00	804.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.50	1925.00	8662.50	P&M-075
			Consumables in sinking @ 10 per cent of (b)				866.25	

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			d) Overhead charges @ 0.21 on (a+b)				2282.53	
			e) Contractor's profit @ 0.1 on (a+b+c)				1315.17	
			Rate per metre = (a+b+c+d)				14466.92	
						say	<b>14467.00</b>	
12.13 B		(ii)	Beyond 3m upto 10m depth					
			Rate of sinking = 0.17 m per hour.					
			a) Labour					
			Mate	day	0.26	272.00	70.72	L-12
			Sinker	day	2.00	325.00	650.00	L-15
			Sinking helper ( semi-skilled )	day	4.00	268.00	1072.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1925.00	11550.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.25	934.00	3035.50	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1458.55	
			c) Overhead charges @ 0.21 on (a+b)				3745.72	
			d) Contractor's profit @ 0.1 on (a+b+c)				2158.25	
			Rate per metre = (a+b+c+d)				23740.74	
						say	<b>23741.00</b>	
12.13 B		(iii)	Beyond 10 m upto 20 m					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.			(a) (b) Including for dewatering @ 5% of cost, if required		
			11th m	5%	24928.00	26174.00		
			12th m	5%	26174.00	27483.00		
			13th m	5%	27483.00	28857.00		
			14th m	5%	28857.00	30300.00		
			15th m	5%	30300.00	31815.00		
			16th m	5%	31815.00	33406.00		
			17th m	5%	33406.00	35076.00		
			18th m	5%	35076.00	36830.00		
			19th m	5%	36830.00	38672.00		
			20th m	5%	38672.00	40606.00		
			Total Cost from 10m upto 20m		313541.00	329219.00		
			Avg Rate per metre		<b>31354.00</b>	<b>32922.00</b>		
12.13 B		(iv)	Beyond 20m upto 30 m					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).			(a) (c) Including 25% for Kentledge	(b) Including 5% for dewatering, if required	
			21st m	7.5%	41572.00	51965.00	54563.00	
			22nd	7.5%	44690.00	55863.00	58656.00	
			23rd m	7.5%	48042.00	60053.00	63056.00	
			24th m	7.5%	51645.00	64556.00	67784.00	
			25th m	7.5%	55518.00	69398.00	72868.00	
			26th m	7.5%	59682.00	74603.00	78333.00	
			27th m	7.5%	64158.00	80198.00	84208.00	
			28th m	7.5%	68970.00	86213.00	90524.00	
			29th m	7.5%	74143.00	92679.00	97313.00	
			30th m	7.5%	79704.00	99630.00	104612.00	

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Total Cost from 20m upto 30m		588124.00	735158.00	771917.00	
			<b>Avg Rate per metre</b>		<b>58812.00</b>	<b>73516.00</b>	<b>77192.00</b>	
12.13 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		(a)	(c) Including 20% for Kentledge	(b) Including 5% for dewatering, if required	
			31st m	10%	87674.00	105209.00	110469.00	
			32nd	10%	96441.00	115729.00	121515.00	
			33rd m	10%	106085.00	127302.00	133667.00	
			34th m	10%	116694.00	140033.00	147035.00	
			35th m	10%	128363.00	154036.00	161738.00	
			36th m	10%	141199.00	169439.00	177911.00	
			37th m	10%	155319.00	186383.00	195702.00	
			38th m	10%	170851.00	205021.00	215272.00	
			39th m	10%	187936.00	225523.00	236799.00	
			40th m	10%	206730.00	248076.00	260480.00	
			Total Cost from 30m upto 40m		1397292.00	1676751.00	1760588.00	
			<b>Avg Rate per metre</b>		<b>139729.00</b>	<b>167675.00</b>	<b>176059.00</b>	
12.13		C	<b>Soft Rock ( 7m dia well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in soft rock strata upto 3m</b>					
			Rate of sinking = 0.22 m per hour.					
		a)	<b>Labour</b>					
			Mate	day	0.58	272.00	157.76	L-12
			Sinker ( skilled )	day	4.00	325.00	1300.00	L-15
			Sinking helper ( semi-skilled )	day	10.00	268.00	2680.00	L-14
			Diver	day	0.75	367.00	275.25	L-07
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.50	1925.00	8662.50	P&M-075
			Air compressor with pneumatic breakers	hour	3.75	934.00	3502.50	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1216.50	
			Add for dewatering @ of 5 per cent of (a+b), if required				828.90	
		c)	<b>Overhead charges @ 0.21 on (a+b)</b>				3910.92	
		d)	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				2253.43	
			<b>Rate per metre = (a+b+c+d)</b>				24787.76	
						<b>say</b>	<b>24788.00</b>	
12.13		D	<b>Hard Rock ( 7m dia well )</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in Hard rock strata up to 3 m</b>					
			Rate of sinking = 0.17 m per hour.					
		a)	<b>Material</b>					
			Gelatine 80 per cent	Kg	7.00	781.83	5472.81	M-104
			Electric Detonators	each	30.00	5.73	171.86	M-094/100
		b)	<b>Labour</b>					
			Mate	day	1.60	272.00	435.20	L-12
			Driller	day	2.00	307.00	614.00	L-06
			Blaster	day	0.25	425.00	106.25	L-03
			Mazdoor	day	18.00	257.00	4626.00	L-13

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Mazdoor (Skilled)	day	4.00	325.00	1300.00	L-15
			Diver	day	0.50	367.00	183.50	L-07
			<b>c) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1925.00	11550.00	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	934.00	1868.00	P&M-063
			Dewatering @ 5 per cent of cost of (b+c), if required.				1034.15	
			Consumables in sinking @ 10 per cent of cost of (c).				1445.21	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				6049.47	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				3485.64	
			<b>Rate per metre = (a+b+c+d+e)</b>				38342.09	
						<b>say</b>	<b>38342.00</b>	
12.14	Section 1200		Sinking of 8 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			<i>Unit = Running Meter.</i>					
			<i>Taking output = 1 m</i>					
			<i>Diameter of well - 8 m.</i>					
		<b>A</b>	<b>Sandy Soil</b>					
		(i)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking @ 0.25 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.18	272.00	48.96	L-12
			Sinker ( skilled )	day	1.50	325.00	487.50	L-15
			Sinking helper ( semi-skilled )	day	3.00	268.00	804.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	1925.00	7700.00	P&M-075
			Consumables in sinking @10 per cent of (b)				770.00	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				2060.20	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1187.07	
			<b>Rate per metre = (a+b+c+d)</b>				13057.72	
						<b>say</b>	<b>13058.00</b>	
12.14 A		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking @ 0.20 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.25	272.00	68.00	L-12
			Sinker	day	1.75	325.00	568.75	L-15
			Sinking helper ( semi-skilled )	day	3.50	268.00	938.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	1925.00	9625.00	P&M-075
			Consumables in sinking @10 per cent of (b)				962.50	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				2554.07	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1471.63	
			<b>Rate per metre = (a+b+c+d)</b>				16187.95	
						<b>say</b>	<b>16188.00</b>	
12.14 A		(iii)	<b>Beyond 10m upto 20m</b>					
		<b>a</b>	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
			11th m	5%	16997.00			
			12th m	5%	17847.00			

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			13th m	5%	18739.00			
			14th m	5%	19676.00			
			15th m	5%	20660.00			
			16th m	5%	21693.00			
			17th m	5%	22778.00			
			18th m	5%	23917.00			
			19th m	5%	25113.00			
			20th m	5%	26369.00			
			Total Cost from 10m upto 20m		213789.00			
			<b>Avg Rate per metre</b>		<b><u>21379.00</u></b>			
12.14 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		(a)	(b) Including 20% for Kentledge		
			21st m	7.5%	28347.00	34016.00		
			22nd m	7.5%	30473.00	36568.00		
			23rd m	7.5%	32758.00	39310.00		
			24th m	7.5%	35215.00	42258.00		
			25th m	7.5%	37856.00	45427.00		
			26th m	7.5%	40695.00	48834.00		
			27th m	7.5%	43747.00	52496.00		
			28th m	7.5%	47028.00	56434.00		
			29th m	7.5%	50555.00	60666.00		
			30th m	7.5%	54347.00	65216.00		
			Total Cost from 20m upto 30m		401021.00	481225.00		
			<b>Avg Rate per metre</b>		<b><u>40102.00</u></b>	<b><u>48123.00</u></b>		
12.14 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.		(a)	(b) Including 20% for Kentledge		
			31st m	10%	59782.00	71738.00		
			32nd	10%	65760.00	78912.00		
			33rd m	10%	72336.00	86803.00		
			34th m	10%	79570.00	95484.00		
			35th m	10%	87527.00	105032.00		
			36th m	10%	96280.00	115536.00		
			37th m	10%	105908.00	127090.00		
			38th m	10%	116499.00	139799.00		
			39th m	10%	128149.00	153779.00		
			40th m	10%	140964.00	169157.00		
			Total Cost from 30m upto 40m		952775.00	1143330.00		
			<b>Avg Rate per metre</b>		<b><u>95278.00</u></b>	<b><u>114333.00</u></b>		
12.14		B	<b>Clayey Soil ( 8m dia. Well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 meter</b>					
		(i)	<b>Depth from bed level upto 3.0 M</b>					
			Rate of sinking @ 0.18 m/hour					
		a)	<b>Labour</b>					
			Mate	day	0.22	272.00	59.84	L-12
			Sinker ( skilled )	day	2.00	325.00	650.00	L-15
			Sinking helper ( semi-skilled )	hour	3.50	268.00	938.00	L-14
		b)	<b>Machinery</b>					

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.		5.50	1925.00	10587.50	P&M-075
			Consumables in sinking @ 10 per cent of (b)				1058.75	
			c) Overhead charges @ 0.21 on (a+b)				2791.76	
			d) Contractor's profit @ 0.1 on (a+b+c)				1608.58	
			Rate per metre = (a+b+c+d)				17694.43	
						say	<b>17694.00</b>	
12.14 B		(ii)	Beyond 3m upto 10m depth					
			Rate of sinking @ 0.17 m/hour					
			a) Labour					
			Mate	day	0.32	272.00	87.04	L-12
			Sinker	day	2.50	325.00	812.50	L-15
			Sinking helper ( semi-skilled )	day	4.50	268.00	1206.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1925.00	11550.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.50	934.00	3269.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1481.90	
			c) Overhead charges @ 0.21 on (a+b)				3865.35	
			d) Contractor's profit @ 0.1 on (a+b+c)				2227.18	
			Rate per metre = (a+b+c+d)				24498.97	
						say	<b>24499.00</b>	
12.14 B		(iii)	Beyond 10 m upto 20 m					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.			(a) (b) Including for dewatering @ 5% of cost, if required		
			11th m	5%	25724.00	27010.00		
			12th m	5%	27010.00	28361.00		
			13th m	5%	28361.00	29779.00		
			14th m	5%	29779.00	31268.00		
			15th m	5%	31268.00	32831.00		
			16th m	5%	32831.00	34473.00		
			17th m	5%	34473.00	36197.00		
			18th m	5%	36197.00	38007.00		
			19th m	5%	38007.00	39907.00		
			20th m	5%	39907.00	41902.00		
			Total Cost from 10m upto 20m		323557.00	339735.00		
			Avg Rate per metre		<b>32356.00</b>	<b>33974.00</b>		
12.14 B		(iv)	Beyond 20m upto 30 m					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).			(a) (c) Including 25% for Kentledge	(b) Including 5% for dewatering, if required	
			21st m	7.5%	42900.00	53625.00	56306.00	
			22nd	7.5%	46118.00	57648.00	60530.00	
			23rd m	7.5%	49577.00	61971.00	65070.00	
			24th m	7.5%	53295.00	66619.00	69950.00	
			25th m	7.5%	57292.00	71615.00	75196.00	
			26th m	7.5%	61589.00	76986.00	80835.00	
			27th m	7.5%	66208.00	82760.00	86898.00	

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	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			28th m	7.5%	71174.00	88968.00	93416.00	
			29th m	7.5%	76512.00	95640.00	100422.00	
			30th m	7.5%	82250.00	102813.00	107954.00	
			Total Cost from 20m upto 30m		606915.00	758645.00	796577.00	
			<b>Avg Rate per metre</b>		<b>60692.00</b>	<b>75865.00</b>	<b>79658.00</b>	
12.14 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		(a)	(c ) Including 20% for Kentledge	(b) Including 5% for dewatering, if required	
			31st m	10%	90475.00	108570.00	113999.00	
			32nd	10%	99523.00	119428.00	125399.00	
			33rd m	10%	109475.00	131370.00	137939.00	
			34th m	10%	120423.00	144508.00	151733.00	
			35th m	10%	132465.00	158958.00	166906.00	
			36th m	10%	145712.00	174854.00	183597.00	
			37th m	10%	160283.00	192340.00	201957.00	
			38th m	10%	176311.00	211573.00	222152.00	
			39th m	10%	193942.00	232730.00	244367.00	
			40th m	10%	213336.00	256003.00	268803.00	
			Total Cost from 30m upto 40m		1441945.00	1730334.00	1816852.00	
			<b>Avg Rate per metre</b>		<b>144195.00</b>	<b>173033.00</b>	<b>181685.00</b>	
12.14		C	<b>Soft Rock ( 8m dia well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in soft rock strata upto 3m</b>					
			Rate of sinking @ 0.20 m/hour					
		a)	<b>Labour</b>					
			Mate	day	0.68	272.00	184.96	L-12
			Sinker ( skilled )	day	4.00	325.00	1300.00	L-15
			Sinking helper ( semi-skilled )	day	12.00	268.00	3216.00	L-14
			Diver	day	1.00	367.00	367.00	L-07
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	1925.00	9625.00	P&M-075
			Air compressor with pneumatic breakers	hour	3.75	934.00	3502.50	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1312.75	
			Add for dewatering @ of 5 per cent of (a+b), if required				975.41	
		c)	<b>Overhead charges @ 0.21 on (a+b)</b>				4301.56	
		d)	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				2478.52	
			<b>Rate per metre = (a+b+c+d)</b>				27263.70	
						<b>say</b>	<b>27264.00</b>	
12.14		D	<b>Hard Rock ( 8m dia well )</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in hard rock strata upto 3m</b>					
			Rate of sinking @ 0.17 m/hour					
		a)	<b>Material</b>					
			Gelatine 80 per cent	Kg	8.00	781.83	6254.64	M-104
			Electric Detonators	each	32.00	5.73	183.32	M-094/100
		b)	<b>Labour</b>					
			Mate	day	1.09	272.00	296.48	L-12



# Analysis of Rates

## FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Driller	day	2.00	307.00	614.00	L-06
			Blaster	day	0.25	425.00	106.25	L-03
			Mazdoor	day	20.00	257.00	5140.00	L-13
			Mazdoor (Skilled)	day	4.00	325.00	1300.00	L-15
			<b>c) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1925.00	11550.00	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	934.00	1868.00	P&M-063
			Dewatering @ 5 per cent of cost of (b+c), if required.				1043.74	
			Consumables in sinking @ 10 per cent of cost of (b).				745.67	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				6111.44	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				3521.35	
			<b>Rate per metre = (a+b+c+d+e)</b>				38734.89	
						<b>say</b>	<b>38735.00</b>	
12.15	Section 1200		Sinking of 9 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			<i>Unit = Running Meter.</i>					
			<i>Taking output = 1 m</i>					
			<i>Diameter of well - 9 m.</i>					
		<b>A</b>	<b>Sandy Soil</b>					
		<b>(i)</b>	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking @ 0.25 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.19	272.00	51.68	L-12
			Sinker ( skilled )	day	1.50	325.00	487.50	L-15
			Sinking helper ( semi-skilled )	day	3.25	268.00	871.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	1925.00	7700.00	P&M-075
			Consumables in sinking @10 per cent of (b)				770.00	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				2074.84	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1195.50	
			<b>Rate per metre = (a+b+c+d)</b>				13150.52	
						<b>say</b>	<b>13151.00</b>	
12.15 A		<b>(ii)</b>	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking @ 0.18 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.27	272.00	73.44	L-12
			Sinker	day	1.75	325.00	568.75	L-15
			Sinking helper ( semi-skilled )	day	4.00	268.00	1072.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.50	1925.00	10587.50	P&M-075
			Consumables in sinking @10 per cent of (b)				1058.75	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				2805.69	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1616.61	
			<b>Rate per metre = (a+b+c+d)</b>				17782.75	
						<b>say</b>	<b>17783.00</b>	
12.15 A		<b>(iii)</b>	<b>Beyond 10m upto 20m</b>					
		<b>a</b>	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					

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Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			11th m	5%	18672.00			
			12th m	5%	19606.00			
			13th m	5%	20586.00			
			14th m	5%	21615.00			
			15th m	5%	22696.00			
			16th m	5%	23831.00			
			17th m	5%	25023.00			
			18th m	5%	26274.00			
			19th m	5%	27588.00			
			20th m	5%	28967.00			
			Total Cost from 10m upto 20m		234858.00			
			<b>Avg Rate per metre</b>		<b>23486.00</b>			
12.15 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		(a)	(b) Including 20% for Kentledge		
			21st m	7.5%	31139.53	37367.00		
			22nd m	7.5%	33475.00	40170.00		
			23rd m	7.5%	35986.00	43183.00		
			24th m	7.5%	38685.00	46422.00		
			25th m	7.5%	41586.00	49903.00		
			26th m	7.5%	44705.00	53646.00		
			27th m	7.5%	48058.00	57670.00		
			28th m	7.5%	51662.00	61994.00		
			29th m	7.5%	55537.00	66644.00		
			30th m	7.5%	59702.00	71642.00		
			Total Cost from 20m upto 30m		440535.53	528641.00		
			<b>Avg Rate per metre</b>		<b>44054.00</b>	<b>52864.00</b>		
12.15 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.		(a)	(b) Including 20% for Kentledge		
			31st m	10%	65672.20	78807.00		
			32nd	10%	72239.00	86687.00		
			33rd m	10%	79463.00	95356.00		
			34th m	10%	87409.00	104891.00		
			35th m	10%	96150.00	115380.00		
			36th m	10%	105765.00	126918.00		
			37th m	10%	116342.00	139610.00		
			38th m	10%	127976.00	153571.00		
			39th m	10%	140774.00	168929.00		
			40th m	10%	154851.00	185821.00		
			Total Cost from 30m upto 40m		1046641.20	1255970.00		
			<b>Avg Rate per metre</b>		<b>104664.00</b>	<b>125597.00</b>		
12.15		B	<b>Clayey Soil ( 9m dia. Well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 cum</b>					
		(i)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking 0.17 m / hour					
		a)	<b>Labour</b>					
			Mate	day	0.24	272.00	65.28	L-12
			Sinker ( skilled )	day	2.25	325.00	731.25	L-15

Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Sinking helper ( semi-skilled )	day	3.75	268.00	1005.00	L-14
		<b>b)</b>	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.75	1925.00	11068.75	P&M-075
			Consumables in sinking @ 10 per cent of (b)				1106.88	
		<b>c)</b>	<b>Overhead charges @ 0.21 on (a+b)</b>				2935.20	
		<b>d)</b>	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				1691.24	
			<b>Rate per metre = (a+b+c+d)</b>				18603.59	
						<b>say</b>	<b>18604.00</b>	
<b>12.15 B</b>		<b>(ii)</b>	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking 0.15 m / hour					
		<b>a)</b>	<b>Labour</b>					
			Mate	day	0.34	272.00	92.48	L-12
			Sinker	day	2.50	325.00	812.50	L-15
			Sinking helper ( semi-skilled )	day	5.00	268.00	1340.00	L-14
		<b>b)</b>	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	1925.00	12512.50	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.75	934.00	3502.50	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1601.50	
		<b>c)</b>	<b>Overhead charges @ 0.21 on (a+b)</b>				4170.91	
		<b>d)</b>	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				2403.24	
			<b>Rate per metre = (a+b+c+d)</b>				26435.63	
						<b>say</b>	<b>26436.00</b>	
<b>12.15 B</b>		<b>(iii)</b>	<b>Beyond 10 m upto 20 m</b>					
		<b>a</b>	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		<b>b</b>	Add for dewatering @ 5 per cent of cost, if required.			(a) (b) Including for dewatering @ 5% of cost, if required		
			11th m	5%	27758.00	29146.00		
			12th m	5%	29146.00	30603.00		
			13th m	5%	30603.00	32133.00		
			14th m	5%	32133.00	33740.00		
			15th m	5%	33740.00	35427.00		
			16th m	5%	35427.00	37198.00		
			17th m	5%	37198.00	39058.00		
			18th m	5%	39058.00	41011.00		
			19th m	5%	41011.00	43062.00		
			20th m	5%	43062.00	45215.00		
			Total Cost from 10m upto 20m		349136.00	366593.00		
			<b>Avg Rate per metre</b>		<b>34914.00</b>	<b>36659.00</b>		
<b>12.15 B</b>		<b>(iv)</b>	<b>Beyond 20m upto 30 m</b>					
		<b>a</b>	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		<b>b</b>	Add 5 per cent of cost for dewatering on the cost, if required					
		<b>c</b>	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).			(a) (c) Including 25% for Kentledge	(b) Including 5% for dewatering, if required	
			21st m	7.5%	46292.00	57865.00	60758.00	
			22nd	7.5%	49764.00	62205.00	65315.00	
			23rd m	7.5%	53496.00	66870.00	70214.00	
			24th m	7.5%	57508.00	71885.00	75479.00	
			25th m	7.5%	61821.00	77276.00	81140.00	

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# Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			26th m	7.5%	66458.00	83073.00	87227.00	
			27th m	7.5%	71442.00	89303.00	93768.00	
			28th m	7.5%	76800.00	96000.00	100800.00	
			29th m	7.5%	82560.00	103200.00	108360.00	
			30th m	7.5%	88752.00	110940.00	116487.00	
			Total Cost from 20m upto 30m		654893.00	818617.00	859548.00	
			<b>Avg Rate per metre</b>		<b>65489.00</b>	<b>81862.00</b>	<b>85955.00</b>	
12.15 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		(a)	(c) Including 20% for Kentledge	(b) Including 5% for dewatering, if required	
			31st m	10%	97627.00	117152.00	123010.00	
			32nd	10%	107390.00	128868.00	135311.00	
			33rd m	10%	118129.00	141755.00	148843.00	
			34th m	10%	129942.00	155930.00	163727.00	
			35th m	10%	142936.00	171523.00	180099.00	
			36th m	10%	157230.00	188676.00	198110.00	
			37th m	10%	172953.00	207544.00	217921.00	
			38th m	10%	190248.00	228298.00	239713.00	
			39th m	10%	209273.00	251128.00	263684.00	
			40th m	10%	230200.00	276240.00	290052.00	
			Total Cost from 30m upto 40m		1555928.00	1867114.00	1960470.00	
			<b>Avg Rate per metre</b>		<b>155593.00</b>	<b>186711.00</b>	<b>196047.00</b>	
12.15		C	<b>Soft Rock ( 9m dia well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in soft rock strata up to 3m</b>					
			Rate of sinking 0.15 m / hour					
		a)	<b>Labour</b>					
			Mate	day	0.76	272.00	206.72	L-12
			Sinker ( skilled )	day	4.00	325.00	1300.00	L-15
			Sinking helper ( semi-skilled )	day	14.00	268.00	3752.00	L-14
			Diver	day	1.20	367.00	440.40	L-07
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	1925.00	12512.50	P&M-075
			Air compressor with pneumatic breakers	hour	4.00	934.00	3736.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1624.85	
			Add for dewatering @ of 10 per cent of (a+b), if required				2357.25	
		c)	<b>Overhead charges @ 0.21 on (a+b)</b>				5445.24	
		d)	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				3137.50	
			<b>Rate per metre = (a+b+c+d)</b>				34512.45	
						<b>say</b>	<b>34512.00</b>	
12.15		D	<b>Hard Rock ( 9m dia well )</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in hard rock strata upto 3 m</b>					
			Rate of sinking 0.15 m / hour					
		a)	<b>Material</b>					
			Gelatine 80 per cent	Kg	10.00	781.83	7818.30	M-104
			Electric Detonators	each	40.00	5.73	229.14	M-094/100

Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>b) Labour</b>					
			Mate	day	1.17	272.00	318.24	L-12
			Driller	day	2.00	307.00	614.00	L-06
			Blaster	day	0.25	425.00	106.25	L-03
			Mazdoor	day	22.00	257.00	5654.00	L-13
			Mazdoor (Skilled)	day	4.00	325.00	1300.00	L-15
			Diver	day	1.00	367.00	367.00	L-07
			<b>c) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	7.00	1925.00	13475.00	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.50	934.00	2335.00	P&M-063
			Dewatering @ 5 per cent of cost of (b+c), if required.				1208.47	
			Consumables in sinking @ 10 per cent of cost of (b).				835.95	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				7194.89	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				4145.62	
			<b>Rate per metre = (a+b+c+d+e)</b>				45601.87	
						<b>say</b>	<b>45602.00</b>	
12.16	1200		Sinking of 10 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			<i>Unit = Running Meter</i>					
			<i>Taking output = 1 m</i>					
			Diameter of well - 10 m.					
		<b>A</b>	<b>Sandy Soil</b>					
		<b>(i)</b>	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking 0.20 m / hour					
			<b>a) Labour</b>					
			Mate	day	0.20	272.00	54.40	L-12
			Sinker ( skilled )	day	1.50	325.00	487.50	L-15
			Sinking helper ( semi-skilled )	day	3.50	268.00	938.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	1925.00	9625.00	P&M-075
			Consumables in sinking @10 per cent of (b)				962.50	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				2534.15	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1460.16	
			<b>Rate per metre = (a+b+c+d)</b>				16061.71	
						<b>say</b>	<b>16062.00</b>	
12.16 A		<b>(ii)</b>	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking 0.17 m / hour					
			<b>a) Labour</b>					
			Mate	day	0.31	272.00	84.32	L-12
			Sinker	day	2.00	325.00	650.00	L-15
			Sinking helper ( semi-skilled )	day	4.25	268.00	1139.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.75	1925.00	11068.75	P&M-075
			Consumables in sinking @10 per cent of (b)				1106.88	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				2950.28	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1699.92	
			<b>Rate per metre = (a+b+c+d)</b>				18699.15	
						<b>say</b>	<b>18699.00</b>	

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Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
12.16 A		(iii)	<b>Beyond 10m upto 20m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
			11th m	5%	19634.00			
			12th m	5%	20616.00			
			13th m	5%	21647.00			
			14th m	5%	22729.00			
			15th m	5%	23865.00			
			16th m	5%	25058.00			
			17th m	5%	26311.00			
			18th m	5%	27627.00			
			19th m	5%	29008.00			
			20th m	5%	30458.00			
			Total Cost from 10m upto 20m				246953.00	
			<b>Avg Rate per metre</b>			<b>24695.00</b>		
12.16 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		(a)	(b) Including 20% for Kentledge		
			21st m	7.5%	32742.00	39290.00		
			22nd m	7.5%	35198.00	42238.00		
			23rd m	7.5%	37838.00	45406.00		
			24th m	7.5%	40676.00	48811.00		
			25th m	7.5%	43727.00	52472.00		
			26th m	7.5%	47007.00	56408.00		
			27th m	7.5%	50533.00	60640.00		
			28th m	7.5%	54323.00	65188.00		
			29th m	7.5%	58397.00	70076.00		
			30th m	7.5%	62777.00	75332.00		
			Total Cost from 20m upto 30m				463218.00	555861.00
			<b>Avg Rate per metre</b>			<b>46322.00</b>	<b>55586.00</b>	
12.16 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.		(a)	(b) Including 20% for Kentledge		
			31st m	10%	69055.00	82866.00		
			32nd	10%	75961.00	91153.00		
			33rd m	10%	83557.00	100268.00		
			34th m	10%	91913.00	110296.00		
			35th m	10%	101104.00	121325.00		
			36th m	10%	111214.00	133457.00		
			37th m	10%	122335.00	146802.00		
			38th m	10%	134569.00	161483.00		
			39th m	10%	148026.00	177631.00		
			40th m	10%	162829.00	195395.00		
			Total Cost from 30m upto 40m				1100563.00	1320676.00
			<b>Avg Rate per metre</b>			<b>110056.00</b>	<b>132068.00</b>	
12.16		B	<b>Clayey Soil (10m dia. Well )</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 1 cum</b>					
		(i)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking 0.18m/hour.					

Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>a) Labour</b>					
			Mate	day	0.25	272.00	68.00	L-12
			Sinker ( skilled )	day	2.50	325.00	812.50	L-15
			Sinking helper ( semi-skilled )	day	5.50	268.00	1474.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1925.00	11550.00	P&M-075
			Consumables in sinking @ 10 per cent of (b)				1155.00	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				3162.50	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1822.20	
			<b>Rate per metre = (a+b+c+d)</b>				20044.19	
						<b>say</b>	<b>20044.00</b>	
12.16 B		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking 0.15m/hour.					
			<b>a) Labour</b>					
			Mate	day	0.40	272.00	108.80	L-12
			Sinker	day	3.00	325.00	975.00	L-15
			Sinking helper ( semi-skilled )	day	5.50	268.00	1474.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1925.00	11550.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay	hour	4.00	934.00	3736.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1528.60	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				4068.20	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2344.06	
			<b>Rate per metre = (a+b+c+d)</b>				25784.66	
						<b>say</b>	<b>25785.00</b>	
12.16 B		(iii)	<b>Beyond 10 m upto 20 m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.		(a)	(b) Including for dewatering @ 5% of cost, if required		
			11th m	5%	27074.00	28428.00		
			12th m	5%	28428.00	29849.00		
			13th m	5%	29849.00	31341.00		
			14th m	5%	31341.00	32908.00		
			15th m	5%	32908.00	34553.00		
			16th m	5%	34553.00	36281.00		
			17th m	5%	36281.00	38095.00		
			18th m	5%	38095.00	40000.00		
			19th m	5%	40000.00	42000.00		
			20th m	5%	42000.00	44100.00		
			Total Cost from 10m upto 20m		340529.00	357555.00		
			<b>Avg Rate per metre</b>		<b>34053.00</b>	<b>35756.00</b>		
12.16 B		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).		(a)	(c) Including 25% for Kentledge	(b) Including 5% for dewatering, if required	
			21st m	7.5%	45150.00	56438.00	59260.00	
			22nd	7.5%	48536.00	60670.00	63704.00	

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# Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			23rd m	7.5%	52176.00	65220.00	68481.00	
			24th m	7.5%	56089.00	70111.00	73617.00	
			25th m	7.5%	60296.00	75370.00	79139.00	
			26th m	7.5%	64818.00	81023.00	85074.00	
			27th m	7.5%	69679.00	87099.00	91454.00	
			28th m	7.5%	74905.00	93631.00	98313.00	
			29th m	7.5%	80523.00	100654.00	105687.00	
			30th m	7.5%	86562.00	108203.00	113613.00	
			Total Cost from 20m upto 30m		638734.00	798419.00	838342.00	
			<b>Avg Rate per metre</b>		<b>63873.00</b>	<b>79842.00</b>	<b>83834.00</b>	
12.16 B		(v)	Beyond 30m upto 40 m					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		(a)	(c) Including 20% for Kentledge	(b) Including 5% for dewatering, if required	
			31st m	10%	95218.00	114262.00	119975.00	
			32nd	10%	104740.00	125688.00	131972.00	
			33rd m	10%	115214.00	138257.00	145169.85	
			34th m	10%	126735.00	152082.00	159686.10	
			35th m	10%	139409.00	167291.00	175655.55	
			36th m	10%	153350.00	184020.00	193221.00	
			37th m	10%	168685.00	202422.00	212543.10	
			38th m	10%	185554.00	222665.00	233798.25	
			39th m	10%	204109.00	244931.00	257177.55	
			40th m	10%	224520.00	269424.00	282895.20	
			Total Cost from 30m upto 40m		1517534.00	1821042.00	1912093.60	
			<b>Avg Rate per metre</b>		<b>151753.00</b>	<b>182104.00</b>	<b>191209.00</b>	
12.16		C	Soft Rock (10m dia well )					
			Unit = Running Meter.					
			Taking output = 1 m					
			Depth in soft rock strata upto 3m					
			Rate of sinking 0.14m/hour.					
		a)	Labour					
			Mate	day	0.86	272.00	233.92	L-12
			Sinker ( skilled )	day	4.00	325.00	1300.00	L-15
			Sinking helper ( semi-skilled )	day	16.00	268.00	4288.00	L-14
			Diver	day	1.40	367.00	513.80	L-07
		b)	Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	7.00	1925.00	13475.00	P&M-075
			Air compressor with pneumatic breakers	hour	4.25	934.00	3969.50	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1744.45	
			Add for dewatering @ 5 per cent of cost, if required				959.45	
		c)	Overhead charges @ 0.21 on (a+b)				5561.66	
		d)	Contractor's profit @ 0.1 on (a+b+c)				3204.58	
			Rate per metre = (a+b+c+d)				35250.36	
						say	<b>35250.00</b>	
12.16		D	Hard Rock (10m dia well )					
			Unit = Running Meter.					
			Taking output = 1 m					
			Depth in hard rock strata upto 3 m					
			Rate of sinking 0.12 m/ hour.					



Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>a) Material</b>					
			Gelatine 80 per cent	Kg	11.00	781.83	8600.13	M-104
			Electric Detonators	each.	44.00	5.73	252.06	M-094/100
			<b>b) Labour</b>					
			Mate	day	1.27	272.00	345.44	L-12
			Driller	day	2.00	307.00	614.00	L-06
			Blaster	day	0.25	425.00	106.25	L-03
			Mazdoor	day	24.00	257.00	6168.00	L-13
			Mazdoor (Skilled)	day	4.00	325.00	1300.00	L-15
			<b>c) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.50	1925.00	16362.50	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.00	934.00	2802.00	P&M-063
			Dewatering @ 5 per cent of cost (c), if required.				958.23	
			Consumables in sinking @ 10 per cent of cost of (b+c).				2865.64	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				8478.59	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				4885.28	
			<b>Rate per metre = (a+b+c+d+e)</b>				53738.12	
						<b>say</b>	<b>53738.00</b>	
12.17	1200		Sinking of 11 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			<i>Unit = Running Meter</i>					
			<i>Taking output = 0.50 m</i>					
			Diameter of well - 11 m.					
		<b>A</b>	<b>Sandy Soil</b>					
		<b>(i)</b>	<b>Depth from bed level upto 3.0 M</b>					
			Rate of sinking @ 0.15 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.21	272.00	57.12	L-12
			Sinker ( skilled )	day	1.50	325.00	487.50	L-15
			Sinking helper (semi-skilled)	day	3.30	268.00	884.40	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1925.00	11550.00	P&M-075
			Consumables in sinking @10 per cent of (b)				1155.00	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				2968.14	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1710.22	
			Cost for 0.5 m = a+b+c				18812.38	
			<b>Rate per metre = (a+b+c) / 0.50</b>				37624.76	
						<b>say</b>	<b>37625.00</b>	
12.17 A		<b>(ii)</b>	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking @ 0.13 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.32	272.00	87.04	L-12
			Sinker	day	2.00	325.00	650.00	L-15
			Sinking helper (semi-skilled)	day	4.50	268.00	1206.00	L-14
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	1925.00	7700.00	P&M-075
			Consumables in sinking @10 per cent of (b)				770.00	

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**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			c) Overhead charges @ 0.21 on (a+b+c)				2186.74	
			d) Contractor's profit @ 0.1 on (a+b+c+d)				1259.98	
			Cost for 0.5m = a+b+c+d				13859.76	
			Rate per metre = (a+b+c+d)/0.50				27719.51	
						say	<b>27720.00</b>	
12.17 A		(iii)	Beyond 10m upto 20m					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
			11th m	5%	29105.00			
			12th m	5%	30560.00			
			13th m	5%	32088.00			
			14th m	5%	33692.00			
			15th m	5%	35377.00			
			16th m	5%	37146.00			
			17th m	5%	39003.00			
			18th m	5%	40953.00			
			19th m	5%	43001.00			
			20th m	5%	45151.00			
			Total Cost from 10m upto 20m		366076.00			
			Avg Rate per metre		<b>36608.00</b>			
12.17 A		(iv)	Beyond 20m upto 30 m					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		(a)	(b) Including 20% for Kentledge		
			21st m	7.5%	48537.00	58244.00		
			22nd m	7.5%	52177.00	62612.00		
			23rd m	7.5%	56090.00	67308.00		
			24th m	7.5%	60297.00	72356.00		
			25th m	7.5%	64819.00	77783.00		
			26th m	7.5%	69680.00	83616.00		
			27th m	7.5%	74906.00	89887.00		
			28th m	7.5%	80524.00	96629.00		
			29th m	7.5%	86563.00	103876.00		
			30th m	7.5%	93055.00	111666.00		
			Total Cost from 20m upto 30m		686648.00	823977.00		
			Avg Rate per metre		<b>68665.00</b>	<b>82398.00</b>		
12.17 A		(v)	Beyond 30m upto 40 m					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.		(a)	(b) Including 20% for Kentledge		
			31st m	10%	102361.00	122833.00		
			32nd	10%	112597.00	135116.00		
			33rd m	10%	123857.00	148628.00		
			34th m	10%	136243.00	163492.00		
			35th m	10%	149867.00	179840.00		
			36th m	10%	164854.00	197825.00		
			37th m	10%	181339.00	217607.00		
			38th m	10%	199473.00	239368.00		
			39th m	10%	219420.00	263304.00		
			40th m	10%	241362.00	289634.00		
			Total Cost from 30m upto 40m		1631373.00	1957647.00		
			Avg Rate per metre		<b>163137.00</b>	<b>195765.00</b>		

Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
12.17		B	Clayey Soil (11 m dia. Well )					
			Unit = Running Meter					
			Taking output = 0.50 meter					
		(i)	Depth from bed level upto 3.0 M					
			Rate of sinking @ 0.10 m/hour					
			a) Labour					
			Mate	day	0.26	272.00	70.72	L-12
			Sinker ( skilled )	day	2.50	325.00	812.50	L-15
			Sinking helper (semi-skilled)	day	4.00	268.00	1072.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	1925.00	9625.00	P&M-075
			Consumables in sinking @ 10 per cent of (b)				962.50	
			c) Overhead charges @ 0.21 on (a+b)				2633.97	
			d) Contractor's profit @ 0.1 on (a+b+c)				1517.67	
			Cost for 0.5m = a+b+c+d				16694.36	
			Rate per metre = (a+b+c+d)/0.50				33388.72	
						say	<b>33389.00</b>	
12.17 B		(ii)	Beyond 3m upto 10m depth					
			Rate of sinking @ 0.08 m/hour					
			a) Labour					
			Mate	day	0.43	272.00	116.96	L-12
			Sinker	day	3.50	325.00	1137.50	L-15
			Sinking helper (semi-skilled)	day	5.75	268.00	1541.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1925.00	11550.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay	hour	4.25	934.00	3969.50	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1551.95	
			c) Overhead charges @ 0.21 on (a+b)				4172.05	
			d) Contractor's profit @ 0.1 on (a+b+c)				2403.90	
			Cost for 0.5m = a+b+c+d				26442.86	
			Rate per metre = (a+b+c+d)/0.50				52885.71	
						say	<b>52886.00</b>	
12.17 B		(iii)	Beyond 10 m upto 20 m					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.		(a)	(b) Including for dewatering @ 5% of cost, if required		
			11th m	5%	55530.00	58307.00		
			12th m	5%	58307.00	61222.00		
			13th m	5%	61222.00	64283.00		
			14th m	5%	64283.00	67497.00		
			15th m	5%	67497.00	70872.00		
			16th m	5%	70872.00	74416.00		
			17th m	5%	74416.00	78137.00		
			18th m	5%	78137.00	82044.00		
			19th m	5%	82044.00	86146.00		
			20th m	5%	86146.00	90453.00		
			Total Cost from 10m upto 20m		698454.00	733377.00		
			Avg Rate per metre		<b>69845.00</b>	<b>73338.00</b>		
12.17 B		(iv)	Beyond 20m upto 30 m					

## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).		(a)	(c)Including 25% for Kentledge	(b)Including 5% for dewatering, if required	
			21st m	7.5%	92607.00	115759.00	121547.00	
			22nd	7.5%	99553.00	124441.00	130663.00	
			23rd m	7.5%	107019.00	133774.00	140463.00	
			24th m	7.5%	115045.00	143806.00	150996.00	
			25th m	7.5%	123673.00	154591.00	162321.00	
			26th m	7.5%	132948.00	166185.00	174494.00	
			27th m	7.5%	142919.00	178649.00	187581.00	
			28th m	7.5%	153638.00	192048.00	201650.00	
			29th m	7.5%	165161.00	206451.00	216774.00	
			30th m	7.5%	177548.00	221935.00	233032.00	
			Total Cost from 20m upto 30m		1310111.00	1637639.00	1719521.00	
			<b>Avg Rate per metre</b>		<b>131011.00</b>	<b>163764.00</b>	<b>171952.00</b>	
12.17 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		(a)	(c ) Including 20% for Kentledge	(b)Including 5% for dewatering, if required	
			31st m	10%	195303.00	234364.00	246082.00	
			32nd	10%	214833.00	257800.00	270690.00	
			33rd m	10%	236316.00	283579.00	297758.00	
			34th m	10%	259948.00	311938.00	327535.00	
			35th m	10%	285943.00	343132.00	360289.00	
			36th m	10%	314537.00	377444.00	396316.00	
			37th m	10%	345991.00	415189.00	435948.00	
			38th m	10%	380590.00	456708.00	479543.00	
			39th m	10%	418649.00	502379.00	527498.00	
			40th m	10%	460514.00	552617.00	580248.00	
			Total Cost from 30m upto 40m		3112624	3735150	3921907	
			<b>Avg Rate per metre</b>		<b>311262.00</b>	<b>373515.00</b>	<b>392191.00</b>	
12.17		C	<b>Soft Rock (11m dia well )</b>					
			<b>Unit = Running Meter.</b>					
			<b>Taking output = 0.50 m</b>					
			<b>Depth in soft rock strata upto 3m</b>					
			Rate of sinking @ 0.06 m/hour					
		a)	<b>Labour</b>					
			Mate	day	0.95	272.00	258.40	L-12
			Sinker ( skilled )	day	4.25	325.00	1381.25	L-15
			Sinking helper (semi-skilled)	day	18.00	268.00	4824.00	L-14
			Diver	day	1.50	367.00	550.50	L-07
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.00	1925.00	15400.00	P&M-075
			Air compressor with pneumatic breakers	hour	4.50	934.00	4203.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1960.30	
			Add for dewatering @ 5 per cent of cost of (b), if required				1078.17	
		c)	<b>Overhead charges @ 0.21 on (a+b)</b>				6227.68	

# Analysis of Rates **FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			d) Contractor's profit @ 0.1 on (a+b+c)				3588.33	
			Cost for 0.5m = a+b+c+d				39471.62	
			Rate per metre = (a+b+c+d)/0.50				78943.25	
						say	<b>78943.00</b>	
12.17		D	Hard Rock (11m dia well )					
			Unit = Running Meter.					
			Taking output = 0.50 m					
			Depth in hard rock upto 3 m					
			Rate of sinking @ 0.05 m/hour					
			a) Material					
			Gelatine 80 per cent	Kg	12.00	781.83	9381.96	M-104
			Electric Detonators	each.	48.00	5.73	274.97	M-094/100
			b) Labour					
			Mate	day	1.35	272.00	367.20	L-12
			Driller	day	2.00	307.00	614.00	L-06
			Blaster	day	0.25	425.00	106.25	L-03
			Mazdoor	day	26.00	257.00	6682.00	L-13
			Mazdoor (Skilled)	day	4.00	325.00	1300.00	L-15
			c) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	1925.00	19250.00	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.50	934.00	3269.00	P&M-063
			Dewatering @ 5 per cent of cost (c), if required.				1125.95	
			Consumables in sinking @ 10 per cent of cost of (b+c).				3158.85	
			d) Overhead charges @ 0.21 on (a+b+c)				9561.34	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				5509.15	
			Cost for 0.5m = a+b+c+d+e				60600.67	
			Rate per metre = (a+b+c+d+e)/0.50				121201.33	
						say	<b>121201.00</b>	
12.18	1200		Sinking of 12 m external diameter well ( other than pneumatic method of sinking ) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			Unit = Running Meter					
			Taking output = 0.25 m					
			Diameter of well - 12 m.					
		A	Sandy Soil					
		(i)	l) Depth below bed level upto 3.0 M					
			Rate of sinking @ 0.05 m/hour					
			a) Labour					
			Mate	day	0.22	272.00	59.84	L-12
			Sinker ( skilled )	day	1.75	325.00	568.75	L-15
			Sinking helper (semi-skilled)	day	4.00	268.00	1072.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1925.00	11550.00	P&M-075
			Consumables in sinking @10 per cent of (b)				1155.00	
			c) Overhead charges @ 0.21 on (a+b)				3025.17	
			d) Contractor's profit @ 0.1 on (a+b+c)				1743.08	
			Cost for 0.25m = a+b+c+d				19173.84	
			Rate per metre = (a+b+c+d)/0.25				76695.36	
						say	<b>76695.00</b>	

## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
12.18 A		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking @ 0.038 m/hour					
		a)	<b>Labour</b>					
			Mate	day	0.37	272.00	100.64	L-12
			Sinker	day	2.50	325.00	812.50	L-15
			Sinking helper (semi-skilled)	day	4.75	268.00	1273.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	1925.00	12512.50	P&M-075
			Consumables in sinking @10 per cent of (b)				1251.25	
		c)	<b>Overhead charges @ 0.21 on (a+b)</b>				3349.48	
		d)	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				1929.94	
			Cost for 0.25m = a+b+c+d				21229.30	
			<b>Rate per metre = (a+b+c+d)/0.25</b>				84917.21	
						<b>say</b>	<b>84917.00</b>	
12.18 A		(iii)	<b>Beyond 10m upto 20m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
			11th m	5%	89163.00			
			12th m	5%	93621.00			
			13th m	5%	98302.00			
			14th m	5%	103217.00			
			15th m	5%	108378.00			
			16th m	5%	113797.00			
			17th m	5%	119487.00			
			18th m	5%	125461.00			
			19th m	5%	131734.00			
			20th m	5%	138321.00			
			Total Cost from 10m upto 20m		1121481.00			
			<b>Avg Rate per metre</b>		<b>112148.00</b>			
12.18 A		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		(a)	(b)Including 20% for Kentledge		
			21st m	7.5%	148695.00	178434.00		
			22nd m	7.5%	159847.00	191816.00		
			23rd m	7.5%	171836.00	206203.00		
			24th m	7.5%	184724.00	221669.00		
			25th m	7.5%	198578.00	238294.00		
			26th m	7.5%	213471.00	256165.00		
			27th m	7.5%	229481.00	275377.00		
			28th m	7.5%	246692.00	296030.00		
			29th m	7.5%	265194.00	318233.00		
			30th m	7.5%	285084.00	342101.00		
			Total Cost from 20m upto 30m		2103602.00	2524322.00		
			<b>Avg Rate per metre</b>		<b>210360.00</b>	<b>252432.00</b>		
12.18 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.		(a)	(b)Including 20% for Kentledge		
			31st m	10%	313592.00	376310.00		
			32nd	10%	344951.00	413941.00		

Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			33rd m	10%	379446.00	455335.00		
			34th m	10%	417391.00	500869.00		
			35th m	10%	459130.00	550956.00		
			36th m	10%	505043.00	606052.00		
			37th m	10%	555547.00	666656.00		
			38th m	10%	611102.00	733322.00		
			39th m	10%	672212.00	806654.00		
			40th m	10%	739433.00	887320.00		
			Total Cost from 30m upto 40m		4997847	5997415		
			<b>Avg Rate per metre</b>		<b>499785.00</b>	<b>599742.00</b>		
12.18		B	Clayey Soil (12 m dia. Well )					
			Unit = Running Meter.					
			Taking output = 0.25 meter.					
		(i)	Depth below bed level upto 3.0 M					
			Rate of sinking @ 0.04 m/hour					
			a) Labour					
			Mate	day	0.30	272.00	81.60	L-12
			Sinker ( skilled )	day	3.00	325.00	975.00	L-15
			Sinking helper (semi-skilled)	day	4.50	268.00	1206.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.25	1925.00	12031.25	P&M-075
			Consumables in sinking @ 10 per cent of (b)				1203.13	
			c) Overhead charges @ 0.21 on (a+b)				3254.36	
			d) Contractor's profit @ 0.1 on (a+b+c)				1875.13	
			Cost for 0.25m = a+b+c+d				20626.47	
			Rate per metre = (a+b+c+d)/0.25				82505.89	
						say	<b>82506.00</b>	
12.18 B		(ii)	Beyond 3m upto 10m depth					
			Rate of sinking @ 0.03 m/hour					
			a) Labour					
			Mate	day	0.48	272.00	130.56	L-12
			Sinker	day	3.75	325.00	1218.75	L-15
			Sinking helper (semi-skilled)	day	6.00	268.00	1608.00	L-14
			b) Machinery					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.33	1925.00	16035.25	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.50	934.00	4203.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				2023.83	
			c) Overhead charges @ 0.21 on (a+b)				5296.07	
			d) Contractor's profit @ 0.1 on (a+b+c)				3051.55	
			Cost for 0.25m = a+b+c+d				33567.00	
			Rate per metre = (a+b+c+d)/0.25				134268.01	
						say	<b>134268.00</b>	
12.18 B		(iii)	Beyond 10 m upto 20 m					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add for dewatering @ 5 per cent of cost, if required.		(a)	(b)Including for dewatering @ 5% of cost, if required		
			11th m	5%	140981.00	148030.00		
			12th m	5%	148030.00	155432.00		
			13th m	5%	155432.00	163204.00		
			14th m	5%	163204.00	171364.00		

L.H.S.  
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Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			15th m	5%	171364.00	179932.00		
			16th m	5%	179932.00	188929.00		
			17th m	5%	188929.00	198375.00		
			18th m	5%	198375.00	208294.00		
			19th m	5%	208294.00	218709.00		
			20th m	5%	218709.00	229644.00		
			Total Cost from 10m upto 20m		1773250.00	1861913.00		
			<b>Avg Rate per metre</b>		<b>177325.00</b>	<b>186191.00</b>		
12.18 B		(iv)	<b>Beyond 20m upto 30 m</b>					
		a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering on the cost, if required					
		c	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).		(a)	(c)Including 25% for Kentledge	(b)Including 5% for dewatering, if required	
			21st m	7.5%	235112.00	293890.00	308585.00	
			22nd	7.5%	252745.00	315931.00	331728.00	
			23rd m	7.5%	271701.00	339626.00	356607.00	
			24th m	7.5%	292079.00	365099.00	383354.00	
			25th m	7.5%	313985.00	392481.00	412105.00	
			26th m	7.5%	337534.00	421918.00	443014.00	
			27th m	7.5%	362849.00	453561.00	476239.00	
			28th m	7.5%	390063.00	487579.00	511958.00	
			29th m	7.5%	419318.00	524148.00	550355.00	
			30th m	7.5%	450767.00	563459.00	591632.00	
			Total Cost from 20m upto 30m		3326153	4157692	4365577	
			<b>Avg Rate per metre</b>		<b>332615.00</b>	<b>415769.00</b>	<b>436558.00</b>	
12.18 B		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 5 per cent of cost for dewatering, if required					
		c	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		(a)	(c ) Including 20% for Kentledge	(b)Including 5% for dewatering, if required	
			31st m	10%	495844.00	595013.00	624764.00	
			32nd	10%	545428.00	654514.00	687240.00	
			33rd m	10%	599971.00	719965.00	755963.00	
			34th m	10%	659968.00	791962.00	831560.00	
			35th m	10%	725965.00	871158.00	914716.00	
			36th m	10%	798562.00	958274.00	1006188.00	
			37th m	10%	878418.00	1054102.00	1106807.00	
			38th m	10%	966260.00	1159512.00	1217488.00	
			39th m	10%	1062886.00	1275463.00	1339236.00	
			40th m	10%	1169175.00	1403010.00	1473161.00	
			Total Cost from 30m upto 40m		7902477	9482973	9957123	
			<b>Avg Rate per metre</b>		<b>790248.00</b>	<b>948297.00</b>	<b>995712.00</b>	
12.18		C	<b>Soft Rock (12m dia well )</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 0.25 m</b>					
			<b>Depth in soft rock strata upto 3m</b>					
			<b>Rate of sinking @ 0.025 m/hour</b>					
			<b>a) Labour</b>					
			Mate	day	1.06	272.00	288.32	L-12
			Sinker ( skilled )	day	4.50	325.00	1462.50	L-15



# Analysis of Rates

## FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Sinking helper (semi-skilled)	day	20.00	268.00	5360.00	L-14
			Diver	day	1.75	367.00	642.25	L-07
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	1925.00	19250.00	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.75	934.00	4436.50	P&M-063
			Consumables in sinking @ 10 per cent of (b)				2368.65	
			Add for dewatering @ 5 per cent, if required				1302.76	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				7373.31	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				4248.43	
			Cost for 0.25m = a+b+c+d				46732.71	
			<b>Rate per metre = (a+b+c+d)/0.25</b>				186930.84	
						<b>say</b>	<b>186931.00</b>	
12.18		D	Hard Rock (12m dia well )					
			<i>Unit = Running Meter</i>					
			<i>Taking output = 0.25 m</i>					
		(i)	Depth in hard rock strata upto 3 m					
			Rate of sinking @ 0.020 m/hour					
			<b>a) Material</b>					
			Gelatine 80 per cent	Kg	14.00	781.83	10945.62	M-104
			Electric detonator	each.	56.00	5.73	320.80	M-094/100
			<b>b) Labour</b>					
			Mate	day	1.44	272.00	391.68	L-12
			Driller	day	2.00	307.00	614.00	L-06
			Blaster	day	0.25	425.00	106.25	L-03
			Mazdoor	day	28.00	257.00	7196.00	L-13
			Mazdoor (Skilled)	day	4.50	325.00	1462.50	L-15
			<b>c) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	12.50	1925.00	24062.50	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	4.00	934.00	3736.00	P&M-063
			Dewatering @ 5 per cent, if required.				1389.93	
			Consumables in sinking @ 10 per cent of (c).				2918.84	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				11160.27	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				6430.44	
			Cost for 0.25m = a+b+c+d+e				70734.82	
			<b>Rate per metre = (a+b+c+d+e)/0.25</b>				282939.29	
						<b>say</b>	<b>282939.00</b>	
12.19	1200		Sinking of Twin D Type well (other than pneumatic method of sinking) through all types of strata namely sandy soil, clayey soil and rock as shown against each case, complete as per drawing and technical specifications. Depth of sinking is reckoned from bed level.					
			<i>Unit = Running Meter</i>					
			<i>Taking output = 1 m</i>					
			Dimensions of well.					
			Overall length = 12 m					
			Overall width = 6 m					
		A	Sandy Soil					
		(i)	Depth from bed level upto 3.0 M					
			Rate of sinking @ 0.18 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.20	272.00	54.40	L-12

*Calc.*  
*12/8/19*

# Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Sinker ( skilled )	day	1.25	325.00	406.25	L-15
			Sinking helper (semi-skilled)	day	3.75	268.00	1005.00	L-14
		<b>b)</b>	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.50	1925.00	10587.50	P&M-075
			Consumables in sinking @10 per cent of (b)				1058.75	
		<b>c)</b>	<b>Overhead charges @ 0.21 on (a+b)</b>				2753.50	
		<b>d)</b>	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				1586.54	
			<b>Rate per metre = (a+b+c+d)</b>				17451.94	
						<b>say</b>	<b>17452.00</b>	
<b>12.19 A</b>		<b>(ii)</b>	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking @ 0.17 m/hour					
		<b>a)</b>	<b>Labour</b>					
			Mate	day	0.30	272.00	81.60	L-12
			Sinker	day	1.50	325.00	487.50	L-15
			Sinking helper (semi-skilled)	day	4.00	268.00	1072.00	L-14
		<b>b)</b>	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.88	1925.00	11319.00	P&M-075
			Consumables in sinking @10 per cent of (b)				1131.90	
		<b>c)</b>	<b>Overhead charges @ 0.21 on (a+b)</b>				2959.32	
		<b>d)</b>	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				1705.13	
			<b>Rate per metre = (a+b+c+d)</b>				18756.45	
						<b>say</b>	<b>18756.00</b>	
<b>12.19 A</b>		<b>(iii)</b>	<b>Beyond 10m upto 20m</b>					
		<b>a</b>	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
			11th m	5%	19694.00			
			12th m	5%	20679.00			
			13th m	5%	21713.00			
			14th m	5%	22799.00			
			15th m	5%	23939.00			
			16th m	5%	25136.00			
			17th m	5%	26393.00			
			18th m	5%	27713.00			
			19th m	5%	29099.00			
			20th m	5%	30554.00			
			Total Cost from 10m upto 20m		247719.00			
			<b>Avg Rate per metre</b>		<b>24772.00</b>			
<b>12.19 A</b>		<b>(iv)</b>	<b>Beyond 20m upto 30 m</b>					
		<b>a</b>	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		<b>b</b>	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.			(a)	(b)Including 20% for Kentledge	
			21st m	7.5%	32846.00		39415.00	
			22nd m	7.5%	35309.00		42371.00	
			23rd m	7.5%	37957.00		45548.00	
			24th m	7.5%	40804.00		48965.00	
			25th m	7.5%	43864.00		52637.00	
			26th m	7.5%	47154.00		56585.00	
			27th m	7.5%	50691.00		60829.00	
			28th m	7.5%	54493.00		65392.00	
			29th m	7.5%	58580.00		70296.00	
			30th m	7.5%	62974.00		75569.00	
			Total Cost from 20m upto 30m		464672.00		557607.00	

# Analysis of Rates

## FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>Avg Rate per metre</b>		<b>46467.00</b>	<b>55761.00</b>		
12.19 A		(v)	<b>Beyond 30m upto 40 m</b>					
		a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		b	Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.		(a)	(b)Including 20% for Kentledge		
			31st m	10%	69271.00	83125.00		
			32nd	10%	76198.00	91438.00		
			33rd m	10%	83818.00	100582.00		
			34th m	10%	92200.00	110640.00		
			35th m	10%	101420.00	121704.00		
			36th m	10%	111562.00	133874.00		
			37th m	10%	122718.00	147262.00		
			38th m	10%	134990.00	161988.00		
			39th m	10%	148489.00	178187.00		
			40th m	10%	163338.00	196006.00		
			Total Cost from 30m upto 40m		1104004.00	1324806.00		
			<b>Avg Rate per metre</b>		<b>110400.00</b>	<b>132481.00</b>		
12.19		B	<b>Clayey Soil (Twin D Type Well )</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 1 meter</b>					
		(i)	<b>Depth below bed level upto 3.0 M</b>					
			Rate of sinking @ 0.16 m/hour					
		a)	<b>Labour</b>					
			Mate	day	0.26	272.00	70.72	L-12
			Sinker ( skilled )	day	2.50	325.00	812.50	L-15
			Sinking helper (semi-skilled)	day	4.00	268.00	1072.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.25	1925.00	12031.25	P&M-075
			Consumables in sinking @ 10 per cent of (b)				1203.13	
		c)	<b>Overhead charges @ 0.21 on (a+b)</b>				3189.81	
		d)	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				1837.94	
			<b>Rate per metre = (a+b+c+d)</b>				20217.35	
						<b>say</b>	<b>20217.00</b>	
12.19 B		(ii)	<b>Beyond 3m upto 10m depth</b>					
			Rate of sinking @ 0.15 m/hour					
		a)	<b>Labour</b>					
			Mate	day	0.45	272.00	122.40	L-12
			Sinker	day	3.25	325.00	1056.25	L-15
			Sinking helper (semi-skilled)	day	6.00	268.00	1608.00	L-14
		b)	<b>Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.67	1925.00	12839.75	P&M-075
			Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.50	934.00	4203.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				1704.28	
		c)	<b>Overhead charges @ 0.21 on (a+b)</b>				4522.07	
		d)	<b>Contractor's profit @ 0.1 on (a+b+c)</b>				2605.57	
			<b>Rate per metre = (a+b+c+d)</b>				28661.32	
						<b>say</b>	<b>28661.00</b>	
12.19 B		(iii)	<b>Beyond 10 m upto 20 m</b>					
		a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					

Calc. 12/8/19

Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>b</b>	Add for dewatering @ 5 per cent of cost, if required.		(a)	(b) Including for dewatering @ 5% of cost, if required		
			11th m	5%	30094.00	31599.00		
			12th m	5%	31599.00	33179.00		
			13th m	5%	33179.00	34838.00		
			14th m	5%	34838.00	36580.00		
			15th m	5%	36580.00	38409.00		
			16th m	5%	38409.00	40329.00		
			17th m	5%	40329.00	42345.00		
			18th m	5%	42345.00	44462.00		
			19th m	5%	44462.00	46685.00		
			20th m	5%	46685.00	49019.00		
			Total Cost from 10m upto 20m		378520.00	397445.00		
			<b>Avg Rate per metre</b>		<b>37852.00</b>	<b>39745.00</b>		
<b>12.19 B</b>		<b>(iv)</b>	<b>Beyond 20m upto 30 m</b>					
		<b>a</b>	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		<b>b</b>	Add 5 per cent of cost for dewatering on the cost, if required					
		<b>c</b>	Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour ).		(a)	(c) Including 25% for Kentledge	(b) Including 5% for dewatering, if required	
			21st m	7.5%	50186.00	62733.00	65870.00	
			22nd	7.5%	53950.00	67438.00	70810.00	
			23rd m	7.5%	57996.00	72495.00	76120.00	
			24th m	7.5%	62346.00	77933.00	81830.00	
			25th m	7.5%	67022.00	83778.00	87967.00	
			26th m	7.5%	72049.00	90061.00	94564.00	
			27th m	7.5%	77453.00	96816.00	101657.00	
			28th m	7.5%	83262.00	104078.00	109282.00	
			29th m	7.5%	89507.00	111884.00	117478.00	
			30th m	7.5%	96220.00	120275.00	126289.00	
			Total Cost from 20m upto 30m		709991.00	887491.00	931867.00	
			<b>Avg Rate per metre</b>		<b>70999.00</b>	<b>88749.00</b>	<b>93187.00</b>	
<b>12.19 B</b>		<b>(v)</b>	<b>Beyond 30m upto 40 m</b>					
		<b>a</b>	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter					
		<b>b</b>	Add 5 per cent of cost for dewatering, if required					
		<b>c</b>	Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour).		(a)	(c ) Including 20% for Kentledge	(b) Including 5% for dewatering, if required	
			31st m	10%	105842.00	127010.00	133361.00	
			32nd	10%	116426.00	139711.00	146697.00	
			33rd m	10%	128069.00	153683.00	161367.00	
			34th m	10%	140876.00	169051.00	177504.00	
			35th m	10%	154964.00	185957.00	195255.00	
			36th m	10%	170460.00	204552.00	214780.00	
			37th m	10%	187506.00	225007.00	236257.00	
			38th m	10%	206257.00	247508.00	259883.00	
			39th m	10%	226883.00	272260.00	285873.00	
			40th m	10%	249571.00	299485.00	314459.00	
			Total Cost from 30m upto 40m		1686854.00	2024224.00	2125436.00	
			<b>Avg Rate per metre</b>		<b>168685.00</b>	<b>202422.00</b>	<b>212544.00</b>	
<b>12.19</b>		<b>C</b>	<b>Soft Rock (Twin D Type Well )</b>					

Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>Unit = Running Meter</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in soft rock strata upto 3m</b>					
			Rate of sinking @ 0.12 m/hour					
			<b>a) Labour</b>					
			Mate	day	0.86	272.00	233.92	L-12
			Sinker ( skilled )	day	4.50	325.00	1462.50	L-15
			Sinking helper (semi-skilled)	day	15.00	268.00	4020.00	L-14
			Diver	day	1.50	367.00	550.50	L-07
			<b>b) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.33	1925.00	16035.25	P&M-075
			Air compressor with pneumatic breakers	hour	6.00	934.00	5604.00	P&M-063
			Consumables in sinking @ 10 per cent of (b)				2163.93	
			Add for dewatering @ 5 per cent, if required				1190.16	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				6564.65	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				3782.49	
			<b>Rate per metre = (a+b+c+d)</b>				41607.40	
						<b>say</b>	<b>41607.00</b>	
12.19		D	<b>Hard Rock (Twin D Type Well )</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 1 m</b>					
			<b>Depth in hard rock strata upto 3 m</b>					
			Rate of sinking @ 0.10 m/hour					
			<b>a) Material</b>					
			Geletine 80 per cent	Kg	10.00	781.83	7818.30	M-104
			Electric detonators	each.	40.00	5.73	229.14	M-094/100
			<b>b) Labour</b>					
			Mate	day	1.34	272.00	364.48	L-12
			Driller	day	2.00	307.00	614.00	L-06
			Blaster	day	0.25	425.00	106.25	L-03
			Mazdoor	day	25.00	257.00	6425.00	L-13
			Mazdoor (Skilled)	day	4.25	325.00	1381.25	L-15
			<b>c) Machinery</b>					
			Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	1925.00	19250.00	P&M-075
			Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.00	934.00	2802.00	P&M-063
			Dewatering @ 5 per cent of cost of (b+c), if required.				1547.15	
			Consumables in sinking @ 10 per cent of (c).				2359.91	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				9008.47	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				5190.60	
			<b>Rate per metre = (a+b+c+d+e)</b>				57096.56	
						<b>say</b>	<b>57097.00</b>	

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Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
12.20	1200		Pneumatic sinking of wells with equipment of approved design, drawing and specifications worked by competent and trained personnel and comprising of compression and decompression chambers, reducers, two air locks separately for men and plant & materials, arrangement for supply of fresh air to working chambers, check valves, exhaust valves, shafts made from steel plates of riveted construction not less than 6 mm thick to withstand an air pressure of 0.50 MPa, controlled blasting of hard rock where required, staircases and 1 m wide landing platforms with railing, arrangement for compression and decompression, electric lighting of 50 V maximum, proper rooms for rest and medical examinations and compliance with safety precautions as per IS:4138, all as per clause 1207.6 of MoRTH Specifications.					
			<b>Unit - 1 cum</b>					
			<b>Taking output = 5 cum</b>					
			<b>a) Material</b>					
			M35 grade RCC corbel provided for supporting of equipment (Dimensions as per ground conditions). Rate may be adopted vide Item 12.8 (H)	Cum	8.00	4565.00	36520.00	Item 12.8 (H)
			HYSD bar reinforcement in corbel	tonne	0.48	42532.00	20415.36	M-082
			<b>Blasting material</b>					
			Gelatine 80 per cent	Kg	1.50	781.83	1172.75	M-104
			Electric detonators	each	6.00	5.73	34.37	M-094/100
			<b>b) Labour</b>					
			Medical Officer	day	0.50	958.00	479.00	L-16
			Para medical personnel	day	1.00	471.00	471.00	L-19
			Mate	day	1.86	272.00	505.92	L-12
			Driller	day	1.00	307.00	307.00	L-06
			Blaster	day	0.50	425.00	212.50	L-03
			Mazdoor (for cutting, blasting, cleaning, removal of Material etc.)	day	30.00	257.00	7710.00	L-13
			Mazdoor (Skilled) (for fixation and removal of adopter for air lock, carrying out mechanical and electrical operations and repairs and other skilled jobs.)	day	10.00	325.00	3250.00	L-15
			Diver	day	4.00	367.00	1468.00	L-07
			<b>c) Machinery</b>					
			<b>(i) Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking.</b>	hour	6.00	input	#VALUE!	P&M-082
			Induction and deinduction	L.S			100000.00	
			Erection at site and commissioning	L.S			150000.00	
			Usage of plant and equipment for pneumatic method of well sinking	hour	6.00	6273.00	37638.00	P&M-038
			Air compressor 250 cfm, 2 nos.	hour	2 x 6	481.00	5772.00	P&M-001
			Hire and running charges of crane of 15 tonne capacity	hour	6.00	1282.00	7692.00	P&M-072
			Motorised barge of 20 tonne capacity	hour	6.00	234.00	1404.00	P&M-066
			Boat to carry atleast 20 persons	hour	6.00	234.00	1404.00	P&M-066
			Electric generating set 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			Tipper 10 tonne capacity	hour	6.00	1018.00	6108.00	P&M-048
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				#VALUE!	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				#VALUE!	
			Cost for 5 cum = a+b+c+d+e (see notes below)				#VALUE!	
			<b>Rate per cum = (a+b+c+d+e)/5</b>				#VALUE!	

## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Note</b>	1.The cost of induction, deinduction and erection of equipment shall be divided by the total quantity of pneumatic sinking for all the wells of a particular bridge to arrive at the per cum rate on account of this item.					
			2.Cost of pneumatic sinking per cum of individual wells will be added to the cost indicated at (1) above to arrive at the final rate of pneumatic sinking per cum.					
			3.The cost of induction and deinduction will depend upon the distance involved for shifting of equipment which may be assessed in individual cases as per actual ground conditions at the time of making of cost estimates.					
			4.In case pneumatic sinking is involved on a dry bed, the provision of barge and boat may be omitted.					
			5.The necessity and dimensions of the corbel will be as per actual ground conditions.					
			6.Small equipments like welding sets, pumps, vibrators, pneumatic tools, portable lamps, fire extinguishers, hose pipes etc., have not been included as the same are covered as items of minor T&P under overhead charges.					
			7.Depth of sinking shall be restricted to 30 m.					
12.21	1207		<b>Sand Filling in Wells complete as per Drawing and Technical Specifications.</b>					
			<b>Unit = 1 cum</b>					
			<b>Taking output = 1 cum</b>					
			<b>a) Material</b>					
			Sand (assuming 20 per cent voids )	cum	1.20	116.85	140.22	M-006
			<b>b) Labour</b>					
			Mate	day	0.01	272.00	2.72	L-12
			Mazdoor	day	0.30	257.00	77.10	L-13
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				46.21	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				26.62	
			<b>Rate per cum (a+b+c+d)</b>				292.87	
						<b>say</b>	<b>293.00</b>	
12.22	1200 & 1900		<b>Providing Steel Liner 10 mm thick for Curbs and 6 mm thick for Steining of Wells including Fabricating and Setting out as per Detailed Drawing.</b>					
			<b>Unit = 1 MT</b>					
			<b>Taking output = 1 MT</b>					
			<b>a) Material</b>					
			i) Structural steel including 5 per cent wastage	tonne	1.05	44927.00	47173.35	M-179
			<b>b) Labour</b>					
			Mate	day	1.24	272.00	337.28	L-12
			Fitter	day	6.00	351.00	2106.00	L-08
			Blacksmith	day	5.00	307.00	1535.00	L-01
			Welder	day	5.00	386.00	1930.00	L-02b
			Mazdoor	day	10.00	257.00	2570.00	L-13
			Electrodes, cutting gas and other consumables @ 5 per cent on cost a (a) above.				2358.67	
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				12182.16	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				7019.25	
			<b>Rate for per MT (a+b+c+d)</b>				77211.71	
						<b>say</b>	<b>77212.00</b>	
12.23	1100 & 1700		<b>Bored cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m.</b>					
			<b>Pile diameter-750 mm</b>					
			<b>Unit = meter</b>					

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# Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>Taking output = 15 m</b>					
			<b>a) Materials</b>					
	added	Case I	PCC Grade M35 (with using Concrete Mixer)	cum	6.62	5282.00	34966.84	Item 12.11 (C) iv case-I
		Case II	PCC Grade M35 (With using Batching Plant)	cum	6.62	4932.00	32649.84	Item 12.11 (C) iv case II
			Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( C ) (IV)					
			Concrete to be cast with a tremie pipe 200mm dia.					
			<b>b) Machinery( for boring and construction )</b>					
			Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.	hour	6.00	8220.00	49320.00	P&M-036
			Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	537.00	268.50	P&M-013
			Hire and running charges of Bentonite pump	hour	6.00	Rate included in piling rig		
			Loader I cum bucket capacity.	hour	0.30	1373.00	411.90	P&M-017
			Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.30	1018.00	305.40	P&M-048
			Bentonite	kg	300.00	3.55	1065.00	M-071
			<b>c) Labour</b>					
			Mate/Supervisor	day	0.14	272.00	38.08	L-12
			Mazdoor	day	3.50	257.00	899.50	L-13
			<b>d) Overhead charges @ 0.21 on (b+c)</b>				10984.76	
			<b>e) Contractor's profit @ 0.1 on (b+c+d)</b>				6329.31	
			Cost for 15 m = a+b+c+d+e				102272.29	
			<b>Rate per metre (a+b+c+d+e)/15</b>				6818.15	
						<b>say</b>	<b>6818.00</b>	
			<b>A) Rate with using Concrete Mixer</b>				<b>6972.00</b>	
			<b>B) Rate with using Batching Plant</b>				<b>6818.00</b>	
12.24	1100,160 0 & 1700		<b>Bored cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m.</b>					
			<b>Pile diameter-1000 mm</b>					
			<b>Unit = meter</b>					
			<b>Taking output = 10 m</b>					
			<b>a) Materials</b>					
	added	Case I	PCC Grade M35 (with using Concrete Mixer)	cum	7.85	5282.00	41463.70	Item 12.11 (C) iv case-I
		Case II	PCC Grade M35 (With using Batching Plant)	cum	7.85	4932.00	38716.20	Item 12.11 (C) iv case II
			Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( C ) (IV)					
			Concrete to be cast with a tremie pipe 200mm dia.					
			<b>b) Machinery( for boring and construction )</b>					
			Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.	hour	6.00	8220.00	49320.00	P&M-036
			Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	537.00	268.50	P&M-013
			Hire and running charges of Bentonite pump	hour	6.00	Rate included in piling rig		
			Loader I cum bucket capacity.	hour	0.40	1373.00	549.20	P&M-017
			Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.40	1018.00	407.20	P&M-048
			Bentonite	kg	350.00	3.55	1242.50	M-071
			<b>c) Labour</b>					
			Mate/Supervisor	day	0.16	272.00	43.52	L-12



Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Mazdoor	day	4.00	257.00	1028.00	L-13
			d) Overhead charges @ 0.21 on (b+c)				11100.37	
			e) Contractor's profit @ 0.1 on (b+c+d)				6395.93	
			Cost for 10 m = a+b+c+d+d+e				109071.42	
			Rate per metre (a+b+c+d+e)/10				10907.14	
						say	<b>10907.00</b>	
			A) Rate with using Concrete Mixer				<b>11182.00</b>	
			B) Rate with using Batching Plant				<b>10907.00</b>	
12.25	1100 & 1700		Bored cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and Technical Specifications and removal of excavated earth with all lifts and lead upto 1000 m.					
			Pile diameter-1200 mm					
			Unit = meter					
			Taking output = 9 m					
			a) Materials					
	added	Case I	PCC Grade M35 (with using Concrete Mixer)	cum	10.17	5282.00	53717.94	Item 12.11 (C) iv case-I
		Case II	PCC Grade M35 (With using Batching Plant)	cum	10.17	4932.00	50158.44	Item 12.11 (C) iv case II
			Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( C ) (IV)					
			Concrete to be cast with a tremie pipe 200mm dia.					
			b) Machinery( for boring and construction )					
			Hire and running charges of hydraulic piling rig with power unit and complete accessories including shifting from one bore location to another.	hour	6.00	8220.00	49320.00	P&M-036
			Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	537.00	268.50	P&M-013
			Hire and running charges of Bentonite pump	hour	6.00	Rate included in piling rig		
			Loader I cum bucket capacity.	hour	0.50	1373.00	686.50	P&M-017
			Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.50	1018.00	509.00	P&M-048
			Bentonite	kg	385.00	3.55	1366.75	M-071
			c) Labour					
			Mate/Supervisor	day	0.18	272.00	48.96	L-12
			Mazdoor	day	4.50	257.00	1156.50	L-13
			d) Overhead charges @ 0.21 on (b+c)				11204.80	
			e) Contractor's profit @ 0.1 on (b+c+d)				6456.10	
			Cost for 9 m = a+b+c+d+d+e				121175.56	
			Rate per metre (a+b+c+d+e)/9				13463.95	
						say	<b>13464.00</b>	
			A) Rate with using Concrete Mixer				<b>13860.00</b>	
			B) Rate with using Batching Plant				<b>13464.00</b>	
12.26	1100 & 1700		Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification					
			Pile diameter - 750 mm					
			Unit = Running meter					
			Taking output = 40 metre					
			a) Materials					
	added	Case I	PCC Grade M35 (with using Concrete Mixer)	cum	17.66	5282.00	93280.12	Item 12.11 (C) iv case-I
		Case II	PCC Grade M35 (With using Batching Plant)	cum	17.66	4932.00	87099.12	Item 12.11 (C) iv case II
			Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( C ) (IV)					

## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>b) Materials Pile shoes</b>					
			i) C.I. shoes for the pile	Kg	160.00	43.17	6907.20	M-080
			ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	65.11	4557.70	M-124
			iii) Steel helmet and cushion block on top of casing head during driving	Kg	50.00	38.06	1903.00	M-173
			<b>c) Machinery</b>					
			Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories..	hour	6.00	8220.00	49320.00	P&M-085
			Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	1282.00	641.00	P&M-070
			<b>d) Labour</b>					
			Mate/Supervisor	day	0.12	272.00	32.64	L-12
			Mazdoor	day	3.00	257.00	771.00	L-13
			<b>e) Overhead charges @ 0.21 on (b+c+d)</b>				13467.83	
			<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				7760.04	
			Cost for 40 m = a+b+c+d+e				172459.53	
			<b>Rate per metre (a+b+c+d+e)/40</b>				4311.49	
						<b>say</b>	<b>4311.00</b>	
			<b>A) Rate with using Concrete Mixer</b>				<b>4466.00</b>	
			<b>B) Rate with using Batching Plant</b>				<b>4311.00</b>	
		<b>Note</b>	1.The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
			2.In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 per cent of cost of concrete may be provided to cover its usage.					
12.27	1100 & 1700		<b>Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and &amp; Technical Specification</b>					
			<b>Pile diameter - 1000 mm</b>					
			<b>Unit = Running meter</b>					
			<b>Taking output = 30 metre</b>					
			<b>a) Materials</b>					
	added	<b>Case I</b>	PCC Grade M35 (with using Concrete Mixer)	cum	23.55	5282.00	124391.10	Item 12.11 (C) iv case-I
		<b>Case II</b>	PCC Grade M35 (With using Batching Plant)	cum	23.55	4932.00	116148.60	Item 12.11 (C) iv case II
			<b>Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( C ) (IV)</b>					
			<b>b) Materials Pile shoes</b>					
			i) C.I. shoes for the pile	Kg	160.00	43.17	6907.20	M-080
			ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	65.11	4557.70	M-124
			iii) Steel helmet and cushion block on top of casing head during driving	Kg	50.00	38.06	1903.00	M-173
			<b>c) Machinery</b>					
			Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories.	hour	6.00	8220.00	49320.00	P&M-085
			Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	1282.00	641.00	P&M-070
			Hire and running charges for light crane for lowering reinforcement cage.	hour	0.50	537.00	268.50	P&M-013
			<b>d) Labour</b>					
			Mate/Supervisor	day	0.16	272.00	43.52	L-12

## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Mazdoor	day	4.00	257.00	1028.00	L-13
			e) Overhead charges @ 0.21 on (b+c+d)				13580.47	
			f) Contractor's profit @ 0.1 on (b+c+d+e)				7824.94	
			Cost for 30 m = a+b+c+d+e				202222.93	
			Rate per metre (a+b+c+d+e)/30				6740.76	
						say	<b>6741.00</b>	
			A) Rate with using Concrete Mixer				<b>7016.00</b>	
			B) Rate with using Batching Plant				<b>6741.00</b>	
		Note	1.The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
			2.In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 per cent of cost of concrete may be provided to cover its usage.					
12.28	1100 & 1700		Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification					
			Pile diameter - 1200 mm					
			Unit = Running meter					
			Taking output = 20 metre					
			a) Materials					
	added	Case I	PCC Grade M35 (with using Concrete Mixer)	cum	22.61	5282.00	119426.02	Item 12.11 (C) iv case-I
		Case II	PCC Grade M35 (With using Batching Plant)	cum	22.61	4932.00	111512.52	Item 12.11 (C) iv case II
			Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( C ) (IV)					
			b) Materials Pile shoes					
			i) C.I. shoes for the pile	Kg	160.00	43.17	6907.20	M-080
			ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	65.11	4557.70	M-124
			iii) Steel helmet on top of casing head during driving	Kg	50.00	38.06	1903.00	M-173
			c) Machinery					
			Hire and running charges of piling rig Including double acting pile driving hammer complete with power unit and accessories.	hour	6.00	8220.00	49320.00	P&M-085
			Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	1282.00	641.00	P&M-070
			d) Labour					
			Mate/Supervisor	day	0.18	272.00	48.96	L-12
			Mazdoor	day	4.50	257.00	1156.50	L-13
			e) Overhead charges @ 0.21 on (b+c+d)				13552.22	
			f) Contractor's profit @ 0.1 on (b+c+d+e)				7808.66	
			Cost for 20 m = a+b+c+d+e				197407.75	
			Rate per metre (a+b+c+d+e)/20				9870.39	
						say	<b>9870.00</b>	
			A) Rate with using Concrete Mixer				<b>10266.00</b>	
			B) Rate with using Batching Plant				<b>9870.00</b>	
		Note	1.The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					

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## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			2. In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50 per cent of cost of concrete may be provided to cover its usage.					
12.29	1100 & 1700		<b>Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and &amp; Technical Specification</b>					
			<b>Pile Diameter = 500 mm</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 60 m</b>					
			<b>a) Materials</b>					
			RCC Grade M35	cum	11.78	4565.00	53775.70	Item 12.11 (F) iv
			Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( F ) (IV)					
			<b>b ) Material Pile shoes</b>					
			a) C.I Shoes	Kg	240.00	43.17	10360.80	M-080
			b) M.S. shoes	Kg	105.00	24.90	2614.50	M-125
			c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	38.06	1141.80	M-173
			<b>c) Machinery</b>					
			Crane 20 t capacity	hour	6.00	1282.00	7692.00	P&M-073
			Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
			<b>d) Labour</b>					
			Mate/Supervisor	day	0.12	272.00	32.64	L-12
			Mazdoor	day	3.00	257.00	771.00	L-13
			Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				#VALUE!	
			<b>e) Overhead charges @ 0.21 on (b+c+d)</b>				#VALUE!	
			<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				#VALUE!	
			Cost for 60 m = a+b+c+d+e+f				#VALUE!	
			<b>Rate per metre (a+b+c+d+e+f)/60</b>				#VALUE!	
						<b>say</b>	<b>#VALUE!</b>	
		<b>Note</b>	The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.30	1100 & 1700		<b>Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and &amp; Technical Specification</b>					
			<b>Pile Diameter = 750 mm</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 50 m</b>					
			<b>a) Materials</b>					
			RCC Grade M35	cum	22.08	4565.00	100795.20	Item 12.11 (F) iv
			Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( F ) (IV)					
			<b>b ) Material Pile shoes</b>					
			a) C.I. shoes	Kg	160.00	43.17	6907.20	M-080
			b) M.S. shoes	Kg	70.00	24.90	1743.00	M-125
			c) Steel helmet and cushion block on top of pile head during driving.	Kg	40.00	38.06	1522.40	M-173
			<b>c) Machinery</b>					
			Crane 40 T capacity	hour	6.00	1925.00	11550.00	P&M-074
			Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092

## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>d) Labour</b>					
			Mate/Supervisor	day	0.16	272.00	43.52	L-12
			Mazdoor	day	4.00	257.00	1028.00	L-13
			Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				#VALUE!	
			<b>e) Overhead charges @ 0.21 on (b+c+d)</b>				#VALUE!	
			<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				#VALUE!	
			Cost for 50 m = a+b+c+d+e+f				#VALUE!	
			<b>Rate per metre (a+b+c+d+e+f)/50</b>				#VALUE!	
						<b>say</b>	<b>#VALUE!</b>	
		<b>Note</b>	The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.31	1100 & 1700		<b>Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and &amp; Technical Specification</b>					
			<b>Pile Diameter = 1000 mm</b>					
			<b>Unit = Running Meter</b>					
			<b>a) Materials</b>					
			RCC Grade M35	cum	31.40	4565.00	143341.00	Item 12.11 (F) iv
			Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( F ) (IV)					
			<b>b ) Material Pile shoes</b>					
			a) C.I. shoes for the pile	Kg	160.00	43.17	6907.20	M-080
			b) M.S. shoes @ 35 Kg per pile of 15 m	Kg	70.00	24.90	1743.00	M-125
			c) Steel helmet and cushion block on top of pile head during driving.	Kg	50.00	38.06	1903.00	M-173
			<b>c) Machinery</b>					
			Crane 80 t capacity.	hour	6.00	1925.00	11550.00	P&M-011
			Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
			<b>d) Labour</b>					
			Mate/Supervisor	day	0.20	272.00	54.40	L-12
			Mazdoor	day	5.00	257.00	1285.00	L-13
			Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				#VALUE!	
			<b>e) Overhead charges @ 0.21 on (b+c+d)</b>				#VALUE!	
			<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				#VALUE!	
			Cost for 40 m = a+b+c+d+e+f				#VALUE!	
			<b>Rate per metre (a+b+c+d+e+f)/40</b>				#VALUE!	
						<b>say</b>	<b>#VALUE!</b>	
		<b>Note</b>	The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.32	1100&1700		<b>Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and &amp; Technical Specification</b>					
			<b>Size of pile - 300 mm x 300 mm</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 60 m</b>					
			<b>a) Materials</b>					
			RCC Grade M-35	cum	5.40	4565.00	24651.00	Item 12.11 (F) iv
			Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( F ) (IV)					

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# Analysis of Rates

## FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			<b>b ) Material Pile shoes</b>					
			a) C I shoes	kg	240.00	43.17	10360.80	M-080
			b) M. S shoes	kg	105.00	24.90	2614.50	M-125
			c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	38.06	1141.80	M-173
			<b>c) Machinery</b>					
			Crane 10 tonne capacity	hour	6.00	1282.00	7692.00	P&M-071
			Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
			<b>d ) Labour</b>					
			Mate/Supervisor	day	0.12	272.00	32.64	L-12
			Mazdoor	day	3.00	257.00	771.00	L-13
			Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				#VALUE!	
			<b>e) Overhead charges @ 0.21 on (b+c+d)</b>				#VALUE!	
			<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				#VALUE!	
			Cost for 60 m = a+b+c+d+e+f				#VALUE!	
			<b>Rate per metre (a+b+c+d+e+f)/60</b>				#VALUE!	
						<b>say</b>	<b>#VALUE!</b>	
		<b>Note</b>	The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.33	1100 &1700		<b>Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and &amp; Technical Specification</b>					
			<b>Size of pile - 500 mm x 500 mm</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 50 m</b>					
			<b>a) Materials</b>					
			RCC Grade M-35					
			Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( F ) ( IV)	cum	12.50	4565.00	57062.50	Item 12.11 (F) iv
			<b>b ) Material Pile shoes</b>					
			a) C I shoes	kg	160.00	43.17	6907.20	M-080
			b) M. S shoes	kg	70.00	24.90	1743.00	M-125
			c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	38.06	1141.80	M-173
			<b>c) Machinery</b>					
			Crane 20 tonne capacity	hour	6.00	1282.00	7692.00	P&M-073
			Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
			<b>d ) Labour</b>					
			Mate/Supervisor	day	0.16	272.00	43.52	L-12
			Mazdoor	day	4.00	257.00	1028.00	L-13
			Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				#VALUE!	
			<b>e) Overhead charges @ 0.21 on (b+c+d)</b>				#VALUE!	
			<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				#VALUE!	
			Cost for 50 m = a+b+c+d+e+f				#VALUE!	
			<b>Rate per metre (a+b+c+d+e+f)/50</b>				#VALUE!	
						<b>say</b>	<b>#VALUE!</b>	
		<b>Note</b>	The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					

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# Analysis of Rates **FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
12.34	1100 &1700		<b>Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and &amp; Technical Specification</b>					
			<b>Size of pile - 750 mm x 750 mm</b>					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 40 m</b>					
			<b>a) Materials</b>					
			RCC Grade M-35					
			Rate for concrete may be adopted same as for bottom plug vide item no. 13.11( F ) (IV)	cum	22.50	4565.00	102712.50	Item 12.11 (F) iv
			<b>b ) Material</b>					
			Pile shoes					
			a) C I shoes	kg	160.00	43.17	6907.20	M-080
			b) M. S shoes	kg	70.00	24.90	1743.00	M-125
			c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	38.06	1141.80	M-173
			<b>c) Machinery</b>					
			Crane 20 tonne capacity	hour	6.00	1282.00	7692.00	P&M-073
			Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
			<b>d ) Labour</b>					
			Mate/Supervisor	day	0.18	272.00	48.96	L-12
			Mazdoor	day	4.50	257.00	1156.50	L-13
			Add 1 per cent of (a+b+c) for carriage of piles from casting yard to work site and stacking, and other imponderables during installation.				#VALUE!	
			<b>e) Overhead charges @ 0.21 on (b+c+d)</b>				#VALUE!	
			<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				#VALUE!	
			Cost for 40 m = a+b+c+d+e+f				#VALUE!	
			<b>Rate per metre (a+b+c+d+e+f)/40</b>				#VALUE!	
						<b>say</b>	<b>#VALUE!</b>	
		<b>Note</b>	The quantity of concrete required to be removed above the designed top level of concrete, if any, will be provided for in the rate analysis.					
12.35	1100, 1900		<b>Driven Vertical Steel Piles complete as per Drawing and &amp; Technical Specification</b>					
			Section of the pile - H Section steel column 400 x 250 mm (ISHB Series)					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 70 m</b>					
			<b>a) Materials</b>					
			Structural steel including 5 per cent wastage @ 82.20 kg/m	tonnes	6.04	44927.00	271359.08	M-179
			<b>b) Machinery</b>					
			Crane 10 T capacity	hour	6.00	1282.00	7692.00	P&M-071
			Vibrating Pile driving hammer complete with power unit and other accessories.	hour	6.00	input	#VALUE!	P&M-092
			<b>c) Labour</b>					
			Mate/Supervisor	day	0.12	272.00	32.64	L-12
			Mazdoor	day	3.00	257.00	771.00	L-13
			Add 0.5 per cent of (a+b+c) for providing steel helmet on top of pile head during driving, stacking of piles at site, providing anti-corrosion treatment and other imponderables during installation.				#VALUE!	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				#VALUE!	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				#VALUE!	
			Cost for 70 m = a+b+c+d+e				#VALUE!	
			<b>Rate per metre (a+b+c+d+e)/70</b>				#VALUE!	

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## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
						<b>say</b>	<b>#VALUE!</b>	
12.36	1100 &1900		<b>Driven Vertical Steel Piles complete as per Drawing and &amp; Technical Specification</b>					
			Section of the pile - H Section steel column 450 x 250 mm (ISHB Series)					
			<b>Unit = Running Meter</b>					
			<b>Taking output = 60 m</b>					
			<b>a) Materials</b>					
			Structural steel including 5 per cent wastage @92.50 kg/m	tonnes	5.83	44927.00	261924.41	M-179
			<b>b) Machinery</b>					
			Crane 10 T capacity	hour	6.00	1282.00	7692.00	P&M-071
			Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
			<b>c) Labour</b>					
			Mate/Supervisor	day	0.14	272.00	38.08	L-12
			Mazdoor	day	3.50	257.00	899.50	L-13
			Add 0.5 per cent of (a+b+c) for providing steel helmet and cushion block on top of pile head during driving, stacking of piles at site, providing anti-corrosive treatment and other imponderables during installation.				#VALUE!	
			<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				#VALUE!	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				#VALUE!	
			Cost for 60 m = a+b+c+d+e				#VALUE!	
			<b>Rate per metre (a+b+c+d+e)/60</b>				#VALUE!	
						<b>say</b>	<b>#VALUE!</b>	
12.37	1100		<b>Pile Load Test on single Vertical Pile in accordance with IS:2911(Part-IV)</b>					
			<b>Unit = 1 MT</b>					
			<b>Taking output = 1 MT</b>					
			a) Initial and routine load test	tonne	1.00	300.00		
			b) Lateral load test	tonne	1.00	5000.00		
		<b>Note</b>	Although, this item is incidental to work and is not required to be included in BOQ of contract, the same is required to be added in the estimate to assess cost of work.				<b>VALUE</b>	
12.38	1100, 1500 &1700		<b>Cement Concrete for Reinforced Concrete in Pile Cap complete as per Drawing and Technical Specification</b>					
		<b>A</b>	<b>RCC Grade M20</b>					
			<b>Unit = cum</b>					
			<b>Taking output = 15 cum</b>					
		<b>(i)</b>	<b>Using Concrete Mixer</b>					
			<b>a) Material</b>					
			Cement	tonne	5.12	5156.00	26398.72	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			<b>b) Labour</b>					
			Mate	day	0.90	272.00	244.80	L-12
			Mason	day	1.50	307.00	460.50	L-10
			Mazdoor for concreting	day	20.00	257.00	5140.00	L-13
			Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	257.00	257.00	L-13
			<b>c) Machinery</b>					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator (capacity 33 KVA)	hour	6.00	559.00	3354.00	P&M-079



## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1805.80	
			d) Overhead charges @ 0.21 on (a+b+c)				9859.69	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				5681.06	
			Cost for 15 cum = a+b+c+d+e				62491.69	
			Rate per metre (a+b+c+d+e)/15				4166.11	
						say	<b>4166.00</b>	
12.38A		(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
			a) Material					
			Cement	tonne	5.12	5156.00	26398.72	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-004
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			b) Labour					
			Mate	day	0.16	272.00	43.52	L-12
			Mason	day	0.38	307.00	116.66	L-10
			Mazdoor for concreting	day	2.50	257.00	642.50	L-13
			Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	257.00	257.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	0.75	2851.00	2138.25	P&M-002
			Generator 100 KVA	hour	0.75	1923.00	1442.25	P&M-080
			Loader (capacity 1 cum)	hour	0.75	1373.00	1029.75	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Lead upto 1 Km	hour	2.00	1398.00	2796.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	6.94	260.25	Lead =1 km & P&M-050
			Concrete Pump	hour	0.75	385.00	288.75	P&M-007
			Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1768.40	
			d) Overhead charges @ 0.21 on (a+b+c)				9655.45	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				5563.38	
			Cost for 15 cum = a+b+c+d+e				61197.19	
			Rate per metre (a+b+c+d+e)/15				4079.81	
						say	<b>4080.00</b>	
		Note	The value of a, b and c may be taken as applicable i.e. either using concrete mixer or batching plant.					
12.38		B	RCC Grade M25					
			Unit = cum					
			Taking output = 15 cum					
		(i)	Using Concrete Mixer					
			a) Material					
			Cement	tonne	5.99	5156.00	30884.44	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			b) Labour					
			Mate	day	0.90	272.00	244.80	L-12
			Mason	day	1.50	307.00	460.50	L-10
			Mazdoor for concreting	day	20.00	257.00	5140.00	L-13
			Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	257.00	257.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator (capacity 33 KVA)	hour	6.00	559.00	3354.00	P&M-079

Calc.  
12/8/19

## Analysis of Rates FOUNDATION

Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1985.23	
		d) Overhead charges @ 0.21 on (a+b+c)				10839.38	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6245.55	
		Cost for 15 cum = a+b+c+d+e				68701.00	
		Rate per metre (a+b+c+d+e)/15				4580.07	
					say	<b>4580.00</b>	
12.38B	(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
		a) Material					
		Cement	tonne	5.99	5156.00	30884.44	M-081
		Coarse sand	cum	6.75	150.80	1017.90	M-004
		20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
		10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
		b) Labour					
		Mate	day	0.16	272.00	43.52	L-12
		Mason	day	0.38	307.00	116.66	L-10
		Mazdoor for concreting	day	2.50	257.00	642.50	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	257.00	257.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	0.75	2851.00	2138.25	P&M-002
		Generator 125 KVA	hour	0.75	2637.00	1977.75	P&M-018
		Loader (capacity 1 cum)	hour	0.75	1373.00	1029.75	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Lead upto 1 Km	hour	2.00	1398.00	2796.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	6.94	260.25	Lead =1 km & P&M-050
		Concrete Pump	hour	0.75	385.00	288.75	P&M-007
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1969.25	
		d) Overhead charges @ 0.21 on (a+b+c)				10752.09	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6195.25	
		Cost for 15 cum = a+b+c+d+e				68147.76	
		Rate per metre (a+b+c+d+e)/15				4543.18	
					say	<b>4543.00</b>	
	Note	The value of a, b and c may be taken as applicable i.e. either using concrete mixer or batching plant.					
12.38	C	RCC Grade M30					
		Unit = cum					
		Taking output = 15 cum					
	(i)	Using Concrete Mixer					
		a) Material					
		Cement	tonne	6.10	5156.00	31451.60	M-081
		Coarse sand	cum	6.75	150.80	1017.90	M-005
		20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
		10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
		b) Labour					
		Mate	day	0.90	272.00	244.80	L-12
		Mason	day	1.50	307.00	460.50	L-10
		Mazdoor for concreting	day	20.00	257.00	5140.00	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	257.00	257.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
		Generator (capacity 33 KVA)	hour	6.00	559.00	3354.00	P&M-079

## Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				2007.92	
			d) Overhead charges @ 0.21 on (a+b+c)				10963.24	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				6316.92	
			Cost for 15 cum = a+b+c+d+e				69486.08	
			Rate per metre (a+b+c+d+e)/15				4632.41	
						say	<b>4632.00</b>	
12.38C		(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
			a) Material					
			Cement	tonne	6.10	5156.00	31451.60	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-004
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			b) Labour					
			Mate	day	0.16	272.00	43.52	L-12
			Mason	day	0.38	307.00	116.66	L-10
			Mazdoor for concreting	day	2.50	257.00	642.50	L-13
			Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	257.00	257.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	0.75	2851.00	2138.25	P&M-002
			Generator 100 KVA	hour	0.75	1923.00	1442.25	P&M-080
			Loader (capacity 1 cum)	hour	0.75	1373.00	1029.75	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Lead upto 1 Km	hour	2.00	1398.00	2796.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	6.94	260.25	Lead =1 km & P&M-050
			Concrete Pump	hour	0.75	385.00	288.75	P&M-007
			Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1970.51	
			d) Overhead charges @ 0.21 on (a+b+c)				10759.00	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				6199.23	
			Cost for 15 cum = a+b+c+d+e				68191.58	
			Rate per metre (a+b+c+d+e)/15				4546.11	
						say	<b>4546.00</b>	
		Note	The value of a, b and c may be taken as applicable i.e. either using concrete mixer or batching plant.					
12.38		D	RCC Grade M35					
			Unit = cum					
			Taking output = 15 cum					
		(i)	Using Concrete Mixer					
			a) Material					
			Cement	tonne	6.33	5156.00	32637.48	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			b) Labour					
			Mate	day	0.90	272.00	244.80	L-12
			Mason	day	1.50	307.00	460.50	L-10
			Mazdoor	day	20.00	257.00	5140.00	L-13
			Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	257.00	257.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator (capacity 33 KVA)	hour	6.00	559.00	3354.00	P&M-079

Calc.  
12/8/19

# Analysis of Rates FOUNDATION

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				2055.36	
			d) Overhead charges @ 0.21 on (a+b+c)				11222.24	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				6466.15	
			Cost for 15 cum = a+b+c+d+e				71127.63	
			Rate per metre (a+b+c+d+e)/15				4741.84	
						say	<b>4742.00</b>	
12.38D		(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
			a) Material					
			Cement	tonne	6.33	5156.00	32637.48	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-004
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			b) Labour					
			Mate	day	0.16	272.00	43.52	L-12
			Mason	day	0.38	307.00	116.66	L-10
			Mazdoor for concreting	day	2.50	257.00	642.50	L-13
			Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	257.00	257.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	0.75	2851.00	2138.25	P&M-002
			Generator 125 KVA	hour	0.75	2637.00	1977.75	P&M-018
			Loader (capacity 1 cum)	hour	0.75	1373.00	1029.75	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Lead upto 1 Km	hour	2.00	1398.00	2796.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	6.94	260.25	Lead =1 km & P&M-050
			Concrete Pump	hour	0.75	385.00	288.75	P&M-007
			Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				2039.37	
			d) Overhead charges @ 0.21 on (a+b+c)				11134.95	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				6415.85	
			Cost for 15 cum = a+b+c+d+e				70574.39	
			Rate per metre (a+b+c+d+e)/15				4704.96	
						say	<b>4705.00</b>	
12.39	1100&17 00		Levelling Course for Pile cap					
			Providing and laying of PCC M15 levelling course 100mm thick below the pile cap.					
			Unit = cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	4.13	5156.00	21294.28	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			40 mm aggregate	cum	8.10	441.08	3572.75	M-055
			20 mm Aggregate	cum	4.05	550.85	2230.94	M-053
			10 mm Aggregate	cum	1.35	614.17	829.13	M-051
			b) Labour					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	307.00	460.50	L-10
			Mazdoor	day	20.00	257.00	5140.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			d) Overhead charges @ 0.21 on (a+b+c)				8111.72	

Analysis of Rates  
**FOUNDATION**

	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			e) Contractor's profit @ 0.1 on (a+b+c+d)				4673.89	
			Cost for 15 cum = a+b+c+d+e				51412.83	
			Rate per metre (a+b+c+d+e)/15				3427.52	
						say	<b>3428.00</b>	
12.40	1600		Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.					
			Unit = 1 MT					
			Taking output = 1 MT					
			a) Material					
			HYSD bars including 5 per cent overlaps and wastage	tonne	1.05	42532.00	44658.60	M-082
			Binding wire	Kg	6.00	62.27	373.62	M-072
			b) Labour for cutting, bending, shifting to site, tying and placing in position					
			Mate	day	0.40	272.00	108.80	L-12
			Blacksmith	day	2.00	345.00	690.00	L-02a
			Mazdoor	day	6.00	257.00	1542.00	L-13
			c) Overhead charges @ 0.21 on (a+b)				9948.33	
			d) Contractor's profit @ 0.1 on (a+b+c)				5732.14	
			Rate per MT (a+b+c+d)				63053.49	
						say	<b>63053.00</b>	
12.41	1600		Supplying, fitting and placing un-coated Mild steel reinforcement complete in foundation as per drawing and technical specification					
			Unit = 1 MT					
			Taking output = 1 MT					
			a) Material					
			MS bars including 5 per cent overlaps and wastage	tonne	1.05	45903.00	48198.15	M-126
			Binding wire	Kg	6.00	62.27	373.62	M-072
			b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
			Mate	day	0.43	272.00	116.96	L-12
			Blacksmith	day	2.25	345.00	776.25	L-02a
			Mazdoor	day	6.50	257.00	1670.50	L-13
			c) Overhead charges @ 0.21 on (a+b)				10738.45	
			d) Contractor's profit @ 0.1 on (a+b+c)				6187.39	
			Rate for per MT (a+b+c+d)				68061.32	
						say	<b>68061.00</b>	

C.A.S.  
12/8/19

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# **CHAPTER-13**

# **SUB-STRUCTURE**

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# Chapter – 13

## Sub structure

### Preamble:

1. Although, Substructures are generally constructed in cement concrete, the rate analysis for brick and stone masonry in CM 1:3 have also been included which can be adopted if permitted by design.
2. The cost of formwork will vary with the height of the substructure. Provision has accordingly been made.
3. As the higher grade of concrete is costlier, the provision made for formwork on percentage basis has been suitably adjusted to make it comparable with other grades.
4. Bridge bearing, being commercial items produced by specialized firms with imported technology and parts, the rates for the same are required to be ascertained from the market for the approved design and technical specifications.
5. Filter media and backfilling behind abutments are required to be provided as per guidelines given in IRC: 78-2000.
6. Weep holes shall be provided as per Clause 2706 of MoRT&H Specifications.
7. In case of roller-cum-rocker bearings, only full circular rollers are to be provided.
8. All bearings shall be set truly level so as to have full and even seating.
9. For elastomeric bearing pads, the concrete surface shall be levelled such that the variation is not more than 1.5 mm from a straight edge placed in any direction across the area.
10. The bearing should be procured only from those manufacturers who have been pre-qualified by the Ministry of Road Transport and Highways.
11. The bottoms of girders resting on the bearing shall be plane and truly horizontal.
12. For spans in grade, the bearing shall be placed horizontal by using sole plates for suitably designed RCC pedestals.

*Chandra*  
12/8/19





# Summary of Rate Analysis

## CHAPTER -13

### SUB - STRUCTURE

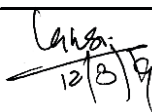
Item No.	Description	Unit	Rate (₹)
13.1	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and technical specifications: With Normal Bricks	cum	6054.00
	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and technical specifications: With FLY ASH Bricks	cum	5212.00
13.2	Pointing with cement mortar (1:3 ) on brick work in substructure as per Technical specifications	10 sqm	536.00
13.3	Plastering with cement mortar (1:3 ) on brick work in sub-structure as per Technical specifications	10 sqm	996.00
13.4	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications		
A	Random Rubble Masonry	cum	2951.00
B	Coursed rubble masonry (first sort )	cum	3125.00
C	Ashlar masonry ( first sort )	cum	4127.00
13.5	Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications		
A	PCC Grade M15		
(p)	Height upto 5m	cum	4070.00
B	PCC Grade M20		
(p)	Height upto 5m	cum	4331.00
C	PCC Grade M25		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	4750.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4632.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	4922.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4801.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	5138.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5011.00
D	PCC Grade M30		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	4795.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4672.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	4969.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4842.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	5187.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5054.00
E	RCC Grade M20		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	4432.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4310.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	4593.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4467.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	4794.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4663.00

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
F	RCC Grade M25		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	4853.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4733.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	5012.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4888.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	5251.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5121.00
G	RCC Grade M30		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	4878.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4760.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	5016.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4894.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	5211.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5084.00
H	RCC Grade M35		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	4996.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4875.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	5105.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4982.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	5268.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5141.00
13.6	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	tonne	63203.00
13.7	Supplying, fitting and placing Mild steel reinforcement complete in sub-structure as per drawing and technical specification	tonne	67321.00
13.8	Providing weep holes in Brick masonry/Plain/Reinforced concrete abutment, wing wall/return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical specifications	each	124.00
13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification		
A	Granular material	cum	616.00
B	(i) Sandy material - Fine Sand	cum	593.00
	(ii) Sandy material - Coarse Sand	cum	647.00
13.10	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and technical specification.	cum	949.00
13.11	Supplying, fitting and fixing in position true to line and level cast steel rocker bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	tonne capacity	420.00
13.12	Supplying, fitting and fixing in position true to line and level forged steel roller bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	tonne capacity	248.00

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
13.13	Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.	tonne capacity	#VALUE!
13.14	Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.	cubic centimetre	1.00
13.15	Supplying, fitting and fixing in position true to line and level sliding plate bearing with stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications.	tonne capacity	522.00
13.16	Supplying, fitting and fixing in position true to line and level POT-PTFE bearing consisting of a metal piston supported by a disc or unreinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, complete assembly to be of cast steel/fabricated structural steel, metal and elastomer elements to be as per IRC: 83 part-I & II respectively and other parts conforming to BS: 5400, section 9.1 & 9.2 and clause 2006 of MoRTH Specifications complete as per drawing and approved technical specifications.	tonne capacity	187.00

  
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Analysis of Rates  
CHAPTER - 13  
SUB - STRUCTURE

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
13.1	1300 & 2200	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and Technical Specifications					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Bricks 1st class	each	500.00	6.214	3107.00	M-079
		Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	0.24	3030.00	727.20	Item 12.6 (A)
		b) Labour					
		Mate	day	0.06	272.00	16.32	L-12
		Mason	day	0.80	345.00	276.00	L-11
		Mazdoor	day	0.80	257.00	205.60	L-13
		Add for scaffolding @ 5 per cent of cost of material and labour				216.61	
		c) Overhead charges @ 0.21 on (a+b)				955.23	
		d) Contractor's profit @ 0.1 on (a+b+c)				550.40	
		Rate per cum (a+b+c+d)				6054.35	
		With Normal Bricks			say	6054.00	
		With FLY ASH Bricks				5212.00	Sub_Analysis
13.2	1300 & 2200	Pointing with cement mortar (1:3 ) on brick work in substructure as per Technical Specifications					
		Unit = 10 sqm					
		Taking output = 10 sqm					
		a) Material					
		Cement mortar 1:3 (Rate as in Item 12.6 )	cum	0.03	3030.00	90.90	Item 12.6 (A)
		b) Labour					
		Mate	day	0.04	272.00	10.88	L-12
		Mason	day	0.50	345.00	172.50	L-11
		Mazdoor	day	0.50	257.00	128.50	L-13
		c) Overhead charges @ 0.21 on (a+b)				84.58	
		d) Contractor's profit @ 0.1 on (a+b+c)				48.74	
		Rate per 10 sqm (a+b+c+d)				536.10	
					say	536.00	
	Note	Scaffolding is already included in item 13.1					
13.3	1300 & 2200	Plastering with cement mortar (1:3 ) on brick work in sub-structure as per Technical Specifications					
		Unit = 10 sqm					
		Taking output = 10 sqm					
		a) Material					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.144	3030.00	436.32	Item 12.6 (A)
		b) Labour					
		Mate	day	0.04	272.00	10.88	L-12
		Mason	day	0.50	345.00	172.50	L-11
		Mazdoor	day	0.50	257.00	128.50	L-13
		c) Overhead charges @ 0.21 on (a+b)				157.12	
		d) Contractor's profit @ 0.1 on (a+b+c)				90.53	
		Rate per 10 sqm (a+b+c+d)				995.85	
					say	996.00	
	Note	1.Scaffolding is already included in item no. 13.1					
		2.The number of masons and Mazdoors already catered in the cement mortar have been taken into account while providing these categories in brick masonry, pointing and plastering.					
13.4	1400 & 2200	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications					
	A	Random Rubble Masonry					
		( coursed/uncoursed )					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					

Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Stone	cum	1.00	288.85	288.85	M-148
		Through and bond stone	No	7.00	10.48	73.36	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.33	3030.00	999.90	Item 12.6 (A)
		<b>b) Labour</b>					
		Mate	day	0.10	272.00	27.20	L-12
		Mason	day	1.20	345.00	414.00	L-11
		Mazdoor	day	1.20	257.00	308.40	L-13
		Add for scaffolding @ 5 per cent of cost of a) Material and b) Labour				105.59	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				465.63	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				268.29	
		<b>Rate per cum (a+b+c+d)</b>				2951.22	
					<b>say</b>	<b>2951.00</b>	
13.4	B	<b>Coursed rubble masonry (first sort )</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Material</b>					
		Stone	cum	1.10	288.85	317.74	M-148
		Through and bond stone	each	7.00	10.48	73.36	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.30	3030.00	909.00	Item 12.6 (A)
		<b>b) Labour</b>					
		Mate	day	0.12	272.00	32.64	L-12
		Mason	day	1.50	345.00	517.50	L-11
		Mazdoor	day	1.50	257.00	385.50	L-13
		Add for scaffolding @ 5 per cent of cost of material and labour				111.79	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				492.98	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				284.05	
		<b>Rate per cum (a+b+c+d)</b>				3124.55	
					<b>say</b>	<b>3125.00</b>	
13.4	C	<b>Ashlar masonry ( first sort )</b>					
		<b>Plain ashlar</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Material</b>					
		Stone	cum	1.11	288.84	320.61	M-169
		Through and bond stone	each	7.00	10.48	73.36	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.33	3030.00	999.90	Item 12.6 (A)
		<b>b) Labour for masonry work</b>					
		Mate	day	0.20	272.00	54.40	L-12
		Mason	day	2.50	345.00	862.50	L-11
		Mazdoor	day	2.50	257.00	642.50	L-13
		Add for scaffolding @ 5 per cent of cost of a) Material and b) Labour				147.66	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				651.20	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				375.21	
		<b>Rate per cum (a+b+c+d)</b>				4127.35	
					<b>say</b>	<b>4127.00</b>	
	Note	The labour already considered in the cement mortar have been taken into account while providing these categories in the stone masonry works.					
13.5	1500, 1700 & 2200	<b>Plain/Reinforced cement concrete in sub-structure complete as per drawing and Technical Specifications</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					

Calc.  
12/8/19

Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		A	PCC Grade M15					
		(p)	Height upto 5m					
			Same as Item 12.8 (A) upto 5 m height, except for formwork which shall be 10 per cent instead of 4 per cent of cost of material, labour and machinery.					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (A)				2780.00	Item 12.8 (A)
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		278.00	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				642.18	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				370.02	
			Rate per cum (a+b+c+d+e+f)				4070.20	
						say	<u>4070.00</u>	
13.5		B	PCC Grade M20					
		(p)	Height upto 5m					
			Same as Item 12.8 (B) upto 5 m height, except for formwork which shall be 10 per cent instead of 4 per cent of cost of material, labour and machinery.					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (B)				2958.00	Item 12.8 (B) PCC
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		295.80	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				683.30	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				393.71	
			Rate per cum (a+b+c+d+e+f)				4330.81	
						say	<u>4331.00</u>	
13.5		C	PCC Grade M25					
		(p)	Height upto 5m					
			Same as Item 12.8 (D) upto 5 m height with the only change that the provision of form work shall be 10 per cent instead of 3.75 per cent of cost of material, labour and machinery.					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case I				3244.00	Item 12.8 (D) i
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		324.40	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				749.36	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				431.78	
			Rate per cum (a+b+c+d+e+f)				4749.54	
						say	<u>4750.00</u>	
13.5 C (p)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case II				3164.00	Item 12.8 (D)
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		316.40	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				730.88	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				421.13	
			Rate per cum (a+b+c+d+e+f)				4632.41	
						say	<u>4632.00</u>	
13.5 C		(q)	Height 5m to 10m					



Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Same as Item 12.8 (D) with the following changes: (i) Add 2 per cent of cost of material, Labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 12 per cent instead of 3.75 per cent of cost of material, labour and machinery					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case I				3244.00	Item 12.8 (D) i
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		389.28	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		64.88	
		e) Overhead charges @ 0.21 on (a+b+c+d)				776.61	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				447.48	
		Rate per cum (a+b+c+d+e+f)				4922.25	
					say	<u>4922.00</u>	
13.5 C (q)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case II				3164.00	Item 12.8 (D)
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		379.68	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		63.28	
		e) Overhead charges @ 0.21 on (a+b+c+d)				757.46	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				436.44	
		Rate per cum (a+b+c+d+e+f)				4800.86	
					say	<u>4801.00</u>	
13.5 C	(r)	Height above 10m					
		Same as Item 12.8 (D) with the following changes: (i) Add 4 per cent of cost of material, labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 15 per cent instead of 3.75 per cent of cost of material, labour and machinery.					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case I				3244.00	Item 12.8 (D) i
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		486.60	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		129.76	
		e) Overhead charges @ 0.21 on (a+b+c+d)				810.68	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				467.10	
		Rate per cum (a+b+c+d+e+f)				5138.14	
					say	<u>5138.00</u>	
13.5 C (r)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case II				3164.00	Item 12.8 (D)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		474.60	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		126.56	
		e) Overhead charges @ 0.21 on (a+b+c+d)				790.68	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				455.58	
		Rate per cum (a+b+c+d+e+f)				5011.43	
					say	<u>5011.00</u>	

Calc. 12/8/19

Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
13.5		D	PCC Grade M30					
		(p)	Height upto 5m					
			Same as Item 12.8 (F) upto 5 m height with the only change that the provision of form work shall be 10 per cent instead of 3.50 per cent of cost of material, labour and machinery.					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case I				3275.00	Item 12.8 (F)
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		327.50	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				756.53	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				435.90	
			Rate per cum (a+b+c+d+e+f)				4794.93	
						say	<u>4795.00</u>	
13.5 D (p)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case II				3191.00	Item 12.8 (F)ii
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		319.10	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				737.12	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				424.72	
			Rate per cum (a+b+c+d+e+f)				4671.94	
						say	<u>4672.00</u>	
13.5 D		(q)	Height 5m to 10m					
			Same as Item 12.8 (F) with the following changes: (i) Add 2 per cent of cost of material, Labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 12 per cent instead of 3.50 per cent of cost of material, labour and machinery.					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case I				3275.00	Item 12.8 (F)
			d) formwork					
			Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		393.00	
			Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		65.50	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				784.04	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				451.75	
			Rate per cum (a+b+c+d+e+f)				4969.29	
						say	<u>4969.00</u>	
13.5 D (q)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case II				3191.00	Item 12.8 (F)ii
			d) formwork					
			Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		382.92	
			Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		63.82	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				763.93	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				440.17	
			Rate per cum (a+b+c+d+e+f)				4841.83	
						say	<u>4842.00</u>	
13.5 D		(r)	Height above 10m					

Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Same as Item 12.8 (F) with the following changes: (i) Add 4 per cent of cost of material, labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 15 per cent instead of 3.50 per cent of cost of material, labour and machinery					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case I				3275.00	Item 12.8 (F)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		491.25	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		131.00	
		e) Overhead charges @ 0.21 on (a+b+c+d)				818.42	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				471.57	
		Rate per cum (a+b+c+d+e+f)				5187.24	
					say	<u>5187.00</u>	
13.5 D (r)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case II				3191.00	Item 12.8 (F)ii
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		478.65	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		127.64	
		e) Overhead charges @ 0.21 on (a+b+c+d)				797.43	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				459.47	
		Rate per cum (a+b+c+d+e+f)				5054.19	
					say	<u>5054.00</u>	
13.5	E	RCC Grade M20					
	(p)	Height upto 5m					
		Same as Item 12.8 (C) upto 5 m height, except for formwork which shall be 10 per cent instead of 4 per cent of cost of material, labour and machinery.					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case I				3027.00	Item 12.8 (C)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		302.70	
		e) Overhead charges @ 0.21 on (a+b+c+d)				699.24	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				402.89	
		Rate per cum (a+b+c+d+e+f)				4431.83	
					say	<u>4432.00</u>	
13.5 E (p)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case II				2944.00	Item 12.8 C II RCC
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		294.40	
		e) Overhead charges @ 0.21 on (a+b+c+d)				680.06	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				391.85	
		Rate per cum (a+b+c+d+e+f)				4310.31	
					say	<u>4310.00</u>	
13.5 E	(q)	Height 5m to 10m					
		For height, upto 10m, add 2 per cent of cost as above excluding formwork. For cost of formwork add 12 per cent of cost of material, labour and machinery instead of 4 per cent .					

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Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case I				3027.00	Item 12.8 (C)
			d) formwork					
			Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		363.24	
			Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		60.54	
			e) Overhead charges @ 0.21 on (a+b+c+d)				724.66	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				417.54	
			Rate per cum (a+b+c+d+e+f)				4592.99	
						say	<u>4593.00</u>	
13.5 E (q)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case II				2944.00	Item 12.8 C II RCC
			d) formwork					
			Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		353.28	
			Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		58.88	
			e) Overhead charges @ 0.21 on (a+b+c+d)				704.79	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				406.10	
			Rate per cum (a+b+c+d+e+f)				4467.05	
						say	<u>4467.00</u>	
13.5 E		(r)	Height above 10m					
			Same as Item 12.8 (C) with the following changes: (i) Add 4 per cent of cost of material, labour and machinery excluding form work to cater for extra lift. (ii) The provision of form work shall be 15 per cent instead of 4 per cent of cost of material, labour and machinery.					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case I				3027.00	Item 12.8 (C)
			d) formwork					
			Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		454.05	
			Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		121.08	
			e) Overhead charges @ 0.21 on (a+b+c+d)				756.45	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				435.86	
			Rate per cum (a+b+c+d+e+f)				4794.44	
						say	<u>4794.00</u>	
13.5 E (r)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (C) Case II				2944.00	Item 12.8 C II RCC
			d) formwork					
			Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		441.60	
			Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		117.76	
			e) Overhead charges @ 0.21 on (a+b+c+d)				735.71	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				423.91	
			Rate per cum (a+b+c+d+e+f)				4662.97	
						say	<u>4663.00</u>	
13.5		F	RCC Grade M25					
		(p)	Height upto 5m					

Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Same as Item 12.8 (E) upto 5m height, excluding formwork. For cost of formwork, add 10 per cent of cost of material, labour and machinery instead of 3.75 per cent .					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case I				3315.00	Item 12.8 (E)
			d) formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		331.50	
			e) Overhead charges @ 0.21 on (a+b+c+d)				765.77	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				441.23	
			Rate per cum (a+b+c+d+e+f)				4853.49	
						say	<u>4853.00</u>	
13.5 F (p)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case II				3233.00	Item 12.8 (E) ii
			d) formwork					DIR used item
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		323.30	
			e) Overhead charges @ 0.21 on (a+b+c+d)				746.82	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				430.31	
			Rate per cum (a+b+c+d+e+f)				4733.44	
						say	<u>4733.00</u>	
13.5 F		(q)	Height 5m to 10m					
			For height, upto 10m, add 1.8 per cent of cost as above excluding formwork. For cost of formwork add 11.8 per cent of cost of material, labour and machinery					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case I				3315.00	Item 12.8 (E)
			d) formwork					
			Add 11.8 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.80		391.17	
			Add 1.8 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.80		59.67	
			e) Overhead charges @ 0.21 on (a+b+c+d)				790.83	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				455.67	
			Rate per cum (a+b+c+d+e+f)				5012.33	
						say	<u>5012.00</u>	
13.5 F (q)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case II				3233.00	Item 12.8 (E) ii
			d) formwork					DIR used item
			Add 11.8 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.80		381.49	
			Add 1.8 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.80		58.19	
			e) Overhead charges @ 0.21 on (a+b+c+d)				771.26	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				444.40	
			Rate per cum (a+b+c+d+e+f)				4888.35	
						say	<u>4888.00</u>	
13.5 F		(r)	Height above 10m					
			For height, above 10m, add 4 per cent of cost as above excluding formwork. For cost of formwork add 15 per cent of cost of material, labour and machinery					
		Case I	Using concrete Mixer					

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**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case I				3315.00	Item 12.8 (E)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		497.25	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		132.60	
		e) Overhead charges @ 0.21 on (a+b+c+d)				828.42	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				477.33	
		Rate per cum (a+b+c+d+e+f)				5250.60	
					say	<u>5251.00</u>	
13.5 F (r)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case II				3233.00	Item 12.8 (E) ii
		d) formwork					DIR used item
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		484.95	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		129.32	
		e) Overhead charges @ 0.21 on (a+b+c+d)				807.93	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				465.52	
		Rate per cum (a+b+c+d+e+f)				5120.72	
					say	<u>5121.00</u>	
13.5	G (p)	RCC Grade M30 Height upto 5m					
		Same as Item 12.8 (G) upto 5m height, excluding formwork. For cost of formwork, add 10 per cent of cost of material, labour and machinery instead of 3.5 per cent.					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case I				3332.00	Item 12.8 (G)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		333.20	
		e) Overhead charges @ 0.21 on (a+b+c+d)				769.69	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				443.49	
		Rate per cum (a+b+c+d+e+f)				4878.38	
					say	<u>4878.00</u>	
13.5 G (p)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case II				3251.00	Item 12.8 (G) ii
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		325.10	
		e) Overhead charges @ 0.21 on (a+b+c+d)				750.98	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				432.71	
		Rate per cum (a+b+c+d+e+f)				4759.79	
					say	<u>4760.00</u>	
13.5 G	(q)	Height 5m to 10m					
		For height, upto 10m, add 1.6 per cent of cost as above excluding formwork. For cost of formwork add 11.5 per cent of cost of material, labour and machinery					
	Case I	Using concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case I				3332.00	Item 12.8 (G)
		d) formwork					
		Add 11.5 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.50		383.18	

Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Add 1.6 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.60		53.31	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				791.38	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				455.99	
			Rate per cum (a+b+c+d+e+f)				5015.86	
						say	<u>5016.00</u>	
13.5 G (q)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case II				3251.00	Item 12.8 (G) ii
		d)	formwork					
			Add 11.5 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.50		373.87	
			Add 1.6 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.60		52.02	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				772.15	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				444.90	
			Rate per cum (a+b+c+d+e+f)				4893.93	
						say	<u>4894.00</u>	
13.5 G		(r)	Height above 10m					
			For height, above 10m, add 3.5 per cent of cost as above excluding formwork. For cost of formwork add 14 per cent of cost of material, labour and machinery					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case I				3332.00	Item 12.8 (G)
		d)	formwork					
			Add 14 per cent of cost of material, labour and machinery (a+b+c) for Formwork		14.00		466.48	
			Add 3.5 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.50		116.62	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				822.17	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				473.73	
			Rate per cum (a+b+c+d+e+f)				5211.00	
						say	<u>5211.00</u>	
13.5 G (r)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (G) Case II				3251.00	Item 12.8 (G) ii
		d)	formwork					
			Add 14 per cent of cost of material, labour and machinery (a+b+c) for Formwork		14.00		455.14	
			Add 3.5 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.50		113.79	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				802.18	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				462.21	
			Rate per cum (a+b+c+d+e+f)				5084.32	
						say	<u>5084.00</u>	
13.5		H	RCC Grade M35					
		(p)	Height upto 5m					
			Same as Item 12.8 (H) upto 5m height, excluding formwork. For cost of formwork, add 10 per cent of cost of material, labour and machinery instead of 3 per cent.					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case I				3412.00	Item 12.8 (H) Case I
		d)	formwork					
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		341.20	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				788.17	

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Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				454.14	
			Rate per cum (a+b+c+d+e+f)				4995.51	
						say	<u>4996.00</u>	
13.5 H (p)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case II				3330.00	12.8 (H) Case II
			d) formwork					DIR used item
			Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		333.00	
			e) Overhead charges @ 0.21 on (a+b+c+d)				769.23	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				443.22	
			Rate per cum (a+b+c+d+e+f)				4875.45	
						say	<u>4875.00</u>	
13.5 H		(q)	Height 5m to 10m					
			For height, upto 10m, add 1.4 per cent of cost as above excluding formwork. For cost of formwork add 11 per cent of cost of material, labour and machinery.					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case I				3412.00	Item 12.8 (H) Case I
			d) formwork					
			Add 11 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.00		375.32	
			Add 1.4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.40		47.77	
			e) Overhead charges @ 0.21 on (a+b+c+d)				805.37	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				464.05	
			Rate per cum (a+b+c+d+e+f)				5104.50	
						say	<u>5105.00</u>	
13.5 H (q)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case II				3330.00	12.8 (H) Case II
			d) formwork					
			Add 11 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.00		366.30	
			Add 1.4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.40		46.62	
			e) Overhead charges @ 0.21 on (a+b+c+d)				786.01	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				452.89	
			Rate per cum (a+b+c+d+e+f)				4981.83	
						say	<u>4982.00</u>	
13.5 H		(r)	Height above 10m					
			For height, above 10m, add 3 per cent of cost as above excluding formwork. For cost of formwork add 13 per cent of cost of material, labour and machinery					
		Case I	Using concrete Mixer					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case I				3412.00	Item 12.8 (H) Case I
			d) formwork					
			Add 13 per cent of cost of material, labour and machinery (a+b+c) for Formwork		13.00		443.56	
			Add 3 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.00		102.36	
			e) Overhead charges @ 0.21 on (a+b+c+d)				831.16	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				478.91	
			Rate per cum (a+b+c+d+e+f)				5267.99	
						say	<u>5268.00</u>	



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**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
13.5 H (r)		Case II	With Batching Plant, Transit Mixer and Concrete Pump					
			Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (H) Case II				3330.00	12.8(H)Case II
			d) formwork					
			Add 13 per cent of cost of material, labour and machinery (a+b+c) for Formwork		13.00		432.90	
			Add 3 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.00		99.90	
			e) Overhead charges @ 0.21 on (a+b+c+d)				811.19	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				467.40	
			Rate per cum (a+b+c+d+e+f)				5141.39	
						say	<u>5141.00</u>	
	Note		The basic components of this analysis are the same as those of items 13.8 (A to H). The only changes are as under:					
			a) Ramps/Stairs: Extra expenditure on structures which are more than 5 m high @ 2 per cent of cost for height upto 10 m and 4 per cent for heights above 10 m will be involved for approaching the work spot by providing higher ramp/stair case for use by the working parties.					
			b) The above mentioned percentages have been suitably modified for different categories as cost for various categories varies, whereas effort for access for same height will be similar. As the cost of richer concrete is comparatively more, the percentage to be added has been reduced to maintain the same cost for extra efforts.					
13.6	Section 1600 & 2200		Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and Technical Specifications					
			Output: MT					
			Taking output = 1 MT					
			a) Material					
			HYSD bars including 5 per cent overlaps and wastage	tonne	1.05	42532.00	44658.60	M-082
			Binding wire	kg	6.00	62.27	373.62	M-072
			b) Labour for cutting, bending, shifting to site, tying and placing in position					
			Mate	day	0.34	272.00	92.48	L-12
			Blacksmith	day	2.00	345.00	690.00	L-02a
			Mazdoor	day	6.50	257.00	1670.50	L-13
			c) Overhead charges @ 0.21 on (a+b)				9971.89	
			d) Contractor's profit @ 0.1 on (a+b+c)				5745.71	
			Rate for per MT (a+b+c+d)				63202.80	
						say	<u>63203.00</u>	
13.7	1600 & 2200		Supplying, fitting and placing Mild steel reinforcement complete in sub-structure as per drawing and Technical Specification					
			Unit = MT					
			Taking output = 1 MT					
			a) Material					
			MS bars including 5 per cent overlaps and wastage	tonne	1.05	45903.00	48198.15	M-126
			Binding wire	kg	6.00	62.27	373.62	M-072
			b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
			Mate	day	0.28	272.00	76.16	L-12
			Blacksmith	day	1.50	345.00	517.50	L-02a
			Mazdoor	day	5.50	257.00	1413.50	L-13
			c) Overhead charges @ 0.21 on (a+b)				10621.58	
			d) Contractor's profit @ 0.1 on (a+b+c)				6120.05	
			Rate for per MT (a+b+c+d)				67320.56	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
					say	<u>67321.00</u>	
13.8	2706 & 2200	Providing weep holes in Brick masonry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 100 mm dia AC pipe, extending through the full width of the structure with slope of 1V :20H towards drawing face. Complete as per drawing and Technical Specifications					
		Unit = Nos.					
		Taking output = 30 Nos.					
		a) Material					
		AC pipe 100 mm dia. (including wastage @ 5 per cent)	metre	31.50	40.75	1283.63	M-056
		Average length of weep hole is taken as one metre for the purpose of estimating.					
		MS clamp	each.	30.00	35.97	1079.10	M-123
		collar for AC pipe (average) taking 10% of above pipe rate	each.	10.00	4.08	40.75	M-056/10
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.05	3030.00	151.50	Item 12.6 (A)
		b) Labour					
		Mate	day	0.03	272.00	8.16	L-12
		Mason	day	0.50	345.00	172.50	L-11
		Mazdoor	day	0.25	257.00	64.25	L-13
		c) Overhead charges @ 0.21 on (a+b)				587.98	
		d) Contractor's profit @ 0.1 on (a+b+c)				338.79	
		Cost for 30 m = a+b+c+d				3726.65	
		Rate per No. (a+b+c+d)/30				124.22	
					say	<u>124.00</u>	
	Note	1. In case of stone masonry, the size of the weep hole shall be 150 mm x 80 mm or circular with 150 mm diameter.					
		2. For structure in stone masonry, the weep holes shall be deemed to be included in the item of stone masonry work and shall not be paid separately.					
13.9	710.1.4 of IRC:78 & 2200	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical Specification					
		Unit = cum					
		Taking output = 10 cum					
		A Granular material					
		a) Labour					
		Mate	day	0.28	272.00	76.16	L-12
		Mazdoor	day	7.00	257.00	1799.00	L-13
		b) Material					
		Granular material	cum	12.00	131.53	1578.36	M-009
		c) Machinery					
		Plate compactor/power rammer	hour	2.50	467.00	1167.50	P&M-086
		Water Tanker	hour	0.05	183.00	9.15	P&M-060
		d) Overhead charges @ 0.21 on (a+b+c)				972.34	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				560.25	
		Cost for 10 cum of granular backfill = a+b+c+d+e				6162.76	
		Rate per cum = (a+b+c+d+e)/10				616.28	
					say	<u>616.00</u>	
13.9		B Sandy material					
		a) Labour					
		Mate	day	0.28	272.00	76.16	L-12
		Mazdoor for filling, watering, ramming etc.	day	7.00	257.00	1799.00	L-13
		b) Material					
		Sand (Fine)	cum	12.00	116.85	1402.20	M-006
		c) Machinery					

Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Plate compactor/power rammer	hour	2.50	467.00	1167.50	P&M-086
		Water Tanker	hour	0.06	183.00	10.98	P&M-060
		d) Overhead charges @ 0.21 on (a+b+c)				935.73	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				539.16	
		Cost for 10 cum of sandy backfill = a+b+c+d+e				5930.72	
		Rate per cum = (a+b+c+d+e)/10				593.07	
		Sandy material - Fine Sand			say	<u>593.00</u>	
		Sandy material - Coarse Sand				<u>647.00</u>	Sub_Analysis
13.10	710.1.4. of IRC:78 and 2200	Providing and laying of Filter media with granular materials/stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. of MoRTH specifications to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition complete as per drawing and Technical Specification.					
		Unit = cum					
		Taking output = 10 cum.					
		a) Labour					
		Mate	day	0.32	272.00	87.04	L-12
		Mazdoor for filling, watering, ramming etc.	day	7.00	257.00	1799.00	L-13
		Mazdoor (Skilled)	day	1.00	325.00	325.00	L-15
		b) Material					
		Filter media of stone aggregate conforming to clause 2504.2.2. of MoRTH specifications.	cum	12.00	408.83	4905.96	M-012
		c) Machinery					
		Water Tanker of 6 KL capacity	hour	0.06	183.00	10.98	P&M-060
		d) Overhead charges @ 0.21 on (a+b+c)				1496.88	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				862.49	
		cost for 10 cum of Fiter Media = a+b+c+d+e				9487.34	
		Rate per cum = (a+b+c+d+e)/10				948.73	
					say	<u>949.00</u>	
13.11	2000, 1000 & 2200	Supplying, fitting and fixing in position true to line and level cast steel rocker bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.					
		Unit: one tonne capacity					
		Considering a 250 tonne capacity bearing for this analysis					
		a) Labour					
		Mate	day	0.06	272.00	16.32	L-12
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
		Mazdoor	day	1.00	257.00	257.00	L-13
		b) Material					
		Cast steel rocker bearing assembly of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications	each.	1.00	77610.30	77610.30	M-065
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.				776.10	
		c) Overhead charges @ 0.21 on (a+b)				16552.67	
		d) Contractor's profit @ 0.1 on (a+b+c)				9537.49	
		cost for 250 tonnes capacity bearing = a+b+c+d				104912.38	
		Rate per tonne capacity = (a+b+c+d)/250				419.65	
					say	<u>420.00</u>	

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Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
13.12	2000 , 1000 & 2200	Supplying, fitting and fixing in position true to line and level forged steel roller bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.					
		Unit: one tonne capacity					
		Considering a 250 tonne capacity bearing for this analysis					
		<b>a) Labour</b>					
		Mate	day	0.06	272.00	16.32	L-12
		Mazdoor	day	1.00	257.00	257.00	L-13
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
		<b>b) Material</b>					
		Forged steel roller bearing of 250 tonne design load capacity duly painted complete with all its components as per drawing and specifications	each.	1.00	45625.63	45625.63	M-067
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.				456.26	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				9768.72	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				5628.64	
		cost for 250 tonnes capacity bearing = a+b+c+d				61915.07	
		<b>Rate per tonne capacity = (a+b+c+d)/250</b>				247.66	
					say	<b>248.00</b>	
13.13	2000 & 2200	Supplying, fitting and fixing in position true to line and level sliding plate bearing with PTFE surface sliding on stainless steel complete including all accessories as per drawing and Technical Specifications and BS: 5400, section 9.1 & 9.2 (for PTFE) and clause 2004 of MoRTH Specifications.					
		Unit: one tonne capacity					
		Considering a 80 tonne capacity bearing for this analysis					
		<b>a) Labour</b>					
		Mate	day	0.06	272.00	16.32	L-12
		Mazdoor	day	1.00	257.00	257.00	L-13
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
		<b>b) Material</b>					
		PTFE sliding plate bearing assembly of 80 tonnes design load capacity duly painted complete with all its components as per drawing and Technical Specifications	each.	1.00	input	#VALUE!	M-069
		Add 1 per cent for foundation anchorage bolts and consumables.				#VALUE!	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				#VALUE!	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				#VALUE!	
		cost for 80 tonnes capacity bearing = a+b+c+d				#VALUE!	
		<b>Rate per tonne capacity = (a+b+c+d)/80</b>				#VALUE!	
					say	<b>#VALUE!</b>	
13.14	2000 & 2200	Supplying, fitting and fixing in position true to line and level elastomeric bearing conforming to IRC: 83 (Part-II) section IX and clause 2005 of MoRTH specifications complete including all accessories as per drawing and Technical Specifications.					
		Unit: one cubic centimetre					
		Considering an elastomeric bearing of size 500 x 400 x 96 mm for this analysis.					
		Overall volume - 19200 cu.cm					
		Volume of 6 nos. 488 x 388 x 4 mm size reinforcing steel plates = 4545 cu.cm.					
		Hence volume of elastometer = 14655 cu.cm.					
		<b>a) Labour</b>					

Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	0.06	272.00	16.32	L-12
		Mazdoor	day	1.00	257.00	257.00	L-13
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
		<b>b) Material</b>					
		Elastomeric bearing assembly consisting of 7 layers of elastomer bonded to 6 nos. internal reinforcing steel laminates by the process of vulcanisation, complete with all components as per drawing and Technical Specifications.	cum	19200.00	0.59	11328.00	M-066
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				113.28	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				2494.19	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1437.13	
		cost for 19200cc of elastomeric bearing = a+b+c+d				15808.42	
		<b>Rate per cc of elastomeric bearing = (a+b+c+d)/19200</b>				0.82	
					<b>say</b>	<b>1.00</b>	
13.15	2000 & 2200	Supplying, fitting and fixing in position true to line and level sliding plate bearing with stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications.					
		Unit: one tonne capacity					
		Considering the sliding bearing of 80 tonnes design capacity for this analysis.					
		<b>a) Labour</b>					
		Mate	day	0.04	272.00	10.88	L-12
		Mazdoor	day	0.75	257.00	192.75	L-13
		Mazdoor (Skilled)	day	0.35	325.00	113.75	L-15
		<b>b) Material</b>					
		Supply of sliding plate bearing of 80 tonne design capacity complete as per drawings and Technical Specifications.	each.	1.00	30724.33	30724.33	M-070
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				307.24	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				6583.28	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				3793.22	
		cost for 80 tonnes of capacity bearing = a+b+c+d				41725.46	
		<b>Rate per tonne Capacity =(a+b+c+d) / 80</b>				521.57	
					<b>say</b>	<b>522.00</b>	
13.16	2000 & 2200	Supplying, fitting and fixing in position true to line and level POT-PTFE bearing consisting of a metal piston supported by a disc or unreinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, complete assembly to be of cast steel/fabricated structural steel, metal and elastomer elements to be as per IRC: 83 part-I & II respectively and other parts conforming to BS: 5400, section 9.1 & 9.2 and clause 2006 of MoRTH Specifications complete as per drawing and approved Technical Specifications.					
		Unit: one tonne capacity				387.20	
		Considering a Pot bearing assembly of 250 tonne capacity for this analysis.					
		<b>a) Labour</b>					
		Mate	day	0.08	272.00	21.76	L-12
		Mazdoor	day	1.50	257.00	385.50	L-13
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
		<b>b) Material</b>					

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Analysis of Rates  
**SUB - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Pot type bearing assembly consisting of a metal piston supported by a disc, PTFE pads providing sliding surfaces against stainless steel mating together with cast steel assemblies/fabricated structural steel assemblies duly painted with all components as per clause 2006 and complete as per drawings and Technical Specifications.	MT	250.00	137.10	34275.00	M-068
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				342.75	
		c) Overhead charges @ 0.21 on (a+b)				7389.38	
		d) Contractor's profit @ 0.1 on (a+b+c)				4257.69	
		cost for 250 tonnes capacity bearing = a+b+c+d				46834.58	
		Rate per tonne capacity = (a+b+c+d)/250				187.34	
					say	<u>187.00</u>	

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## **CHAPTER-14**

# **SUPER-STRUCTURE**

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# Chapter – 14

## Superstructure

### Preamble:

1. The rate for the wearing coat has been analysed as under:

- a) Cement concrete wearing coat
- b) Asphaltic concrete wearing coat
- c) Bitumen mastic wearing coat

The item may be selected as per approved design. In case the thickness of wearing coat is different from that analysed, the rate for the desired thickness may be worked out on pro-rata basis.

2. The rate analysis has been done both for RCC Railing and M.S. Railing, which can be adopted as per approved design.
3. The length of drainage spout has been provided in such a way that it is connected to the drainage system on the ground in case of flyovers and there is no splashing of water on the structure in case of bridges.
4. The rate for anti-corrosive treatment is required to be ascertained from firms specialised in this work. In this connection Circular No. RW/NH-34041/44/91-S&R dated 21.3.2000 of Ministry of Road Transport and Highways may be referred for further details.
5. Expansion joints involving movements exceeding 40 mm are specialised readymade items commercially produced by reputed firms with imported technology and parts. The rates for such joints are required to be ascertained from the firms pre-qualified by the Ministry.
6. The rate analysis for pre-cast and pre-tensioned girders has also been included.
7. The rate analysis for prestressed cement concrete of M 60 grade has also been included which can be adopted for bridges with innovative design/construction.
8. MoRT&H letter No. RW/NH-34059/1/96 S&R dated 30.11.2000 and subsequent corrigendum dated 25.1.2001 may be referred for detailed specifications and provisions for various types of expansion joints.
9. Supply of new type of expansion joint may be obtained on the basis of competitive bidding from amongst the suppliers pre-qualified by the Ministry of Road Transport and Highways. Further, a warranty of 10 years of trouble free performance may be insisted from the suppliers.
10. For bridges having wide deck/span length of more than 120 m or/and involving complex movements/rotations in different directions/planes, provision of special type of modular expansion joints such as swivel joists joints are required for which firms specialized in this field may be consulted. Such cases will require prior approval of Ministry.

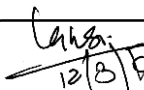


Summary of Rate Analysis  
**CHAPTER - 14**  
**SUPER - STRUCTURE**

Item No.	Description	Unit	Rate (₹)
14.1	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification		
A	RCC Grade M20		
Case I	Using Concrete Mixer		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	4785.00
(q)	Height 5m to 10m	cum	4984.00
(r)	Height above 10m	cum	5183.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	4984.00
(q)	Height 5m to 10m	cum	5183.00
(r)	Height above 10m	cum	5383.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	4652.00
(q)	Height 5m to 10m	cum	4845.00
(r)	Height above 10m	cum	5039.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	4845.00
(q)	Height 5m to 10m	cum	5039.00
(r)	Height above 10m	cum	5233.00
B	RCC Grade M25		
Case I	Using Concrete Mixer		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	5262.00
(q)	Height 5m to 10m	cum	5482.00
(r)	Height above 10m	cum	5701.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	5482.00
(q)	Height 5m to 10m	cum	5701.00
(r)	Height above 10m	cum	5920.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	5135.00
(q)	Height 5m to 10m	cum	5348.00
(r)	Height above 10m	cum	5562.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	5348.00
(q)	Height 5m to 10m	cum	5562.00
(r)	Height above 10m	cum	5776.00
C	RCC Grade M 30		
Case I	Using Concrete Mixer		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	5351.00
(q)	Height 5m to 10m	cum	5574.00
(r)	Height above 10m	cum	5797.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	5574.00

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
(q)	Height 5m to 10m	cum	5797.00
(r)	Height above 10m	cum	6020.00
<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Concrete Pump.</b>		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	5197.00
(q)	Height 5m to 10m	cum	5413.00
(r)	Height above 10m	cum	5630.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	5413.00
(q)	Height 5m to 10m	cum	5630.00
(r)	Height above 10m	cum	5846.00
<b>D</b>	<b>RCC/PSC Grade M35</b>		
<b>Case 1</b>	<b>Using concrete mixer.</b>		
(i)	For solid slab super-structure, 18-28% of (a+b+c)		
(p)	Height upto 5m	cum	5386.00
(q)	Height 5m to 10m	cum	5614.00
(r)	Height above 10m	cum	5843.00
(ii)	For T-beam & slab, 23-33% of (a+b+c)		
(p)	Height upto 5m	cum	5614.00
(q)	Height 5m to 10m	cum	5843.00
(r)	Height above 10m	cum	6071.00
(iii)	For box girder and balanced cantilever, 38-58% of cost of concrete.		
(p)	Height upto 5m	cum	6299.00
(q)	Height 5m to 10m	cum	6756.00
(r)	Height above 10m	cum	7212.00
<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>		
(i)	For solid slab super-structure, 18-28% of (a+b+c)		
(p)	Height upto 5m	cum	5234.00
(q)	Height 5m to 10m	cum	5455.00
(r)	Height above 10m	cum	5677.00
(ii)	For T-beam & slab, 23-33% of (a+b+c)		
(p)	Height upto 5m	cum	5455.00
(q)	Height 5m to 10m	cum	5677.00
(r)	Height above 10m	cum	5899.00
(iii)	For box girder and balanced cantilever, 38-58% of cost of concrete.		
(p)	Height upto 5m	cum	6121.00
(q)	Height 5m to 10m	cum	6564.00
(r)	Height above 10m	cum	7008.00
<b>E</b>	<b>PSC Grade M-40</b>		
<b>Case 1</b>	<b>Using concrete mixer.</b>		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	6047.00
(q)	Height 5m to 10m	cum	6299.00
(r)	Height above 10m	cum	6551.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	6299.00
(q)	Height 5m to 10m	cum	6551.00
(r)	Height above 10m	cum	6803.00
<b>Case II</b>	<b>Using Batching Plant, Transit Mixer and Concrete Pump</b>		
(i)	For solid slab super-structure, 18-28% of (a+b+c)		
(p)	Height upto 5m	cum	5753.00

  
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### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
(q)	Height 5m to 10m	cum	5997.00
(r)	Height above 10m	cum	6241.00
(ii)	For T-beam & slab, 23-33% of (a+b+c)		
(p)	Height upto 5m	cum	5997.00
(q)	Height 5m to 10m	cum	6241.00
(r)	Height above 10m	cum	6484.00
(iii)	For box girder and balanced cantilever, 38-58% of cost of concrete.		
(p)	Height upto 5m	cum	6728.00
(q)	Height 5m to 10m	cum	7216.00
(r)	Height above 10m	cum	7703.00
F	PSC Grade M-45		
(i)	For solid slab/voided slab super-structure, 16-26% of cost of concrete (a+b+c)		
(p)	Height upto 5m	cum	5970.00
(q)	Height 5m to 10m	cum	6227.00
(r)	Height above 10m	cum	6485.00
(ii)	For I-beam & slab including launching of precast girders by launching truss upto 40 m span, 21-31% of cost of concrete.		
(p)	Height upto 5m	cum	6227.00
(q)	Height 5m to 10m	cum	6485.00
(r)	Height above 10m	cum	6742.00
(iii)	For cast-in-situ box girder, segmental construction and balanced cantilever, 36-56% of cost of concrete.		
(p)	Height upto 5m	cum	6999.00
(q)	Height 5m to 10m	cum	7514.00
(r)	Height above 10m	cum	8029.00
G	PSC Grade M-50		
(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55% of cost of concrete		
(p)	Height upto 5m	cum	7209.00
(q)	Height 5m to 10m	cum	7743.00
(r)	Height above 10m	cum	8277.00
H	PSC Grade M- 55		
(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55% of cost of concrete		
(p)	Height upto 5m	cum	7619.00
(q)	Height 5m to 10m	cum	8183.00
(r)	Height above 10m	cum	8748.00
14.2	a) Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications	tonne	64377.00
14.3	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	tonne	126113.00
14.4	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications	cum	9211.00
14.5	<b>Mastic Asphalt</b> (Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.)	sqm	276.00
14.6	<b>Construction of precast RCC railing of M30 Grade, aggregate size not exceeding 12 mm, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications.</b>	metre	1625.00

### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
14.7	<b>Construction of RCC railing of M30 Grade in-situ with 20 mm nominal size aggregate, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications.</b>	metre	1574.00
14.8	<b>Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification</b>	metre	3055.00
14.9	<b>Drainage Spouts complete as per drawing and Technical specification</b>	each	856.00
14.10	<b>PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification</b>	cum	3700.00
14.11	<b>Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification</b>	cum	7632.00
14.12	<b>Providing anti-corrosive treatment to HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC) (To be taken as per the prevailing market rates.)</b>	tonne	VALUE
14.13	<b>Precast - pretensioned Girders (Providing, precasting, transportation and placing in position precast pretensioned concrete girders as per drawing and technical specifications.)</b>	cum	#VALUE!
14.14	<b>Providing and fixing Helical pipes in voided concrete slabs</b>	metre	#VALUE!
14.15	<b>Crash Barriers (The rate analysis for rigid crash barrier in reinforced cement concrete, semi-rigid crash barrier with metal beam and flexible crash barrier with wire ropes have been made and included in chapter-8 on Traffic and Transportation.)</b>	metre	VALUE
14.16	<b>Painting on concrete surface (Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface of dirt, dust, oil, grease, efflorescence and applying paint @ of 1 litre for 2 Sq.m. )</b>	metre	96.00
14.17	<b>Burried Joint (Providing and laying a burried expansion joint, expansion gap being 20 mm, covered with 12 mm thick, 200 mm wide galvanised weldable structural steel plate as per IS: 2062, placed symmetrical to centre line of the joint, resting freely over the top surface of the deck concrete, welding of 8 mm dia. 100 mm long galvanised nails spaced 300 mm c/c along the centre line of the plate, all as specified in clause 2604.)</b>	metre	936.00
14.18	<b>Filler joint</b>		
(i)	<b>Providing &amp; fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing &amp; Technical Specification.</b>	metre	4584.00
(ii)	<b>Providing &amp; fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing &amp; Technical Specification.</b>	metre	336.00
(iii)	<b>Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.</b>	metre	385.00
(iv)	<b>Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight.</b>	metre	22.30
14.19	<b>Asphaltic Plug joint (Providing and laying of asphaltic plug joint to provide for horizontal movement of 25 mm and vertical movement of 2 mm, depth of joint varying from 75 mm to 100 mm, width varying from 500 mm to 750 mm (in traffic direction), covered with a closure plate of 200mm x 6mm of weldable structural steel conforming to IS: 2062, asphaltic plug to consist of polymer modified bitumen binder, carefully selected single size aggregate of 12.5 mm nominal size and a heat resistant foam caulking/backer rod, all as per approved drawings and specifications.)</b>	metre	985.00
14.20	<b>Elastomeric Slab Steel Expansion Joint (Providing and laying of an elastomeric slab steel expansion joint, catering to right or skew (less than 20 deg., moderately curved with maximum horizontal movement upto 50 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation and clause 2606 of MoRTH specifications for road &amp; bridge works.)</b>	metre	36211.00
14.21	<b>Compression Seal Joint (Providing and laying of compression seal joint consisting of steel armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or closed cell foam joint sealer compressed and fixed into the joint gap with special adhesive binder to cater for a horizontal movement upto 40 mm and vertical movement of 3 mm.)</b>	metre	#VALUE!
14.22	<b>Strip Seal Expansion Joint (Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.)</b>	metre	11260.00
14.23	<b>Modular Strip / Box Seal Joint (Providing and laying of a modular strip Box steel expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.)</b>	metre	38000.00

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### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
14.24	<b>Modular Strip / Box Seal Joint</b> (Providing and laying of a modular strip box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.)	metre	#VALUE!

  
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Analysis of Rates  
CHAPTER - 14  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
14.1	1500 & 1600 1700		Furnishing and Placing Reinforced/ Prestressed cement concrete in super-structure as per drawing and Technical Specification					
		A	RCC Grade M20					
		Case I	Using Concrete Mixer					
			Unit = 1 cum					
			Taking output = 15 cum					
		a)	Material					
			Cement	tonne	5.12	5156.00	26398.72	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
		b)	Labour					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
		c)	Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>		<b>44934.00</b>			
			For formwork and staging add the following:					
14.1A Case I		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				44934.00	
		d)	Formwork and staging 20 per cent of (a+b+c)		20.00		8986.80	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				11323.37	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				6524.42	
			Cost for 15 cum = a+b+c+d+e+f				71768.58	
			Rate per cum = (a+b+c+d+e+f)/15				4784.57	
						say	<b>4785.00</b>	
14.1A Case I (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				44934.00	
		d)	Formwork and staging 25 per cent of (a+b+c)		25.00		11233.50	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				11795.18	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				6796.27	
			Cost for 15 cum = a+b+c+d+e+f				74758.94	
			Rate per cum = (a+b+c+d+e+f)/15				4983.93	
						say	<b>4984.00</b>	
14.1A Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				44934.00	
		d)	Formwork and staging 30 per cent of (a+b+c)		30.00		13480.20	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				12266.98	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				7068.12	
			Cost for 15 cum = a+b+c+d+e+f				77749.30	
			Rate per cum = (a+b+c+d+e+f)/15				5183.29	
						say	<b>5183.00</b>	
14.1A Case I		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					

Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				44934.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		11233.50	
			e) Overhead charges @ 0.21 on (a+b+c+d)				11795.18	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6796.27	
			Cost for 15 cum = a+b+c+d+e+f				74758.94	
			Rate per cum = (a+b+c+d+e+f)/15				4983.93	
						say	<u>4984.00</u>	
14.1A Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				44934.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		13480.20	
			e) Overhead charges @ 0.21 on (a+b+c+d)				12266.98	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7068.12	
			Cost for 15 cum = a+b+c+d+e+f				77749.30	
			Rate per cum = (a+b+c+d+e+f)/15				5183.29	
						say	<u>5183.00</u>	
14.1A Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				44934.00	
			d) Formwork and staging 35 per cent of (a+b+c)		35.00		15726.90	
			e) Overhead charges @ 0.21 on (a+b+c+d)				12738.79	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7339.97	
			Cost for 15 cum = a+b+c+d+e+f				80739.66	
			Rate per cum = (a+b+c+d+e+f)/15				5382.64	
						say	<u>5383.00</u>	
14.1A		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	40.92	5156.00	210983.52	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			b) Labour					
			Mate	day	0.84	272.00	228.48	L-12
			Mason	day	3.00	345.00	1035.00	L-11
			Mazdoor	day	18.00	257.00	4626.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1398.00	20970.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	Lead = 1 km & P&M-050
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		349487.00			
			For formwork and staging add the following:					
14.1A Case II		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
		(p)	Height upto 5m					

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Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				349487.00	
			d) Formwork and staging 20 per cent of (a+b+c)		20.00		69897.40	
			e) Overhead charges @ 0.21 on (a+b+c+d)				88070.72	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				50745.51	
			Cost for 120 cum = a+b+c+d+e+f				558200.64	
			Rate per cum = (a+b+c+d+e+f)/120				4651.67	
						say	<u>4652.00</u>	
14.1A Case II (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				349487.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		87371.75	
			e) Overhead charges @ 0.21 on (a+b+c+d)				91740.34	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				52859.91	
			Cost for 120 cum = a+b+c+d+e+f				581459.00	
			Rate per cum = (a+b+c+d+e+f)/120				4845.49	
						say	<u>4845.00</u>	
14.1A Case II (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				349487.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		104846.10	
			e) Overhead charges @ 0.21 on (a+b+c+d)				95409.95	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				54974.31	
			Cost for 120 cum = a+b+c+d+e+f				604717.36	
			Rate per cum = (a+b+c+d+e+f)/120				5039.31	
						say	<u>5039.00</u>	
14.1A Case II		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				349487.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		87371.75	
			e) Overhead charges @ 0.21 on (a+b+c+d)				91740.34	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				52859.91	
			Cost for 120 cum = a+b+c+d+e+f				581459.00	
			Rate per cum = (a+b+c+d+e+f)/120				4845.49	
						say	<u>4845.00</u>	
14.1A Case II (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				349487.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		104846.10	
			e) Overhead charges @ 0.21 on (a+b+c+d)				95409.95	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				54974.31	
			Cost for 120 cum = a+b+c+d+e+f				604717.36	
			Rate per cum = (a+b+c+d+e+f)/120				5039.31	
						say	<u>5039.00</u>	
14.1A Case II (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				349487.00	
			d) Formwork and staging 35 per cent of (a+b+c)		35.00		122320.45	
			e) Overhead charges @ 0.21 on (a+b+c+d)				99079.56	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				57088.70	
			Cost for 120 cum = a+b+c+d+e+f				627975.72	

Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Rate per cum = (a+b+c+d+e+f)/120				5233.13	
						say	<u>5233.00</u>	
14.1		B	RCC Grade M25					
		Case I	Using Concrete Mixer					
			Unit = 1 cum					
			Taking output = 15 cum					
		a)	Material					
			Cement	tonne	5.99	5156.00	30884.44	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
		b)	Labour					
			Mate	day	0.86	272.00	233.92	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
		c)	Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum		49420.00			
			For formwork and staging add the following:					
14.1B		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
Case I		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49420.00	
		d)	Formwork and staging 20 per cent of (a+b+c)		20.00		9884.00	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				12453.84	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				7175.78	
			Cost for 15 cum = a+b+c+d+e+f				78933.62	
			Rate per cum = (a+b+c+d+e+f)/15				5262.24	
						say	<u>5262.00</u>	
14.1B		(q)	Height 5m to 10m					
Case I (i)			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49420.00	
		d)	Formwork and staging 25 per cent of (a+b+c)		25.00		12355.00	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				12972.75	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				7474.78	
			Cost for 15 cum = a+b+c+d+e+f				82222.53	
			Rate per cum = (a+b+c+d+e+f)/15				5481.50	
						say	<u>5482.00</u>	
14.1B		(r)	Height above 10m					
Case I (i)			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49420.00	
		d)	Formwork and staging 30 per cent of (a+b+c)		30.00		14826.00	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				13491.66	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				7773.77	
			Cost for 15 cum = a+b+c+d+e+f				85511.43	
			Rate per cum = (a+b+c+d+e+f)/15				5700.76	
						say	<u>5701.00</u>	
14.1B		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
Case I		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49420.00	

Calc. 12/8/19

Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		d) Formwork and staging 25 per cent of (a+b+c)		25.00		12355.00	
		e) Overhead charges @ 0.21 on (a+b+c+d)				12972.75	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7474.78	
		Cost for 15 cum = a+b+c+d+e+f				82222.53	
		Rate per cum = (a+b+c+d+e+f)/15				5481.50	
					say	<u>5482.00</u>	
14.1B Case I (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49420.00	
		d) Formwork and staging 30 per cent of (a+b+c)		30.00		14826.00	
		e) Overhead charges @ 0.21 on (a+b+c+d)				13491.66	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7773.77	
		Cost for 15 cum = a+b+c+d+e+f				85511.43	
		Rate per cum = (a+b+c+d+e+f)/15				5700.76	
					say	<u>5701.00</u>	
14.1B Case I (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49420.00	
		d) Formwork and staging 35 per cent of (a+b+c)		35.00		17297.00	
		e) Overhead charges @ 0.21 on (a+b+c+d)				14010.57	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8072.76	
		Cost for 15 cum = a+b+c+d+e+f				88800.33	
		Rate per cum = (a+b+c+d+e+f)/15				5920.02	
					say	<u>5920.00</u>	
14.1B	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	tonne	47.95	5156.00	247230.20	M-081
		Coarse sand	cum	54.20	150.80	8173.36	M-004
		20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
		10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
		b) Labour					
		Mate	day	0.84	272.00	228.48	L-12
		Mason	day	3.00	345.00	1035.00	L-11
		Mazdoor	day	18.00	257.00	4626.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
		Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
		Loader	hour	6.00	1373.00	8238.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1398.00	20970.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	Lead =1 km & P&M-050
		Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		385764.00			
		For formwork and staging add the following:					
14.1B Case II	(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				385764.00	

Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		d) Formwork and staging 20 per cent of (a+b+c)		20.00		77152.80	
		e) Overhead charges @ 0.21 on (a+b+c+d)				97212.53	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				56012.93	
		Cost for 120 cum = a+b+c+d+e+f				616142.26	
		Rate per cum = (a+b+c+d+e+f)/120				5134.52	
					say	<u>5135.00</u>	
14.1B Case II (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				385764.00	
		d) Formwork and staging 25 per cent of (a+b+c)		25.00		96441.00	
		e) Overhead charges @ 0.21 on (a+b+c+d)				101263.05	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				58346.81	
		Cost for 120 cum = a+b+c+d+e+f				641814.86	
		Rate per cum = (a+b+c+d+e+f)/120				5348.46	
					say	<u>5348.00</u>	
14.1B Case II (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				385764.00	
		d) Formwork and staging 30 per cent of (a+b+c)		30.00		115729.20	
		e) Overhead charges @ 0.21 on (a+b+c+d)				105313.57	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				60680.68	
		Cost for 120 cum = a+b+c+d+e+f				667487.45	
		Rate per cum = (a+b+c+d+e+f)/120				5562.40	
					say	<u>5562.00</u>	
14.1B Case II	(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				385764.00	
		d) Formwork and staging 25 per cent of (a+b+c)		25.00		96441.00	
		e) Overhead charges @ 0.21 on (a+b+c+d)				101263.05	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				58346.81	
		Cost for 120 cum = a+b+c+d+e+f				641814.86	
		Rate per cum = (a+b+c+d+e+f)/120				5348.46	
					say	<u>5348.00</u>	
14.1B Case II (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				385764.00	
		d) Formwork and staging 30 per cent of (a+b+c)		30.00		115729.20	
		e) Overhead charges @ 0.21 on (a+b+c+d)				105313.57	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				60680.68	
		Cost for 120 cum = a+b+c+d+e+f				667487.45	
		Rate per cum = (a+b+c+d+e+f)/120				5562.40	
					say	<u>5562.00</u>	
14.1B Case II (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				385764.00	
		d) Formwork and staging 35 per cent of (a+b+c)		35.00		135017.40	
		e) Overhead charges @ 0.21 on (a+b+c+d)				109364.09	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				63014.55	
		Cost for 120 cum = a+b+c+d+e+f				693160.04	
		Rate per cum = (a+b+c+d+e+f)/120				5776.33	
					say	<u>5776.00</u>	

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Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
14.1		C	RCC Grade M 30					
		Case I	Using Concrete Mixer					
			Unit = 1 cum					
			Taking output = 15 cum					
		a)	Material					
			Cement	tonne	6.10	5156.00	31451.60	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
		b)	Labour					
			Mate	day	0.90	272.00	244.80	L-12
			Mason	day	1.50	345.00	517.50	L-11
			Mazdoor	day	21.00	257.00	5397.00	L-13
		c)	Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>		<b>50255.00</b>			
			For formwork and staging add the following:					
14.1C		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
Case I		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				50255.00	
		d)	Formwork and staging 20 per cent of (a+b+c)		20.00		10051.00	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				12664.26	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				7297.03	
			Cost for 15 cum = a+b+c+d+e+f				80267.29	
			Rate per cum = (a+b+c+d+e+f)/15				5351.15	
						say	<b>5351.00</b>	
14.1C		(q)	Height 5m to 10m					
Case I (i)			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				50255.00	
		d)	Formwork and staging 25 per cent of (a+b+c)		25.00		12563.75	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				13191.94	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				7601.07	
			Cost for 15 cum = a+b+c+d+e+f				83611.76	
			Rate per cum = (a+b+c+d+e+f)/15				5574.12	
						say	<b>5574.00</b>	
14.1C		(r)	Height above 10m					
Case I (i)			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				50255.00	
		d)	Formwork and staging 30 per cent of (a+b+c)		30.00		15076.50	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				13719.62	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				7905.11	
			Cost for 15 cum = a+b+c+d+e+f				86956.23	
			Rate per cum = (a+b+c+d+e+f)/15				5797.08	
						say	<b>5797.00</b>	
14.1C		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
Case I		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				50255.00	
		d)	Formwork and staging 25 per cent of (a+b+c)		25.00		12563.75	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				13191.94	



Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7601.07	
		Cost for 15 cum = a+b+c+d+e+f				83611.76	
		Rate per cum = (a+b+c+d+e+f)/15				5574.12	
					say	<u>5574.00</u>	
14.1C Case I (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				50255.00	
		d) Formwork and staging 30 per cent of (a+b+c)		30.00		15076.50	
		e) Overhead charges @ 0.21 on (a+b+c+d)				13719.62	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7905.11	
		Cost for 15 cum = a+b+c+d+e+f				86956.23	
		Rate per cum = (a+b+c+d+e+f)/15				5797.08	
					say	<u>5797.00</u>	
14.1C Case I (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				50255.00	
		d) Formwork and staging 35 per cent of (a+b+c)		35.00		17589.25	
		e) Overhead charges @ 0.21 on (a+b+c+d)				14247.29	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8209.15	
		Cost for 15 cum = a+b+c+d+e+f				90300.70	
		Rate per cum = (a+b+c+d+e+f)/15				6020.05	
					say	<u>6020.00</u>	
14.1C	Case II	Using Batching Plant, Transit Mixer and Concrete Pump.					
		Unit = cum					
		Taking output = 120 cum					
		a) Material					
		Cement	tonne	48.79	5156.00	251561.24	M-081
		Coarse sand	cum	54.60	150.80	8233.68	M-004
		20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
		10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
		b) Labour					
		Mate	day	0.88	272.00	239.36	L-12
		Mason	day	3.00	345.00	1035.00	L-11
		Mazdoor	day	19.00	257.00	4883.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
		Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
		Loader	hour	6.00	1373.00	8238.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1398.00	20970.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	Lead = 1 km & P&M-050
		Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		390424.00			
		For formwork and staging add the following:					
14.1C Case II	(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				390424.00	
		d) Formwork and staging 20 per cent of (a+b+c)		20.00		78084.80	
		e) Overhead charges @ 0.21 on (a+b+c+d)				98386.85	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				56689.56	

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Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Cost for 120 cum = a+b+c+d+e+f				623585.21	
			Rate per cum = (a+b+c+d+e+f)/120				5196.54	
						say	<u>5197.00</u>	
14.1C Case II (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				390424.00	
		d)	Formwork and staging 25 per cent of (a+b+c)		25.00		97606.00	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				102486.30	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				59051.63	
			Cost for 120 cum = a+b+c+d+e+f				649567.93	
			Rate per cum = (a+b+c+d+e+f)/120				5413.07	
						say	<u>5413.00</u>	
14.1C Case II (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				390424.00	
		d)	Formwork and staging 30 per cent of (a+b+c)		30.00		117127.20	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				106585.75	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				61413.70	
			Cost for 120 cum = a+b+c+d+e+f				675550.65	
			Rate per cum = (a+b+c+d+e+f)/120				5629.59	
						say	<u>5630.00</u>	
14.1C Case II		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				390424.00	
		d)	Formwork and staging 25 per cent of (a+b+c)		25.00		97606.00	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				102486.30	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				59051.63	
			Cost for 120 cum = a+b+c+d+e+f				649567.93	
			Rate per cum = (a+b+c+d+e+f)/120				5413.07	
						say	<u>5413.00</u>	
14.1C Case II (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				390424.00	
		d)	Formwork and staging 30 per cent of (a+b+c)		30.00		117127.20	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				106585.75	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				61413.70	
			Cost for 120 cum = a+b+c+d+e+f				675550.65	
			Rate per cum = (a+b+c+d+e+f)/120				5629.59	
						say	<u>5630.00</u>	
14.1C Case II (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				390424.00	
		d)	Formwork and staging 35 per cent of (a+b+c)		35.00		136648.40	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				110685.20	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				63775.76	
			Cost for 120 cum = a+b+c+d+e+f				701533.36	
			Rate per cum = (a+b+c+d+e+f)/120				5846.11	
						say	<u>5846.00</u>	
14.1		D	RCC/PSC Grade M35					
		Case I	Using Concrete Mixer.					
			Unit = 1 cum					

Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Taking output = 15 cum</b>					
		<b>a) Material</b>					
		Cement	tonne	6.33	5156.00	32637.48	M-081
		Coarse sand	cum	6.75	150.80	1017.90	M-005
		20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
		10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
		<b>b) Labour</b>					
		Mate	day	0.90	272.00	244.80	L-12
		Mason	day	1.50	345.00	517.50	L-11
		Mazdoor	day	21.00	257.00	5397.00	L-13
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
		Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>		<b>51441.00</b>			
		<b>For formwork and staging add the following:</b>					
14.1D Case I	(i)	For solid slab super-structure, 18-28 per cent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				51441.00	
		d) Formwork and staging 18 per cent of (a+b+c)		18.00		9259.38	
		e) Overhead charges @ 0.21 on (a+b+c+d)				12747.08	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7344.75	
		Cost for 15 cum = a+b+c+d+e+f				80792.21	
		Rate per cum = (a+b+c+d+e+f)/15				5386.15	
					say	<u>5386.00</u>	
14.1D Case I (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				51441.00	
		d) Formwork and staging 23 per cent of (a+b+c)		23.00		11831.43	
		e) Overhead charges @ 0.21 on (a+b+c+d)				13287.21	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7655.96	
		Cost for 15 cum = a+b+c+d+e+f				84215.60	
		Rate per cum = (a+b+c+d+e+f)/15				5614.37	
					say	<u>5614.00</u>	
14.1D Case I (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				51441.00	
		d) Formwork and staging 28 per cent of (a+b+c)		28.00		14403.48	
		e) Overhead charges @ 0.21 on (a+b+c+d)				13827.34	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7967.18	
		Cost for 15 cum = a+b+c+d+e+f				87639.00	
		Rate per cum = (a+b+c+d+e+f)/15				5842.60	
					say	<u>5843.00</u>	
14.1D Case I	(ii)	For T-beam & slab, 23-33 per cent of (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				51441.00	
		d) Formwork and staging 23 per cent of (a+b+c)		23.00		11831.43	
		e) Overhead charges @ 0.21 on (a+b+c+d)				13287.21	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7655.96	
		Cost for 15 cum = a+b+c+d+e+f				84215.60	

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Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Rate per cum = (a+b+c+d+e+f)/15				5614.37	
					say	<u>5614.00</u>	
14.1D Case I (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				51441.00	
		d) Formwork and staging 28 per cent of (a+b+c)		28.00		14403.48	
		e) Overhead charges @ 0.21 on (a+b+c+d)				13827.34	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7967.18	
		Cost for 15 cum = a+b+c+d+e+f				87639.00	
		Rate per cum = (a+b+c+d+e+f)/15				5842.60	
					say	<u>5843.00</u>	
14.1D Case I (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				51441.00	
		d) Formwork and staging 33 per cent of (a+b+c)		33.00		16975.53	
		e) Overhead charges @ 0.21 on (a+b+c+d)				14367.47	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8278.40	
		Cost for 15 cum = a+b+c+d+e+f				91062.40	
		Rate per cum = (a+b+c+d+e+f)/15				6070.83	
					say	<u>6071.00</u>	
14.1D Case I	(iii)	For box girder and balanced cantilever, 38-58 per cent of cost of concrete.					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				51441.00	
		d) Formwork and staging 38 per cent of (a+b+c)		38.00		19547.58	
		e) Overhead charges @ 0.21 on (a+b+c+d)				14907.60	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8589.62	
		Cost for 15 cum = a+b+c+d+e+f				94485.80	
		Rate per cum = (a+b+c+d+e+f)/15				6299.05	
					say	<u>6299.00</u>	
14.1D Case I (iii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				51441.00	
		d) Formwork and staging 48 per cent of (a+b+c)		48.00		24691.68	
		e) Overhead charges @ 0.21 on (a+b+c+d)				15987.86	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				9212.05	
		Cost for 15 cum = a+b+c+d+e+f				101332.60	
		Rate per cum = (a+b+c+d+e+f)/15				6755.51	
					say	<u>6756.00</u>	
14.1D Case I (iii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				51441.00	
		d) Formwork and staging 58 per cent of (a+b+c)		58.00		29835.78	
		e) Overhead charges @ 0.21 on (a+b+c+d)				17068.12	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				9834.49	
		Cost for 15 cum = a+b+c+d+e+f				108179.39	
		Rate per cum = (a+b+c+d+e+f)/15				7211.96	
					say	<u>7212.00</u>	
	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		Unit = cum					
		Taking output = 120 cum					

Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>a) Material</b>					
		Cement	tonne	50.64	5156.00	261099.84	M-081
		Coarse sand	cum	54.00	150.80	8143.20	M-004
		20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
		10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
		<b>b) Labour</b>					
		Mate	day	0.88	272.00	239.36	L-12
		Mason	day	3.00	345.00	1035.00	L-11
		Mazdoor	day	19.00	257.00	4883.00	L-13
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
		Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
		Loader	hour	6.00	1373.00	8238.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1398.00	20970.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	Lead =1 km & P&M-050
		Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>399872.00</b>			
		<b>For formwork and staging add the following:</b>					
14.1D Case II	(i)	<b>For solid slab super-structure, 18-28 per cent of (a+b+c)</b>					
	(p)	<b>Height upto 5m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				399872.00	
		<b>d) Formwork and staging 18 per cent of (a+b+c)</b>		18.00		71976.96	
		<b>e) Overhead charges @ 0.21 on (a+b+c+d)</b>				99088.28	
		<b>f) Contractor's profit @ 0.1 on (a+b+c+d+e)</b>				57093.72	
		Cost for 120 cum = a+b+c+d+e+f				628030.97	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				5233.59	
					<b>say</b>	<b>5234.00</b>	
14.1D Case II (i)	(q)	<b>Height 5m to 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				399872.00	
		<b>d) Formwork and staging 23 per cent of (a+b+c)</b>		23.00		91970.56	
		<b>e) Overhead charges @ 0.21 on (a+b+c+d)</b>				103286.94	
		<b>f) Contractor's profit @ 0.1 on (a+b+c+d+e)</b>				59512.95	
		Cost for 120 cum = a+b+c+d+e+f				654642.45	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				5455.35	
					<b>say</b>	<b>5455.00</b>	
14.1D Case II (i)	(r)	<b>Height above 10m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				399872.00	
		<b>d) Formwork and staging 28 per cent of (a+b+c)</b>		28.00		111964.16	
		<b>e) Overhead charges @ 0.21 on (a+b+c+d)</b>				107485.59	
		<b>f) Contractor's profit @ 0.1 on (a+b+c+d+e)</b>				61932.18	
		Cost for 120 cum = a+b+c+d+e+f				681253.93	
		<b>Rate per cum = (a+b+c+d+e+f)/120</b>				5677.12	
					<b>say</b>	<b>5677.00</b>	
14.1D Case II	(ii)	<b>For T-beam &amp; slab, 23-33 per cent of (a+b+c)</b>					
	(p)	<b>Height upto 5m</b>					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				399872.00	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		d) Formwork and staging 23 per cent of (a+b+c)		23.00		91970.56	
		e) Overhead charges @ 0.21 on (a+b+c+d)				103286.94	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				59512.95	
		Cost for 120 cum = a+b+c+d+e+f				654642.45	
		Rate per cum = (a+b+c+d+e+f)/120				5455.35	
					say	<u>5455.00</u>	
14.1D Case II (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				399872.00	
		d) Formwork and staging 28 per cent of (a+b+c)		28.00		111964.16	
		e) Overhead charges @ 0.21 on (a+b+c+d)				107485.59	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				61932.18	
		Cost for 120 cum = a+b+c+d+e+f				681253.93	
		Rate per cum = (a+b+c+d+e+f)/120				5677.12	
					say	<u>5677.00</u>	
14.1D Case II (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				399872.00	
		d) Formwork and staging 33 per cent of (a+b+c)		33.00		131957.76	
		e) Overhead charges @ 0.21 on (a+b+c+d)				111684.25	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				64351.40	
		Cost for 120 cum = a+b+c+d+e+f				707865.41	
		Rate per cum = (a+b+c+d+e+f)/120				5898.88	
					say	<u>5899.00</u>	
14.1D Case II	(iii)	For box girder and balanced cantilever, 38-58 per cent of cost of concrete.					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				399872.00	
		d) Formwork and staging 38 per cent of (a+b+c)		38.00		151951.36	
		e) Overhead charges @ 0.21 on (a+b+c+d)				115882.91	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				66770.63	
		Cost for 120 cum = a+b+c+d+e+f				734476.89	
		Rate per cum = (a+b+c+d+e+f)/120				6120.64	
					say	<u>6121.00</u>	
14.1D Case II (iii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				399872.00	
		d) Formwork and staging 48 per cent of (a+b+c)		48.00		191938.56	
		e) Overhead charges @ 0.21 on (a+b+c+d)				124280.22	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				71609.08	
		Cost for 120 cum = a+b+c+d+e+f				787699.86	
		Rate per cum = (a+b+c+d+e+f)/120				6564.17	
					say	<u>6564.00</u>	
14.1D Case II (iii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				399872.00	
		d) Formwork and staging 58 per cent of (a+b+c)		58.00		231925.76	
		e) Overhead charges @ 0.21 on (a+b+c+d)				132677.53	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				76447.53	
		Cost for 120 cum = a+b+c+d+e+f				840922.82	

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Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Rate per cum = (a+b+c+d+e+f)/120				7007.69	
						say	<u>7008.00</u>	
14.1		E	PSC Grade M-40					
		Case 1	Using concrete mixer.					
			Unit = 1 cum					
			Taking output = 15 cum					
			a) Material					
			Cement	tonne	6.45	5156.00	33256.20	M-081
			Coarse sand	cum	6.75	150.80	1017.90	M-005
			20 mm Aggregate	cum	8.10	550.85	4461.89	M-053
			10 mm Aggregate	cum	5.40	614.17	3316.52	M-051
			Admixture @ 0.4 per cent of cement	kg	25.80	166.14	4286.41	M-180
			b) Labour					
			Mate	day	0.96	272.00	261.12	L-12
			Mason	day	2.00	345.00	690.00	L-11
			Mazdoor	day	22.00	257.00	5654.00	L-13
			c) Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	82.30	493.80	P&M-009
			Generator 33 KVA	hour	6.00	559.00	3354.00	P&M-079
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum		56792.00			
			For formwork and staging add the following:					
14.1E Case I		(i)	For solid slab super-structure, 20-30 per cent of (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				56792.00	
			d) Formwork and staging 20 per cent of (a+b+c)		20.00		11358.40	
			e) Overhead charges @ 0.21 on (a+b+c+d)				14311.58	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8246.20	
			Cost for 15 cum = a+b+c+d+e+f				90708.18	
			Rate per cum = (a+b+c+d+e+f)/15				6047.21	
						say	<u>6047.00</u>	
14.1E Case I (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				56792.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		14198.00	
			e) Overhead charges @ 0.21 on (a+b+c+d)				14907.90	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8589.79	
			Cost for 15 cum = a+b+c+d+e+f				94487.69	
			Rate per cum = (a+b+c+d+e+f)/15				6299.18	
						say	<u>6299.00</u>	
14.1E Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				56792.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		17037.60	
			e) Overhead charges @ 0.21 on (a+b+c+d)				15504.22	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8933.38	
			Cost for 15 cum = a+b+c+d+e+f				98267.20	
			Rate per cum = (a+b+c+d+e+f)/15				6551.15	
						say	<u>6551.00</u>	
14.1E Case I		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					
		(p)	Height upto 5m					

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Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				56792.00	
			d) Formwork and staging 25 per cent of (a+b+c)		25.00		14198.00	
			e) Overhead charges @ 0.21 on (a+b+c+d)				14907.90	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8589.79	
			Cost for 15 cum = a+b+c+d+e+f				94487.69	
			Rate per cum = (a+b+c+d+e+f)/15				6299.18	
						say	<u>6299.00</u>	
14.1E Case I (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				56792.00	
			d) Formwork and staging 30 per cent of (a+b+c)		30.00		17037.60	
			e) Overhead charges @ 0.21 on (a+b+c+d)				15504.22	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8933.38	
			Cost for 15 cum = a+b+c+d+e+f				98267.20	
			Rate per cum = (a+b+c+d+e+f)/15				6551.15	
						say	<u>6551.00</u>	
14.1E Case I (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				56792.00	
			d) Formwork and staging 35 per cent of (a+b+c)		35.00		19877.20	
			e) Overhead charges @ 0.21 on (a+b+c+d)				16100.53	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				9276.97	
			Cost for 15 cum = a+b+c+d+e+f				102046.71	
			Rate per cum = (a+b+c+d+e+f)/15				6803.11	
						say	<u>6803.00</u>	
14.1E		Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
			Unit = cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	51.60	5156.00	266049.60	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			Admixture @ 0.4 per cent of cement	kg	206.40	166.14	34291.30	M-180
			b) Labour					
			Mate	day	0.94	272.00	255.68	L-12
			Mason	day	3.50	345.00	1207.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1398.00	20970.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	Lead =1 km & P&M-050
			Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum		439559.00			
			For formwork and staging add the following:					
14.1E Case II		(i)	For solid/voided slab super-structure, 18-28 per cent of (a+b+c)					
		(p)	Height upto 5m					



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Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				439559.00	
		d)	Formwork and staging 18 per cent of (a+b+c)		18.00		79120.62	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				108922.72	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				62760.23	
			Cost for 15 cum = a+b+c+d+e+f				690362.57	
			Rate per cum = (a+b+c+d+e+f)/120				5753.02	
						say	<u>5753.00</u>	
14.1E Case II (i)		(q)	Height 5m to 10m					sor
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				439559.00	
		d)	Formwork and staging 23 per cent of (a+b+c)		23.00		101098.57	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				113538.09	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				65419.57	
			Cost for 120 cum = a+b+c+d+e+f				719615.23	
			Rate per cum = (a+b+c+d+e+f)/120				5996.79	
						say	<u>5997.00</u>	
14.1E Case II (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				439559.00	
		d)	Formwork and staging 28 per cent of (a+b+c)		28.00		123076.52	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				118153.46	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				68078.90	
			Cost for 120 cum = a+b+c+d+e+f				748867.88	
			Rate per cum = (a+b+c+d+e+f)/120				6240.57	
						say	<u>6241.00</u>	
14.1E Case II		(ii)	For T-beam & slab including launching of precast girders by launching truss upto 40 m, 23-33 per cent of cost of concrete (a+b+c)					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				439559.00	
		d)	Formwork and staging 23 per cent of (a+b+c)		23.00		101098.57	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				113538.09	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				65419.57	
			Cost for 120 cum = a+b+c+d+e+f				719615.23	
			Rate per cum = (a+b+c+d+e+f)/120				5996.79	
						say	<u>5997.00</u>	
14.1E Case II (ii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				439559.00	
		d)	Formwork and staging 28 per cent of (a+b+c)		28.00		123076.52	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				118153.46	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				68078.90	
			Cost for 120 cum = a+b+c+d+e+f				748867.88	
			Rate per cum = (a+b+c+d+e+f)/120				6240.57	
						say	<u>6241.00</u>	
14.1E Case II (ii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				439559.00	
		d)	Formwork and staging 33 per cent of (a+b+c)		33.00		145054.47	
		e)	Overhead charges @ 0.21 on (a+b+c+d)				122768.83	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				70738.23	
			Cost for 120 cum = a+b+c+d+e+f				778120.53	

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Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Rate per cum = (a+b+c+d+e+f)/120				6484.34	
						say	<u>6484.00</u>	
14.1E Case II		(iii)	For cast-in-situ box girder, segment construction and balanced cantilever, 38-58 per cent of cost of concrete.					
		(p)	Height upto 5m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				439559.00	
			d) Formwork and staging 38 per cent of (a+b+c)		38.00		167032.42	
			e) Overhead charges @ 0.21 on (a+b+c+d)				127384.20	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				73397.56	
			Cost for 120 cum = a+b+c+d+e+f				807373.18	
			Rate per cum = (a+b+c+d+e+f)/120				6728.11	
						say	<u>6728.00</u>	
14.1E Case II (iii)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				439559.00	
			d) Formwork and staging 48 per cent of (a+b+c)		48.00		210988.32	
			e) Overhead charges @ 0.21 on (a+b+c+d)				136614.94	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				78716.23	
			Cost for 120 cum = a+b+c+d+e+f				865878.48	
			Rate per cum = (a+b+c+d+e+f)/120				7215.65	
						say	<u>7216.00</u>	
14.1E Case II (iii)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				439559.00	
			d) Formwork and staging 58 per cent of (a+b+c)		58.00		254944.22	
			e) Overhead charges @ 0.21 on (a+b+c+d)				145845.68	
			f) Contractor's profit @ 0.1 on (a+b+c+d+e)				84034.89	
			Cost for 120 cum = a+b+c+d+e+f				924383.79	
			Rate per cum = (a+b+c+d+e+f)/120				7703.20	
						say	<u>7703.00</u>	
14.1F		F	PSC Grade M-45					
			Unit = 1 cum					
			Taking output = 120 cum					
			a) Material					
			Cement	tonne	55.80	5156.00	287704.80	M-081
			Coarse sand	cum	54.00	150.80	8143.20	M-004
			20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
			10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
			Admixture @ 0.4 per cent of cement	kg	223.20	166.14	37082.45	M-180
			b) Labour					
			Mate	day	0.94	272.00	255.68	L-12
			Mason	day	3.50	345.00	1207.50	L-11
			Mazdoor	day	20.00	257.00	5140.00	L-13
			c) Machinery					
			Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
			Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
			Loader	hour	6.00	1373.00	8238.00	P&M-017
			Transit Mixer ( capacity 4.0 cu.m )					
			Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1398.00	20970.00	P&M-049
			Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	Lead = 1 km & P&M-050

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>464005.00</b>			
		For formwork and staging add the following:					
14.1F	(i)	For solid slab/voided slab super-structure, 16-26 per cent of cost of concrete (a+b+c)					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				464005.00	
	d)	Formwork and staging 16 per cent of (a+b+c)		16.00		74240.80	
	e)	Overhead charges @ 0.21 on (a+b+c+d)				113031.62	
	f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				65127.74	
		Cost for 120 cum = a+b+c+d+e+f				716405.16	
		Rate per cum = (a+b+c+d+e+f)/120				5970.04	
					say	<b>5970.00</b>	
14.1F (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				464005.00	
	d)	Formwork and staging 21 per cent of (a+b+c)		21.00		97441.05	
	e)	Overhead charges @ 0.21 on (a+b+c+d)				117903.67	
	f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				67934.97	
		Cost for 120 cum = a+b+c+d+e+f				747284.69	
		Rate per cum = (a+b+c+d+e+f)/120				6227.37	
					say	<b>6227.00</b>	
14.1F (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				464005.00	
	d)	Formwork and staging 26 per cent of (a+b+c)		26.00		120641.30	
	e)	Overhead charges @ 0.21 on (a+b+c+d)				122775.72	
	f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				70742.20	
		Cost for 120 cum = a+b+c+d+e+f				778164.23	
		Rate per cum = (a+b+c+d+e+f)/120				6484.70	
					say	<b>6485.00</b>	
14.1F	(ii)	For T-beam & slab including launching of precast girders by launching truss upto 40 m span, 21-31 per cent of cost of concrete.					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				464005.00	
	d)	Formwork and staging 21 per cent of (a+b+c)		21.00		97441.05	
	e)	Overhead charges @ 0.21 on (a+b+c+d)				117903.67	
	f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				67934.97	
		Cost for 120 cum = a+b+c+d+e+f				747284.69	
		Rate per cum = (a+b+c+d+e+f)/120				6227.37	
					say	<b>6227.00</b>	
14.1F (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				464005.00	
	d)	Formwork and staging 26 per cent of (a+b+c)		26.00		120641.30	
	e)	Overhead charges @ 0.21 on (a+b+c+d)				122775.72	
	f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				70742.20	
		Cost for 120 cum = a+b+c+d+e+f				778164.23	
		Rate per cum = (a+b+c+d+e+f)/120				6484.70	
					say	<b>6485.00</b>	
14.1F (ii)	(r)	Height above 10m					

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Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				464005.00	
		d) Formwork and staging 31 per cent of (a+b+c)		31.00		143841.55	
		e) Overhead charges @ 0.21 on (a+b+c+d)				127647.78	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				73549.43	
		Cost for 120 cum = a+b+c+d+e+f				809043.76	
		Rate per cum = (a+b+c+d+e+f)/120				6742.03	
					say	<u>6742.00</u>	
14.1F	(iii)	For cast-in-situ box girder, segmental construction and balanced cantilever, 36-56 per cent of cost of concrete.					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				464005.00	
		d) Formwork and staging 36 per cent of (a+b+c)		36.00		167041.80	
		e) Overhead charges @ 0.21 on (a+b+c+d)				132519.83	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				76356.66	
		Cost for 120 cum = a+b+c+d+e+f				839923.29	
		Rate per cum = (a+b+c+d+e+f)/120				6999.36	
					say	<u>6999.00</u>	
14.1F (iii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				464005.00	
		d) Formwork and staging 46 per cent of (a+b+c)		46.00		213442.30	
		e) Overhead charges @ 0.21 on (a+b+c+d)				142263.93	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				81971.12	
		Cost for 120 cum = a+b+c+d+e+f				901682.36	
		Rate per cum = (a+b+c+d+e+f)/120				7514.02	
					say	<u>7514.00</u>	
14.1F (iii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				464005.00	
		d) Formwork and staging 56 per cent of (a+b+c)		56.00		259842.80	
		e) Overhead charges @ 0.21 on (a+b+c+d)				152008.04	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				87585.58	
		Cost for 120 cum = a+b+c+d+e+f				963441.42	
		Rate per cum = (a+b+c+d+e+f)/120				8028.68	
					say	<u>8029.00</u>	
14.1	G	PSC Grade M-50					
		Unit = 1 cum					
		Taking output = 120 cum					
		a) Material					
		Cement	tonne	58.80	5156.00	303172.80	M-081
		Coarse sand	cum	54.00	150.80	8143.20	M-004
		20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
		10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
		Admixture @ 0.4 per cent of cement	kg	235.20	166.14	39076.13	M-180
		b) Labour					
		Mate	day	0.94	272.00	255.68	L-12
		Mason	day	3.50	345.00	1207.50	L-11
		Mazdoor	day	20.00	257.00	5140.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
		Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
		Loader	hour	6.00	1373.00	8238.00	P&M-017

Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1398.00	20970.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	Lead =1 km & P&M-050
		Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>481467.00</b>			
		<b>For formwork and staging add the following:</b>					
14.1G	(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 per cent of cost of concrete					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				481467.00	
		d) Formwork and staging 35 per cent of (a+b+c)		35.00		168513.45	
		e) Overhead charges @ 0.21 on (a+b+c+d)				136495.89	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				78647.63	
		Cost for 120 cum = a+b+c+d+e+f				865123.98	
		Rate per cum = (a+b+c+d+e+f)/120				7209.37	
					say	<b>7209.00</b>	
14.1G (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				481467.00	
		d) Formwork and staging 45 per cent of (a+b+c)		45.00		216660.15	
		e) Overhead charges @ 0.21 on (a+b+c+d)				146606.70	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				84473.39	
		Cost for 120 cum = a+b+c+d+e+f				929207.24	
		Rate per cum = (a+b+c+d+e+f)/120				7743.39	
					say	<b>7743.00</b>	
14.1G (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				481467.00	
		d) Formwork and staging 55 per cent of (a+b+c)		55.00		264806.85	
		e) Overhead charges @ 0.21 on (a+b+c+d)				156717.51	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				90299.14	
		Cost for 120 cum = a+b+c+d+e+f				993290.49	
		Rate per cum = (a+b+c+d+e+f)/120				8277.42	
					say	<b>8277.00</b>	
14.1	H	PSC Grade M- 55					
		Unit = 1 cum					
		Taking output = 120 cum					
		a) Material					
		Cement	tonne	63.50	5156.00	327406.00	M-081
		Coarse sand	cum	54.00	150.80	8143.20	M-004
		20 mm Aggregate	cum	64.80	550.85	35695.08	M-053
		10 mm Aggregate	cum	43.20	614.17	26532.14	M-051
		Admixture @ 0.4 per cent of cement	kg	254.00	166.14	42199.56	M-180
		b) Labour					
		Mate	day	0.94	272.00	255.68	L-12
		Mason	day	3.50	345.00	1207.50	L-11
		Mazdoor	day	20.00	257.00	5140.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2851.00	17106.00	P&M-002
		Generator 100 KVA	hour	6.00	1923.00	11538.00	P&M-080
		Loader	hour	6.00	1373.00	8238.00	P&M-017

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Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto 1 Km	hour	15.00	1398.00	20970.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.94	2082.00	Lead =1 km & P&M-050
		Concrete Pump	hour	6.00	385.00	2310.00	P&M-007
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>508823.00</b>			
		For formwork and staging add the following:					
14.1H	(i)	For cast-in-situ box girder, segmental construction and balanced cantilever, 35-55 per cent of cost of concrete					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				508823.00	
	d)	Formwork and staging 35 per cent of (a+b+c)		35.00		178088.05	
	e)	Overhead charges @ 0.21 on (a+b+c+d)				144251.32	
	f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				83116.24	
		Cost for 120 cum = a+b+c+d+e+f				914278.61	
		Rate per cum = (a+b+c+d+e+f)/120				7618.99	
					say	<b>7619.00</b>	
14.1H (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				508823.00	
	d)	Formwork and staging 45 per cent of (a+b+c)		45.00		228970.35	
	e)	Overhead charges @ 0.21 on (a+b+c+d)				154936.60	
	f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				89273.00	
		Cost for 120 cum = a+b+c+d+e+f				982002.95	
		Rate per cum = (a+b+c+d+e+f)/120				8183.36	
					say	<b>8183.00</b>	
14.1H (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				508823.00	
	d)	Formwork and staging 55 per cent of (a+b+c)		55.00		279852.65	
	e)	Overhead charges @ 0.21 on (a+b+c+d)				165621.89	
	f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				95429.75	
		Cost for 120 cum = a+b+c+d+e+f				1049727.29	
		Rate per cum = (a+b+c+d+e+f)/120				8747.73	
					say	<b>8748.00</b>	
		<b>Note</b> 1.Where ever concrete is carried out using batching plant, transit mixer, concrete pump, admixers conforming IS: 9103 @ 0.4 per cent of weight of cement may be added for achieving desired slump of concrete.					
		2. Cement provided for various components of the super structure is for estimating purpose only. Actual quantity of cement will be as per approved mix design. Similarly, the provision for coarse and fine aggregates is for estimating purpose and the exact quantity shall be as per the mix design.					
		3. The items like needle and surface vibrators are part of minor T & P which is already covered under the overhead charges. As such these items have not been added separately in the rate analysis.					
14.2	1600	Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications					
		Unit = 1 MT					
		Taking output = 1 MT					
		a) Material					

Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		HYSD bars including 5 per cent for laps and wastage	tonne	1.05	42532.00	44658.60	M-082
		Binding wire	Kg	8.00	62.27	498.16	M-072
		<b>b) Labour for cutting, bending, tying and placing in position</b>					
		Mate	day	0.44	272.00	119.68	L-12
		Blacksmith	day	3.00	345.00	1035.00	L-02a
		Mazdoor	day	8.00	257.00	2056.00	L-13
		<b>Basic Cost of Labour &amp; Material (a+b)</b>		<b>48367.00</b>			
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				10157.16	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				5852.46	
		<b>Rate per MT = a+b+c+d</b>				64377.06	
					<b>say</b>	<b>64377.00</b>	
14.3	1800	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications <i>Unit = 1 MT</i> <i>Taking output = 0.377 MT</i>					
		Details of cost for 12T13 strand 40 m long cable (weight = 0.377 MT)					
		<b>a) Material</b>					
		H.T. Strand @ 9.42 kg/m including 2 per cent for wastage and extra length for jacking	tonne	0.385	69872.80	26901.03	M-119
		Sheathing duct ID 66 mm along with 5 per cent extra length 40 x 1.05 = 42 m.	metre	42.00	82.70	3473.40	M-165
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	2.00	45.10	90.20	M-187
		Cement for grouting including 3 per cent wastage @ 3.00 kg/m = 3 x 1.03 x 40 = 123.60 kg (say, = 125 kg)	tonne	0.125	5156.00	644.50	M-081
		Add 0.50 per cent cost of material for Spacers, Insulation tape and miscellaneous items				155.55	
		<b>b) Labour</b>					
		<b>i) For making and fixing cables, anchorages</b>					
		Mate	day	0.16	272.00	43.52	L-12
		Blacksmith	day	1.00	345.00	345.00	L-02a
		Mazdoor	day	3.00	257.00	771.00	L-13
		<b>ii) For prestressing</b>					
		Mate/Supervisor	day	0.05	272.00	13.60	L-12
		Prestressing operator / Fitter	day	0.25	351.00	87.75	L-08
		Mazdoor	day	1.00	257.00	257.00	L-13
		<b>iii) For grouting</b>					
		Mate/Supervisor	day	0.05	272.00	13.60	L-12
		Mason	day	0.25	345.00	86.25	L-11
		Mazdoor	day	1.00	257.00	257.00	L-13
		<b>c) Machinery</b>					
		Stressing jack with pump	hour	2.50	194.00	485.00	P&M-040
		Grouting pump with agitator	hour	1.00	140.04	140.04	M-111
		Generator 33 KVA.	hour	3.50	559.00	1956.50	P&M-079
		<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				7501.40	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				4322.23	
		Cost for 0.377 MT (a+b+c+d+e)				47544.56	
		<b>Rate per MT = (a+b+c+d+e)/0.377</b>				126112.90	
					<b>say</b>	<b>126113.00</b>	
		<b>Note</b> Cost of HT steel has been taken for delivery at site. Hence carriage has not been considered.					

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**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
14.4	2702	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Material					
		Cement concrete M30 Grade Refer relevant item of concrete in Item 14.1 excluding formwork	cum	1.00	3254.00	3254.00	Item 14.1(C) case II
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.075	48367.00	3627.53	Item 14.2
		b) Labour					DIR used item
		Mazdoor for cleaning deck slab concrete surface.	day	0.15	257.00	38.55	L-13
		c) Overhead charges @ 0.21 on (a+b)				1453.22	
		d) Contractor's profit @ 0.1 on (a+b+c)				837.33	
		Rate per cum (a+b+c+d)				9210.62	
					say	<u>9211.00</u>	
14.5	515 & 2702	Mastic Asphalt					
		Providing and laying 12 mm thick mastic asphalt wearing course on top of deck slab excluding prime coat with paving grade bitumen meeting the requirements given in table 500-29, prepared by using mastic cooker and laid to required level and slope after cleaning the surface, including providing antiskid surface with bitumen precoated fine grained hard stone chipping of 9.5 mm nominal size at the rate of 0.005cum per 10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surfaces not less than 100 deg. C, protruding 1 mm to 4 mm over mastic surface, all complete as per clause 515.					
		Unit = sqm					
		Taking output = 72.46 sqm (2 tonnes)/(0.869 cum) assuming a density of 2.3 tonnes/cum.					
		a) Labour					
		Mate	day	0.49	272.00	133.28	L-12
		Mazdoor	day	11.00	257.00	2827.00	L-13
		Mazdoor (Skilled)	day	1.25	325.00	406.25	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	0.06	555.00	33.30	P&M-031
		Air compressor 250 cfm	hour	0.06	481.00	28.86	P&M-001
		Mastic cooker 1 tonne capacity	hour	6.00	92.70	556.20	P&M-030
		Bitumen boiler 1500 litres capacity	hour	6.00	298.00	1788.00	P&M-005
		Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.00	546.00	546.00	P&M-053
		c) Material					
		Base mastic (without coarse aggregates) = 60 per cent					
		Coarse aggregate(3.35mm to 9.5 mm size) = 40 per cent .					
		Proportion of material required for mastic asphalt with coarse aggregates (based on mix design done by CRRI for a specific case)					
		i) Bitumen (30/40 grade ) @ 10.2 per cent by weight of mix. $2 \times 10.2/100 = 0.204$	tonne	0.204	34177.50	6972.21	M-197
		ii) Crusher stone dust @ 31.9 per cent by weight of mix = $2 \times 31.9/100 = 0.638$ tonnes = $0.638/1.625 = 0.39$	cum	0.39	97.14	37.88	M-021
		iii) Lime stone dust filler with calcium carbonate content not less than 80 per cent by weight @ 17.92 per cent by weight of mix = $2 \times 17.92/100 = 0.36$	tonne	0.36	3555.38	1279.94	M-188



Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		iv) Coarse aggregates 9.5 mm to 3.35 mm size @ 40 per cent by weight of mix = $2 \times 40/100 = 0.8$ MT = $0.8/1.456 = 0.55$	cum	0.55	614.17	337.79	M-051
		v) Pre-coated stone chips of 9.5 mm nominal size for skid resistance = $72.46 \times 0.005/10 = 0.036$	cum	0.036	590.02	21.24	M-142
		vi) Bitumen for coating of chips @ 2 per cent by weight = $0.036 \times 1.456 \times 2/100 = 0.001048$ MT = 1.05kg	kg	1.05	34.18	35.89	M-197/1000
		d) Overhead charges @ 0.21 on (a+b+c)				3150.81	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1815.46	
		Cost for 72.46 sqm = a+b+c+d+e				19970.11	
		Rate per sqm = (a+b+c+d+e)/72.46				275.60	
					say	<u>276.00</u>	
		<b>Note</b> 1.The rates for 6 mm or any other thickness may be worked out on pro-rata basis.					
		2. Where tack coat is required to be provided before laying mastic asphalt, the same is required to be measured and paid separately.					
		3.The quantities of binder, filler and aggregates are for estimating purpose. Exact quantities shall be as per mix design.					
		4.This rate analysis is based on design made by CRRRI for a specific case and is meant for estimating purposes only. Actual design is required to be done for each case.					
		5.The quantity of bitumen works out 17 per cent of the mastic asphalt blocks without aggregates and falls within the standards laid down by MoRTH Specifications.					
14.6	2703, 1500, 1600 & 1700	Construction of precast RCC railing of M30 Grade, aggregate size not exceeding 12 mm, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications.					
		Unit = 1 RM					
		Taking output = 2 x 24 m span = 48 m					
		a) Material					
		i) M30 Grade Reinforced Cement Concrete	cum	4.092	3254.00	13315.37	Item 14.1(C) case II
		No. of vertical posts = $(12 + 2)/2 = 28$ Nos., External area of vertical post $0.25 \times 0.275 = 0.069$ sqm, Concrete in Vertical posts = $0.069 \times 28 = 1.932$ cum, Hand rail in 3 tiers = $3 \times 24 = 72$ m, External area = $0.170 \times 0.175 = 0.03$ sqm, Concrete in hand rails = $0.03 \times 72 = 2.16$ cum, Total Concrete = $1.932 + 2.16 = 4.092$ cum. (Refer MoRTH SD / 202)					DIR used item
		Add 5 per cent of above cost for form work for casting in casting yard.				665.77	
		ii) HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.865	48367.00	41837.46	Item 14.2
		Refer MoRTH SD / 202.					DIR used item
		Add 5 per cent of (a) for handling and fixing of precast panels in position				2790.93	
		b) Overhead charges @ 0.21 on (a)				12308.00	
		c) Contractor's profit @ 0.1 on (a+b)				7091.75	
		Rate for 48 m (a+b+c)				78009.27	
		Rate per metre (a+b+c)/48				1625.19	
					say	<u>1625.00</u>	
		<b>Note</b> 1.Quantities of material have been adopted from standard plans of MoRTH vide drawing no. SD/202.					

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**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		2.48 m length is the total linear length adding both sides of 24 m span.					
14.7	2703, 1500, 1600 & 1700	<b>Construction of RCC railing of M30 Grade in-situ with 20 mm nominal size aggregate, true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawings and technical specifications.</b>					
		<b>Unit = 1 RM</b>					
		<b>Taking output = 2 x 24 m span = 48 m.</b>					
		<b>a) Material</b>					
		i) M30 Grade Reinforced Cement Concrete	cum	4.092	3254.00	13315.37	Item 14.1(C) case II
		No. of vertical posts = $(12 + 2)2 = 28$ Nos., External area of vertical post $0.25 \times 0.275 = 0.069$ sqm, Concrete in vehicle posts = $0.069 \times 28 = 1.932$ cum, Hand rail in 3 tiers = $3 \times 24 = 72$ m, External area = $0.170 \times 0.175 = 0.03$ sqm, Concrete in hand rails = $0.03 \times 72 = 2.16$ cum, Total Concrete = $1.932 + 2.16 = 4.092$ cum. (Refer MoRTH SD / 202).					
		Add 12 per cent of above cost for form work.				1597.84	
		ii) HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.865	48367.00	41837.46	Item 14.2
		refer MoRTH SD / 202.					
		<b>b) Overhead charges @ 0.21 on (a)</b>				11917.64	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				6866.83	
		<b>Rate for 48 m (a+b+c)</b>				75535.14	
		<b>Rate per metre (a+b+c)/48</b>				1573.65	
					<b>say</b>	<b>1574.00</b>	
		<b>Note</b> 1. Quantities of material have been adopted from standard plans of MoRTH vide drawing no. SD/202.					
		2. 48 m length is the total linear length adding both sides of 24 m span.					
14.8	2703.2 & 1900	<b>Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification</b>					
		<b>Unit = 1 RM</b>					
		<b>Taking output = 2 x 50 m span = 100 m</b>					
		<b>a) Material:</b>					
		1) ISMC 100 = $2.806 \times 1.05 = 2.946$ MT	tonne	2.946	44927.00	132354.94	M-179
		2) MS Flat = $0.964 \times 1.05 = 1.012$ MT	tonne	1.012	44927.00	45466.12	M-179
		3) MS bars = $0.17 \times 1.05 = 0.180$ MT	tonne	0.18	44927.00	8086.86	M-179
		4) MS bolts, nuts and washers	tonne	0.15	61190.00	9178.50	M-130*1000
		Add @ 5 per cent of cost of material for painting one shop coat with red oxide primer and three coats of synthetic enamel paint and consumables to safeguard against weathering and corrosion.				9754.32	
		Add for cost of concrete for fixing vertical posts in the performed recess @ 1 per cent of cost of material.				1950.86	
		Add for electricity charges, welding and drilling equipment, electrodes and other consumables @ 1 per cent of cost of material.				1950.86	
		<b>b) Labour</b>					
		Mate	day	2.80	272.00	761.60	L-12
		Mazdoor (Skilled)	day	30.00	325.00	9750.00	L-15
		Mazdoor	day	40.00	257.00	10280.00	L-13
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				48202.16	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				27773.62	

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Cost for 100 m steel railing = a+b+c+d				305509.85	
		Rate per metre (a+b+c+d)/100				3055.10	
					say	<u>3055.00</u>	
14.9	2705	Drainage Spouts complete as per drawing and Technical specification					
		Unit = 1 No.					
		Taking output = 1 No.					
		a) Material					
		Corrosion resistant Structural steel including 5 per cent wastage	Kg	4.00	42.13	168.53	M-087/1000
		GI pipe 100mm dia	metre	6.00	40.75	244.50	M-056
		GI bolt 10 mm Dia	each	6.00	15.82	94.92	M-110
		Galvanised MS flat clamp	each	2.00	14.70	29.40	M-101
		b) Labour					
		For fabrication					
		Mate	day	0.02	272.00	5.44	L-12
		Skilled (Blacksmith, welder etc.)	day	0.02	345.00	6.90	L-02a
		Mazdoor	day	0.02	257.00	5.14	L-13
		For fixing in position					
		Mate	day	0.01	272.00	2.72	L-12
		Mason	day	0.01	345.00	3.45	L-11
		Mazdoor	day	0.20	257.00	51.40	L-13
		Add @ 5 per cent of cost of material and labour for electrodes, cutting gas, sealant, anti-corrosive bituminous paint, mild steel grating etc.				30.62	
		c) Overhead charges @ 0.21 on (a+b)				135.03	
		d) Contractor's profit @ 0.1 on (a+b+c)				77.81	
		Rate per No. (a+b+c+d)				855.86	
					say	<u>856.00</u>	
	Note	1. In case of viaducts in urban areas, the drainage spouts should be connected with suitably located pipelines to discharge the surface run-off to drains provided at ground level.					
		2. In case of bridges, sufficient length of G.I Pipe shall be provided to ensure that there is no splashing of water from the drainage spout on the structure.					
14.10	2700	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Material					
		Concrete, Rate as per item No. 12.8 (A) excluding formworks	cum	1.00	2780.00	2780.00	Item 12.8 (A)
		b) Overhead charges @ 0.21 on (a)				583.80	
		c) Contractor's profit @ 0.1 on (a+b)				336.38	
		Rate per cum (a+b+c)				3700.18	
		Rate per cum			say	<u>3700.00</u>	
14.11	1500,1600,1700 & 2704	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Material					
		Cement concrete M30 Grade Refer relevant item of concrete in item 12.8(G) by using batching plant, excluding formwork i.e. per cum basic cost (a+b+c) (Excluding OH & CP)	cum	1.00	3251.00	3251.00	Item 12.8 (G) ii

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		( Refer relevant item of concrete in item No. 13.8 (G) except that form work may be added at the rate of 2 per cent of cost against 3.5 per cent provided in the foundation concrete.				65.02	
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.05	48367.00	2418.35	Item 14.2
		b) Overhead charges @ 0.21 on (a)				1204.22	
		c) Contractor's profit @ 0.1 on(a+b)				693.86	
		Rate per cum (a+b+c)				7632.45	
					say	<u>7632.00</u>	
		<b>Note</b> The grade of reinforced cement concrete may be adopted as M30 for severe conditions and M25 for moderate conditions.					
14.12	1600	Providing anti-corrosive treatment to HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC)					
		Unit = 1 MT					
		Taking output = 1 MT					
		To be taken as per the prevailing market rates.				VALUE	
		<b>Note</b> Contractors generally do not have expertise for this item . The job is therefore, got done from specialised firms who have the expertise in the field of construction chemicals. The prevailing rate in the market is required to be ascertained from the market and added in the cost estimate. Detailed guidelines in this regard have been issued by MoRTH vide their circular no. RW/NH-34041/44/91-S&R dated 21.3.2000.					
14.13	1800 & 2300	Precast - pretensioned Girders					
		Providing, precasting, transportation and placing in position precast pretensioned concrete girders as per drawing and technical specifications					
		Unit = 1 cum					
		Taking output = 1 cum					
		Grade of concrete - M40					
		a) Material					
		Cement	tonne	0.47	5156.00	2423.32	M-081
		Coarse sand	cum	0.45	150.80	67.86	M-004
		20 mm Aggregate	cum	0.54	550.85	297.46	M-053
		10 mm Aggregate	cum	0.36	614.17	221.10	M-051
		Admixture @ 0.4 per cent of cement	Kg	1.88	166.14	312.34	M-180
		HYSD steel .	tonne	0.10	42532.00	4253.20	M-082
		HT strand with 5 per cent as wastage and extra length for anchoring	tonne	0.06	69872.80	4192.37	M-119
		LDO for steam curing	Litre	37.00	input	#VALUE!	M-122
		Add consumables such as binding wire, foam, packing tape, shuttering oil, HDPE pipe for unbonding of strand, bolt & nuts etc @ 1 per cent of material cost				#VALUE!	
		b) Labour					
		(i) Cutting, bending, making reinforcement cage, placing in position, binding etc. complete					
		Taking quantity of steel 100 Kg/cum of concrete including laps and wastage					
		Mate	day	0.06	272.00	16.32	L-12
		Mazdoor (Skilled)	day	0.35	325.00	113.75	L-15
		Mazdoor	day	1.40	257.00	359.80	L-13
		(ii) Cable cutting and threading in position including binding by insulation tape with HDPE pipes etc., prestressing and cutting of extra length of HT strand after de-stressing.					
		Taking quantity of HT strand 60 Kg/cum					

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	0.02	272.00	5.44	L-12
		Mazdoor (Skilled)	day	0.14	325.00	45.50	L-15
		Mazdoor	day	0.50	257.00	128.50	L-13
		<b>(iii) Erection and dismantling of shuttering</b>					
		<b>Taking shuttering area 10 sqm/cum of concrete</b>					
		Mate	day	0.12	272.00	32.64	L-12
		Mazdoor (Skilled)	day	1.00	325.00	325.00	L-15
		Mazdoor	day	2.00	257.00	514.00	L-13
		<b>(iv) Concreting by Batching plant and stationary concrete pump</b>					
		Mate	day	0.03	272.00	8.16	L-12
		Mazdoor (Skilled)	day	0.05	325.00	16.25	L-15
		Mazdoor	day	0.60	257.00	154.20	L-13
		<b>(v) Steam curing and manual curing</b>					
		Mate	day	0.01	272.00	2.72	L-12
		Mazdoor	day	0.35	257.00	89.95	L-13
		<b>(vi) Handling of precast girder, stacking in stockyard and again loading in trailer</b>					
		Mate	day	0.01	272.00	2.72	L-12
		Mazdoor	day	0.25	257.00	64.25	L-13
		<b>(vii) Placement of girders in position over pier caps including placement of sand jacks, channel, levelling etc.</b>					
		Mate	day	0.01	272.00	2.72	L-12
		Mazdoor (Skilled)	day	0.06	325.00	19.50	L-15
		Mazdoor	day	0.24	257.00	61.68	L-13
		<b>c) Machinery</b>					
		<b>i) At casting yard</b>					
		Generator 100 KVA	hour	0.05	1923.00	96.15	P&M-080
		Batching Plant @ 20 cum/hour	hour	0.05	2851.00	142.55	P&M-002
		Transit Mixer 4 cum capacity	hour	0.10	1398.00	139.80	P&M-049
		Concrete Pump stationary	hour	0.05	385.00	19.25	P&M-007
		Crane 35 tonne capacity	hour	0.10	1282.00	128.20	P&M-012
		Trailer 30 tonne capacity	hour	0.10	3730.00	373.00	P&M-089
		Loader	hour	0.05	1373.00	68.65	P&M-017
		<b>ii) For transportation and placement at site</b>					
		Crane 35 tonne capacity	hour	0.15	1282.00	192.30	P&M-012
		Trailer 30 tonne capacity for transporting to site.	tonne.km	2.5xL	3.47	8.68	Lead =1 km & P&M-090
		(L - Lead in Kilometer)					
		Trailer 30 tonne capacity during placement.	hour	0.15	3730.00	559.50	P&M-089
		Cost of formwork, steam curing arrangement, pretensioning arrangement etc @ 5 per cent of cost material, labour and machinery				#VALUE!	
		<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				#VALUE!	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				#VALUE!	
		<b>Rate per cum = (a+b+c+d+e)</b>				#VALUE!	
					<b>say</b>	<b>#VALUE!</b>	
14.14	1700 & 1800	Providing and fixing Helical pipes in voided concrete slabs					
		<b>Unit = 1 RM</b>					
		<b>Taking output = 1 RM</b>					
		<b>a) Material</b>					
		Helical pipes 600mm diameter	metre	1.00	input	#VALUE!	M-117
		Tie rods 20mm diameter	each	1.00	input	#VALUE!	M-183

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Consumables for sealing joints etc.@ 5 per cent of cost of material				#VALUE!	
		<b>b) Labour</b>					
		Mate	day	0.01	272.00	2.72	L-12
		Fitter	day	0.05	351.00	17.55	L-08
		Mazdoor	day	0.20	257.00	51.40	L-13
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				#VALUE!	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				#VALUE!	
		<b>Rate per cum (a+b+c+d)</b>				#VALUE!	
					say	#VALUE!	
14.15	800	<b>Crash Barriers</b>					
		The rate analysis for rigid crash barrier in reinforced cement concrete, semi-rigid crash barrier with metal beam and flexible crash barrier with wire ropes have been made and included in chapter-8 on Traffic and Transportation.	Per m			VALUE	
14.16	800	<b>Painting on concrete surface</b>					
		Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface of dirt, dust, oil, grease, efflorescence and applying paint @ of 1 litre for 2 sqm.					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	0.01	272.00	2.72	L-12
		Painter	day	0.25	326.00	81.50	L-18
		Mazdoor (Skilled)	day	0.25	325.00	81.25	L-15
		<b>b) Material</b>					
		Water based paint of approved quality for cement concrete surface	Litres	5.00	111.48	557.40	M-190
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				151.80	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				87.47	
		Cost for 10 sqm (a+b+c+d)				962.14	
		<b>Rate per sqm (a+b+c+d)/10</b>				96.21	
					say	<u>96.00</u>	
14.17	2604	<b>Burried Joint</b>					
		Providing and laying a burried expansion joint, expansion gap being 20 mm, covered with 12 mm thick, 200 mm wide galvanised weldable structural steel plate as per IS: 2062, placed symmetrical to centre line of the joint, resting freely over the top surface of the deck concrete, welding of 8 mm dia. 100 mm long galvanised nails spaced 300 mm c/c along the centre line of the plate, all as specified in clause 2604.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		<b>a) Labour</b>					
		Mate	day	0.02	272.00	5.44	L-12
		Mazdoor	day	0.40	257.00	102.80	L-13
		Mazdoor (Skilled)	day	0.20	325.00	65.00	L-15
		<b>b) Material</b>					
		Galvanised M.S plate 200 mm wide, 12 mm thick @ 94.20 kg/sqm including 5 per cent wastage	kg	237.50	34.46	8184.44	M-060/1000
		Add 1 per cent of cost of steel plate cutting, welding consumables and galvanised nails.				81.84	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				1772.30	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1021.18	

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Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
			Cost for 12 m = (a+b+c+d)				11233.01	
			Rate per m = (a+b+c+d)/12				936.08	
						say	<u>936.00</u>	
		<b>Note</b>	Guidelines laid down vide the MoRTH circular No. RW/NH-34059/1/96-S&R dated 30.11.2000 and subsequent corrigendum dated 25.01.2001 may be referred for expansion joints.					
14.18	2605		Filler joint					
		(i)	Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.					
			Unit = Running meter					
			Taking output = 12 m					
			a) Labour					
			Cutting, bending, carrying & fixing etc.					
			Mate	day	0.04	272.00	10.88	L-12
			Mazdoor	day	0.50	257.00	128.50	L-13
			Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
			b) Material					
			Copper plate - 12m long x 250 mm wide	kg	55.00	746.00	41030.00	M-086
			Area = 12 x 0.25 = 3 sqm					
			Weight = 3 x 0.002 x 8900 = 53.4 kg					
			Wastage @ 2.5 per cent = 1.33 kg/54.73 kg say = 55 kg.					
			c) Overhead charges @ 0.21 on (a+b)				8679.69	
			d) Contractor's profit @ 0.1 on (a+b+c)				5001.16	
			Cost for 12 m = (a+b+c+d)				55012.73	
			Rate per m = (a+b+c+d)/12				4584.39	
						say	<u>4584.00</u>	
14.18		(ii)	Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.					
			Unit = Running meter					
			Taking output = 12 m					
			a) Labour					
			For carrying, placing & fixing.					
			Mate	day	0.008	272.00	2.18	L-12
			Mazdoor	day	0.10	257.00	25.70	L-13
			Mazdoor (Skilled)	day	0.10	325.00	32.50	L-15
			b) Material					
			20 mm thick compressible fibre board 12 m long x 25 cm deep.	sqm	3.00	988.42	2965.26	M-084
			Area = 12 x 0.25 = 3 sqm					
			c) Overhead charges @ 0.21 on (a+b)				635.38	
			d) Contractor's profit @ 0.1 on (a+b+c)				366.10	
			Cost for 12 m = (a+b+c+d)				4027.12	
			Rate per m = (a+b+c+d)/12				335.59	
						say	<u>336.00</u>	
14.18		(iii)	Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant complete as per drawing and technical specifications.					
			Unit = Running meter					
			Taking output = 12 m					
			a) Labour					
			Mate	day	0.01	272.00	2.72	L-12

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mazdoor	day	0.20	257.00	51.40	L-13
		Mazdoor (Skilled)	day	0.10	325.00	32.50	L-15
		<b>b) Material</b>					
		Premoulded joint filler 12 m long, 20 mm thick and 300 mm deep.	sqm	3.60	939.64	3382.70	M-141
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				728.56	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				419.79	
		Cost for 12 m = (a+b+c+d)				4617.67	
		<b>Rate per m = (a+b+c+d)/12</b>				384.81	
					<b>say</b>	<b>385.00</b>	
14.18	(iv)	Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6 per cent bitumen by weight					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		12m long x 100 mm wide x 10mm deep recess					
		<b>a) Labour</b>					
		Mate	day	0.02	272.00	5.44	L-12
		Mazdoor	day	0.50	257.00	128.50	L-13
		Mazdoor (Skilled)	day	0.10	325.00	32.50	L-15
		<b>b) Material</b>					
		Sand	cum	0.012	150.80	1.81	M-005
		Volume 12 x 0.1 x 0.01 = 0.012 cum					
		Weight 0.012 x 1400 = 16.8kg					
		<b>Bitumen</b>	cum	0.001	32830.00	32.83	M-074
		16.8 x 0.06 = 1 kg					
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				42.23	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				24.33	
		Cost for 12 m = (a+b+c+d)				267.64	
		<b>Rate per m = (a+b+c+d)/12</b>				22.30	
					<b>say</b>	<b>22.30</b>	
		<b>Note</b> For arriving at the final rate of filler joints per m length and per cm depth of joint filling compound, the rates at Sl. No. i), ii), iii) & iv) shall be added					
14.19	2600	<b>Asphaltic Plug joint</b>					
		Providing and laying of asphaltic plug joint to provide for horizontal movement of 25 mm and vertical movement of 2 mm, depth of joint varying from 75 mm to 100 mm, width varying from 500 mm to 750 mm (in traffic direction), covered with a closure plate of 200mm x 6mm of weldable structural steel conforming to IS: 2062, asphaltic plug to consist of polymer modified bitumen binder, carefully selected single size aggregate of 12.5 mm nominal size and a heat resistant foam caulking/backer rod, all as per approved drawings and specifications.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		<b>a) Labour</b>					
		Mate	day	0.052	272.00	14.14	L-12
		Mazdoor	day	1.00	257.00	257.00	L-13
		Mazdoor (Skilled)	day	0.30	325.00	97.50	L-15
		<b>b) Material</b>					
		Crushed stone aggregate 12.5 mm nominal size	cum	0.75	642.67	482.00	M-052
		Polymer modified bitumen	kg	77.50	34.92	2706.30	M-078/ 1000



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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Galvanised structural steel plate 200 mm wide, 6 mm thick, 12 m long (2.4 sqm) @ 47.10 kg/sqm including 5 per cent wastage	kg	113.00	42.10	4757.30	M-103
		Add 1 per cent for welding and foam caulking/backer rod and other incidentals.				83.14	
		<b>c) Machinery</b>					
		Mastic cooker 1 tonne capacity	hour	1.00	92.70	92.70	P&M-030
		Smooth 3-wheeled steel roller 8-10 capacity	hour	0.50	781.00	390.50	P&M-044
		<b>d) Overhead charges @ 0.21 on (a+b+c)</b>				1864.92	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1074.55	
		Cost for 12 m asphalt plug joint = (a+b+c+d+e)				11820.06	
		<b>Rate per m = (a+b+c+d+e)/12</b>				985.01	
					<b>say</b>	<b>985.00</b>	
		<b>Note</b> The nominal size of aggregates shall be 12.5 mm for depth of joint upto 75 mm and 20 mm for joints of depth more than 75 mm.					
14.20	2606	<b>Elastomeric Slab Steel Expansion Joint</b>					
		Providing and laying of an elastomeric slab steel expansion joint, catering to right or skew (less than 20 deg., moderately curved with maximum horizontal movement upto 50 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation and clause 2606 of MoRTH specifications for road & bridge works.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		<b>a) Labour</b>					
		Mate	day	0.06	272.00	16.32	L-12
		Mazdoor	day	1.00	257.00	257.00	L-13
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
		<b>b) Material</b>					
		Supply of elastomeric slab seal expansion joint assembly manufactured by using chloroprene, elastomer for elastomeric slab unit conforming to clause 915.1 of IRC: 83 (part II), complete as per approved drawings and standard specification conforming to clause 2606 of MoRTH Specification	metre	12.00	25876.07	310512.84	M-093
		Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals.				15525.64	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				68559.60	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				39503.39	
		Cost for 12 m = (a+b+c+d)				434537.30	
		<b>Rate per m = (a+b+c+d)/12</b>				36211.44	
					<b>say</b>	<b>36211.00</b>	
14.21	2600	<b>Compression Seal Joint</b>					
		Providing and laying of compression seal joint consisting of steel armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or closed cell foam joint sealer compressed and fixed into the joint gap with special adhesive binder to cater for a horizontal movement upto 40 mm and vertical movement of 3 mm.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		<b>a) Labour</b>					
		Mate	day	0.036	272.00	9.79	L-12

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Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mazdoor	day	0.60	257.00	154.20	L-13
		Mazdoor (Skilled)	day	0.30	325.00	97.50	L-15
		<b>b) Material</b>					
		1. Galvanised angle sections 100mm x 100mm of 12mm thickness weldable structural steel as per IS: 2062, 2 nos. of 12 m length each @ 17.7 kg/m and 5 per cent wastage.	kg	446.00	42.10	18776.60	M-103
		Add 5 per cent of cost of above for structural steel for anchorage, welding and other incidentals.				951.90	
		Preformed continuous chloroprene elastomer or closed cell foam sealing element with high tear strength, vulcanised in a single operation for the full length of a joint to ensure water tightness.	metre	12.00	input	#VALUE!	M-143
		Add 1 per cent of cost of sealing element for lubricant-cum-adhesive and other consumables.				#VALUE!	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				#VALUE!	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				#VALUE!	
		Cost for 12 m = (a+b+c+d)				#VALUE!	
		<b>Rate per m = (a+b+c+d)/12</b>				#VALUE!	
					say	<u>#VALUE!</u>	
		<b>Note</b> 1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
		3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					
14.22	2607	<b>Strip Seal Expansion Joint</b>					
		Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		<b>a) Labour</b>					
		Mate	day	0.05	272.00	13.60	L-12
		Mazdoor	day	1.00	257.00	257.00	L-13
		Mazdoor (Skilled)	day	0.25	325.00	81.25	L-15
		<b>b) Material</b>					
		Supply of complete assembly of strip seal expansion joint comprising of edge beams, anchorage, strip seal element and complete accessories as per approved specifications and drawings.	metre	12.00	8027.80	96333.60	M-178
		Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals (a+b)				4834.27	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				21319.14	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				12283.89	
		Cost for 12 m = (a+b+c+d)				135122.75	
		<b>Rate per m = (a+b+c+d)/12</b>				11260.23	
					say	<u>11260.00</u>	
		<b>Note</b> 1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
14.23	2600	<b>Modular Strip / Box Seal Joint</b>					

Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Providing and laying of a modular strip Box seal expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.					
		Unit = Running meter					
		Taking output = 12 m					
		a) Labour					
		Mate	day	0.056	272.00	15.23	L-12
		Mazdoor	day	1.00	257.00	257.00	L-13
		Mazdoor (Skilled)	day	0.40	325.00	130.00	L-15
		b) Material					
		Supply of a modular strip/box seal joint assembly comprising of edge beams, central beam, 2 modules chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative.	metre	12.00	28516.45	342197.40	M-127
		c) Overhead charges @ 0.21 on (a+b)				71945.92	
		d) Contractor's profit @ 0.1 on (a+b+c)				41454.56	
		Cost for 12 m Modular strip/box seal joint = (a+b+c+d)				456000.11	
		Rate per m = (a+b+c+d)/12				38000.01	
					say	<u>38000.00</u>	
		Note					
		1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
		2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
		3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					
14.24	2600	Modular Strip / Box Seal Joint					
		Providing and laying of a modular strip box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm, complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.					
		Unit = Running meter					
		Taking output = 12 m					
		a) Labour					
		Mate	day	0.07	272.00	19.04	L-12
		Mazdoor	day	1.25	257.00	321.25	L-13
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
		b) Material					
		Supply of a modular box/box seal joint assembly containing 3 modules/cells and comprising of edge beams, two central beams, chloroprene seal, anchorage elements, support and control system, all steel sections protected against corrosion and installed by the manufacturer or his authorised representative.	metre	12.00	input	#VALUE!	M-128
		c) Overhead charges @ 0.21 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Cost for 12 m Modular strip/box seal joint = (a+b+c+d)				#VALUE!	
		Rate per m = (a+b+c+d)/12				#VALUE!	
					say	<u>#VALUE!</u>	

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Analysis of Rates  
**SUPER - STRUCTURE**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Note</b>	1. The installation shall be done by the manufacturer or his authorised representative to the satisfaction of the Engineer.					
			2. The concreting for joining the expansion joint assembly with the deck has not been included in this analysis as the same is catered in the quantities of RCC deck.					
			3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					

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## **CHAPTER-15**

# **RIVER TRAINING AND PROTECTION WORKS**

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## Chapter – 15

### River Training and Protection Works

#### Preamble:

1. Three types of aprons on riverbed as under have been catered.
  - a) Boulder apron laid dry
  - b) Boulder apron laid in wire crates
  - c) Apron laid in cement concrete blocks on M 15
2. A toe wall for toe protection of pitching can be either in dry rubble masonry (uncoursed) or in nominal mix cement concrete M 15. Depending upon the design, the rates may be adopted under respective clauses.
3. Flooring has been proposed in dry rubble stone, rubble stone laid in C M 1:3 and with cement concrete block M 15.
4. Curtain walls proposed are of following two types:
  - a) Course rubble stone masonry (1<sup>st</sup> sort) in C M 1:3.
  - b) Cement concrete M 15 grade.
5. The rate analysis for gabion structures comprising of stone boulders laid in wire crates have been included. Such structures are suited as retaining structures and for erosion control in river training works especially for situations where some settlement of foundation is anticipated. These structures can adjust in minor settlements, being flexible structures, without losing their functional requirement.

  
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# Summary of Rate Analysis

## CHAPTER - 15

### RIVER TRAINING AND PROTECTION WORKS

Item No.	Description	Unit	Rate (₹)
15.1	<b>Providing and laying boulders apron on river bed for protection against scour with stone boulders weighing not less than 40 kg each complete as per drawing and Technical specification.</b>		
A	<b>Boulder laid dry without wire crates.</b>	cum	917.00
15.2	<b>Boulder apron laid in wire crates</b> (Providing and laying of boulder apron laid in wire crates made with 4mm dia GI wire conforming to IS: 280 & IS:4826 in 100mm x 100mm mesh (weaved diagonally) including 10% extra for laps and joints laid with stone boulders weighing not less than 40 kg each.)	cum	1293.00
15.3	<b>Cement concrete blocks (size 0.5 x 0.5 x 0.5 m)</b> (Providing and laying of apron with cement concrete blocks of size 0.5x0.5x0.5 m cast in-situ and made with nominal mix of M-15 grade cement concrete with a minimum cement content of 250 kg/cum as per IRC: 21-2000.)	cum	3925.00
15.4	<b>Providing and laying Pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications</b>		
A	<b>Stone/Boulder</b>	cum	917.00
B	<b>Cement Concrete blocks of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15</b>	cum	3925.00
15.5	<b>Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification</b>	cum	1121.00
15.6	<b>Geotextile Filter</b> (Laying of a geotextile filter between pitching and embankment slopes on which pitching is laid to prevent escape of the embankment material through the voids of the stone pitching/cement concrete blocks as well as to allow free movement of water without creating any uplift head on the pitching.)	sqm	#VALUE!
15.7	<b>Toe protection</b> (A toe wall for toe protection can either be in dry rubble masonry in case of dry rubble pitching or pitching with stones in wire crates or it can be in PCC M15 nominal mix if cement concrete block have been used for pitching . Rates for toe wall can be adopted from respective clauses depending upon approved design. The rate for excavation for foundation, dry rubble masonry and PCC M15 have been analysed and given in respective chapters.)		-
15.8	<b>Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concrete bedding.</b>		
A	<b>Rubble stone laid in cement mortar 1:3</b>	cum	3524.00
B	<b>Cement Concrete blocks Grade M15</b>	cum	5169.00
15.9	<b>Dry rubble Flooring</b>	cum	1272.00
15.10	<b>Curtain wall complete as per drawing and Technical specification</b>		
A	<b>Stone masonry in cement mortar (1:3)</b>	cum	3083.00
B	<b>Cement concrete Grade M15</b>	cum	3848.00
15.11	<b>Flexible Apron :Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall.</b>	cum	970.00
15.12	<b>Gabian Structure for Retaining Earth</b> (Providing and construction of a gabain structure for retaining earth with segments of wire crates of size 7 m x 3 m x 0.6 m each divided into 1.5 m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be tied with 4 mm galvanised steel wire.)	cum	1315.00
15.13	<b>Gabian Structure for Erosion Control, River Training Works and Protection works</b> (Providing and constructing gabain structures for erosion control, river training works and protection works with wire crates of size 2 m x 1 m x 0.3 m each divided into 1m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS: 280 and galvanizing coating conforming to IS: 4826, woven into mesh with double twist, mesh size not exceeding 100 mm x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be securely tied with 4 mm galvanised steel wire.)	cum	2089.00

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Analysis of Rates

CHAPTER - 15

RIVER TRAINING AND PROTECTION WORKS

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
15.1	2503	Providing and laying boulders apron on river bed for protection against scour with stone boulders weighing not less than 40 kg each complete as per drawing and Technical specification.					
	A	Boulder Laid Dry Without Wire Crates					
		Unit = cum					
		Taking output = 1 cum					
		a) Material					
		Stone	cum	1.00	303.85	303.85	M-003
		Stone Spalls	cum	0.20	303.85	60.77	M-008
		b) Labour					
		Mate	day	0.04	272.00	10.88	L-12
		Mason	day	0.35	345.00	120.75	L-11
		Mazdoor *	day	0.75	257.00	192.75	L-13
		c) Overhead charges @ 0.21 on (a+b)				144.69	
		d) Contractor's profit @ 0.1 on (a+b+c)				83.37	
		Rate per cum = (a+b+c+d)				917.06	
					say	917.00	
	*	Including excavation for trimming for preparation of bed.					
	Note	Nominal excavation required for preparation of bed has been taken into account while making provision for labour.					
15.2	2503	Boulder Apron Laid in Wire Crates					
		Providing and laying of boulder apron laid in wire crates made with 4mm dia GI wire conforming to IS: 280 & IS:4826 in 100mm x 100mm mesh (weaved diagonally) including 10 per cent extra for laps and joints laid with stone boulders weighing not less than 40 kg each.					
		Unit = cum					
		Taking output = 3 mx1.5mx1.25m = 5.63 cum					
		a) Material					
		4mm GI wire crates woven in mesh size of 100 mm x 100 mm.	sqm	22.00	95.72	2105.84	M-102
		Stone	cum	5.63	303.85	1710.68	M-003
		Stone Spalls	cum	1.13	303.85	343.35	M-008
		b) Labour					
		Mate	day	0.18	272.00	48.96	L-12
		Mazdoor (Skilled)	day	1.50	325.00	487.50	L-15
		Mazdoor	day	*3.00	257.00	771.0	L-13
		c) Overhead charges @ 0.21 on (a+b)				1148.1	
		d) Contractor's profit @ 0.1 on (a+b+c)				661.55	
		Cost for 5.63 cum = a+b+c+d				7277.01	
		Rate per cum = (a+b+c+d)/5.63				1292.54	
					say	1293.00	
	*	Including excavation for trimming for preparation of bed.					
	Note	Readymade woven wire crate rolls have been considered in the rate analysis. In case readymade rolls are not available, GI wire 4mm dia. @ 32 kg per 10 sqm may be provided. In that case 2 per cent of the cost of GI wire may be added for weaving the wire crates.					
15.3	2503	Cement Concrete Blocks (size 0.5 x 0.5 x 0.5 m)					
		Providing and laying of apron with cement concrete blocks of size 0.5x0.5x0.5 m cast in-situ and made with nominal mix of M-15 grade cement concrete with a minimum cement content of 250 kg/cum as per IRC: 21-2000.					
		Unit = cum					
		Taking out put = 1 cum					
		Concrete Grade M15 Rate as per item No. 12.8 (A) including OH & CP	cum	1.00	3848.00	3848.00	Item 12.8 (A)
		Add 2 per cent of cost to account for excavation for preparation of bed, nominal surface reinforcement and filling of granular material in recesses between blocks.				76.96	
		Rate per cum				3924.96	
					say	3925.00	

Analysis of Rates  
**RIVER TRAINING AND PROTECTION WORKS**

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
15.4	2504		Providing and laying Pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical specifications					
		A	Stone/Boulder					
			Unit = cum					
			Taking output = 1 cum					
			a) Material					
			Stone weighing not less than 40kg	cum	1.00	303.85	303.85	M-003
			Stone spalls of minimum 25 mm size	cum	0.20	303.85	60.77	M-008
			b) Labour					
			Mate	day	0.04	272.00	10.88	L-12
			Mason	day	0.35	345.00	120.75	L-11
			Mazdoor	day	0.75	257.00	192.75	L-13
			c) Overhead charges @ 0.21 on (a+b)				144.69	
			d) Contractor's profit @ 0.1 on (a+b+c)				83.37	
			Rate per cum = (a+b+c+d)				917.06	
						say	917.00	
15.4		B	Cement Concrete Blocks of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15					
			Unit = cum					
			Taking output = 1 cum					
			Concrete Grade M15 Rate as per item No. 12.8 (A)	cum	1.00	3848.00	3848.00	Item 12.8 (A)
			Add 2 per cent of cost to account for nominal surface reinforcement and filling of granular material in recesses between blocks.				76.96	
			Rate per cum				3924.96	
						say	3925.00	
15.5	2504		Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification					
			Unit = cum					
			Taking output = 1 cum					
			a) Material					
			Graded stone aggregate of required size	cum	1.20	408.83	490.60	M-012
			b) Labour					
			Mate	day	0.05	272.00	13.60	L-12
			Mazdoor (Skilled)	day	0.25	325.00	81.25	L-15
			Mazdoor *	day	1.00	257.00	257.00	L-13
			c) Overhead charges @ 0.21 on (a+b)				176.91	
			d) Contractor's profit @ 0.1 on (a+b+c)				101.94	
			Rate per cum = (a+b+c+d)				1121.30	
						say	1121.00	
			Includes Mazdoor required for trimming of slope to proper profile and preparation of bed.					
15.6	700 & 2504		Geotextile Filter					
			Laying of a geotextile filter between pitching and embankment slopes on which pitching is laid to prevent escape of the embankment material through the voids of the stone pitching/cement concrete blocks as well as to allow free movement of water without creating any uplift head on the pitching.					
			Unit = sqm					
			Taking output = 10 sqm.					
			a) Labour					
			Mate	day	0.02	272.00	5.44	L-12
			Mazdoor	day	0.30	257.00	77.10	L-13
			Mazdoor (Skilled)	day	0.10	325.00	32.50	L-15
			b) Material					
			Permeable synthetic geotextile including 5 per cent for overlap and wastage	sqm	11.00	input	#VALUE!	M-181
			c) Overhead charges @ 0.21 on (a+b)				#VALUE!	

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Analysis of Rates  
**RIVER TRAINING AND PROTECTION WORKS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				#VALUE!	
		Cost for 10 sqm = a+b+c+d				#VALUE!	
		<b>Rate per sqm = (a+b+c+d)/10</b>				#VALUE!	
					say	#VALUE!	
15.7	2504.4	<b>Toe protection</b>					
		A toe wall for toe protection can either be in dry rubble masonry in case of dry rubble pitching or pitching with stones in wire crates or it can be in PCC M15 nominal mix if cement concert block have been used for pitching . Rates for toe wall can be adopted from respective clauses depending upon approved design. The rate for excavation for foundation, dry rubble masonry and PCC M15 have been analysed and given in respective chapters.					
15.8	2505	<b>Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concert bedding.</b>					
	<b>A</b>	<b>Rubble stone laid in cement mortar 1:3</b>					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Cement mortar 1:3 (Rate as in Item 12.6 sub-analysis) excluding OH &amp; CP</b>	cum	0.33	3030.00	999.90	Item 12.6 (A)
		<b>b) Add for cement concrete bedding (M15 Nominal mix) vide Item 12.8 (A) excluding OH &amp; CP . Quantity shall be adopted as per design ( Assume Rubble stone Flooring thickness 300 mm and cement concrete bedding thickness 100 mm)</b>	cum	0.33	2780.00	917.40	Item 12.8 (A)
		Add 1 per cent of cost to account for excavation for preparation of bed.				19.17	
		<b>c) Material</b>					
		Stone	cum	1.00	303.85	303.85	M-003
		Stone Spalls	cum	0.20	303.85	60.77	M-008
		<b>d) Labour</b>					
		Mate	day	0.08	272.00	21.76	L-12
		Mason	day	0.50	345.00	172.50	L-11
		Mazdoor (for laying stones, filling of quarry spalls)	day	1.50	257.00	385.50	L-13
		<b>e) Overhead charges @ 0.21 on (a+c+d)</b>				408.30	
		<b>f) Contractor's profit @ 0.1 on (a+c+d+e)</b>				235.26	
		<b>Rate per cum = (a+b+c+d+e+f)</b>				3524.41	
					say	<b>3524.00</b>	
	*	Includes cement mortar for laying and filling of joints.					
15.8	<b>B</b>	<b>Cement Concrete blocks Grade M15</b>					
		Concrete Grade M15 block. (Rate as per item No. 12.8 (A) including OH & CP.	cum	1.00	3848.00	3848.00	Item 12.8 (A)
		Add for cement concrete bedding (M15 Nominal mix) vide Item 12.8 (A) including OH & CP. Quantity shall be adopted as per design ( Assume Cement Concrete blocks thickness 300mm and cement concrete bedding thickness 100mm)	cum	0.33	3848.00	1269.84	Item 12.8 (A)
		Add 1 per cent of cost to account for excavation for preparation of bed.				51.18	
		<b>Rate per cum</b>				5169.02	
					say	<b>5169.00</b>	
15.9	2506	<b>Dry Rubble Flooring</b>					
		Construction of dry rubble flooring at cross drainage works for relatively less important works.					
		<b>Unit = cum</b>					
		<b>Taking output = 1 cum</b>					
		<b>a) Material</b>					
		Stone	cum	1.00	303.85	303.85	M-003
		Stone Spalls	cum	0.20	303.85	60.77	M-008
		<b>b) Labour</b>					
		Mate	day	0.10	272.00	27.20	L-12

Analysis of Rates  
**RIVER TRAINING AND PROTECTION WORKS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mason	day	0.50	345.00	172.50	L-11
		mazdoor	day	1.50	257.00	385.50	L-13
		Add 1 per cent of (b) for trimming and preparation of base.				5.85	
		c) Overhead charges @ 0.21 on (a+b)				200.69	
		d) Contractor's profit @ 0.1 on (a+b+c)				115.64	
		Rate per cum = (a+b+c+d)				1272.00	
					say	<u>1272.00</u>	
15.10	2507.2	Curtain wall complete as per drawing and Technical specification					
	A	Stone masonry in cement mortar (1:3)					
		Coursed rubble masonry (1st sort)	cum	1.00	3083.00	3083.00	Item 12.7 (A)
		Rate same as per item No. 12.7 (A) including OH & CP					
		Rate per cum			say	<u>3083.00</u>	
		or					
15.10	B	Cement concrete Grade M15					
		Concrete Grade M15 Rate as per item No. 12.8 (A) including OH & CP	cum	1.00	3848.00	3848.00	Item 12.8 (A)
		Rate per cum			say	<u>3848.00</u>	
	Note	Other items like excavation for foundation, filling behind wall, filter media, weep holes etc. shall be added separately as per approved design.					
15.11	2507.2	Flexible Apron :Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall.					
		Unit = cum					
		Taking Output = 1 cum					
		a) Material					
		Stone	cum	1.00	303.85	303.85	M-003
		Stone Spalls	cum	0.20	303.85	60.77	M-008
		b) Labour					
		Mate	day	0.05	272.00	13.60	L-12
		Mason	day	0.25	345.00	86.25	L-11
		Mazdoor	day	1.00	257.00	257.00	L-13
		Add 1 per cent of cost of (a+b) for trimming and preparation of bed.				7.21	
		c) Overhead charges @ 0.21 on (a+b)				153.02	
		d) Contractor's profit @ 0.1 on (a+b+c)				88.17	
		Rate per cum = (a+b+c+d)				969.88	
					say	<u>970.00</u>	
15.12	2503.3	Gabian Structure for Retaining Earth					
		Providing and construction of a gabian structure for retaining earth with segments of wire crates of size 7 m x 3 m x 0.6 m each divided into 1.5 m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be tied with 4 mm galvanised steel wire.					
		Unit = cum					
		Taking output = 7 x 3 x 0.6 = 12.60 cum					
		a) Labour					
		Mate	day	0.28	272.00	76.16	L-12
		Mazdoor	day	5.00	257.00	1285.00	L-13
		Mazdoor (Skilled)	day	2.00	325.00	650.00	L-15
		b) Material					
		Galvanised steel wire crates of mesh size 100 mm x 100 mm woven with 4mm dia. GI wire in rolls of required size.	sqm	61.00	95.72	5838.92	M-102

Calc.  
12/8/19

Analysis of Rates  
**RIVER TRAINING AND PROTECTION WORKS**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Stone boulders with least dimension of 200 mm	cum	12.60	303.85	3828.51	M-003
		Stone spalls of minimum size 25 mm	cum	2.52	303.85	765.70	M-008
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				2613.30	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1505.76	
		Cost for 12.60 cum (a+b+c+d)				16563.35	
		<b>Rate per cum (a+b+c+d)/12.60</b>				1314.55	
					<b>say</b>	<b>1315.00</b>	
		<b>Note</b> Readymade woven wire crate rolls have been considered in the rate analysis. In case readymade rolls are not available, GI wire 4mm dia. @ 32 kg per 10 sqm may be provided. In that case 2 per cent of the cost of GI wire may be added for weaving the wire crates.					
15.13	2503.3	<b>Gabian Structure for Erosion Control, River Training Works and Protection works</b>					
		Providing and constructing gabian structures for erosion control, river training works and protection works with wire crates of size 2 m x 1 m x 0.3 m each divided into 1m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 mm x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be securely tied with 4 mm galvanised steel wire.					
		<b>Unit = cum</b>					
		<b>Taking output = 2 x 1 x 0.3 x 10 Nos. = 6.00 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.14	272.00	38.08	L-12
		Mazdoor	day	2.50	257.00	642.50	L-13
		Mazdoor (Skilled)	day	1.00	325.00	325.00	L-15
		<b>b) Material</b>					
		Galvanised steel wire crates of mesh size 100 mm x 100 mm woven with 4mm dia. GI wire in rolls of required size to cover 6.00 cum.	sqm	65.00	95.72	6221.80	M-102
		Stone boulders with least dimension of 200 mm	cum	6.00	303.85	1823.10	M-003
		Stone spalls of minimum size 25 mm	cum	1.20	303.85	364.62	M-008
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				1977.17	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1139.23	
		Cost for 6.00 cum (a+b+c+d)				12531.50	
		<b>Rate per cum (a+b+c+d)/6.00</b>				2088.58	
					<b>say</b>	<b>2089.00</b>	
		<b>Note</b> Readymade woven wire crate rolls have been considered in the rate analysis. In case readymade rolls are not available, GI wire 4mm dia. @ 32 kg per 10 sqm may be provided. In that case 2 per cent of the cost of GI wire may be added for weaving the wire crates.					

L.A.S.  
12/8/19





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**PART - D**  
**REPAIR &**  
**REHABILITATION**

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**CHAPTER-16**

**REPAIR &  
REHABILITATION**

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## Chapter – 16

### Repair and Rehabilitation

#### Preamble:

1. Removal of cement concrete wearing coat and asphaltic wearing coat has been proposed with pneumatic breakers.
2. The rate for external prestressing has been analysed for three different spans of 25, 50 and 100 m.
3. Sealing of cracks has been proposed with cement grout, cement mortar (1:1) grout and epoxy grout by injecting with grout pump through nipples.
4. Bonding of new concrete with old concrete is proposed with epoxy resin.
5. The repair and replacement of following structures has been included:
  - a) Bridge bearings
  - b) Expansion Joints
  - c) Concrete Railing
  - d) Mild steel railing
  - e) Crash barrier

*Chas.*  
12/8/19



Summary of Rate Analysis  
**CHAPTER - 16**  
**REPAIR AND REHABILITATION**

Item No.	Description	Unit	Rate (₹)
16.1	Removal of existing cement concrete wearing coat including its disposal complete as per Technical specification without causing any detrimental effect to any part of the bridge structure and removal of dismantled material with all lifts and lead upto 1000 m (Thickness 75 mm).	sqm	142.00
16.2	Removal of existing asphaltic wearing coat comprising of 50 mm thick asphaltic concrete laid over 12 mm thick mastic asphalt including disposal with all lift and lead upto 1000 m.	sqm	108.00
16.3	Guniting concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per Technical specification.	sqm	1023.00
16.4	Providing and inserting nipples with approved fixing compound after drilling holes for grouting as per Technical specifications including subsequent cutting/removal and sealing of the hole as necessary of nipples after completion of grouting with Cement/Epoxy.	each	#VALUE!
16.5	Sealing of cracks/porous concrete by injection process through nipples/Grouting complete as per Technical specification.		
A	Cement Grout	kg	140.00
B	Cement mortar (1:1) Grouting	kg	135.00
16.6	Patching of damaged concrete surface with polymer concrete and curing compounds, initiator and promoter, available in present formulations, to be applied as per instructions of manufacturer and as approved by the Engineer.	sqm	#VALUE!
16.7	Sealing of crack / porous concrete with Epoxy Grout by injection through nipples complete as per clause 2803.1.	kg	975.00
16.8	Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical specification.	sqm	698.00
16.9	Removal of defective concrete, cleaning the surface thoroughly, applying the shotcrete mixture mechanically with compressed air under pressure, comprising of cement, sand, coarse aggregates, water and quick setting compound in the proportion as per clause 2807.1, sand and coarse aggregates conforming to IS: 383 and table 1 of IS: 9012 respectively, water cement ratio ranging from 0.35 to 0.50, density of gunite not less than 2000 kg/cum, strength not less than 25 Mpa and workmanship conforming to clause 2807.6.	sqm	#VALUE!
16.10	Applying pre-packed cement based polymer mortar of strength 45 Mpa at 28 days for replacement of spalled concrete	sqm	#VALUE!
16.11	Epoxy bonding of new concrete to old concrete	sqm	806.00
16.12	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical specification	tonne	334879.00
16.13	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical specification	tonne	322178.00
16.14	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical specification	tonne	312516.00
16.15	Replacement of bearings complete as per Technical specification	each	#VALUE!
16.16	Rectification of bearings as per Technical specifications	each	#VALUE!
16.17	Replacement of Expansion Joints complete as per drawings	metre	2439.00
16.18	Replacement of damaged concrete railing.	metre	261.00
16.19	Replacement of crash barrier.	metre	447.00
16.20	Replacement of damaged mild steel railing	metre	224.00
16.21	Repair of crash barrier (Repair of concrete crash barrier with cement concrete of M-30 grade by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, applying cement concrete after erection of proper form work.)	metre	199.00
16.22	Repair of RCC Railing (Carrying out repair of RCC M30 railing to bring it to the original shape.)	metre	149.00
16.23	Repair of steel Railing (Repair of steel railing to bring it to the original shape.)	metre	281.00

*Calc.*  
12/8/19





Analysis of Rates

CHAPTER - 16

REPAIR AND REHABILITATION

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
16.1	2809	Removal of existing cement concrete wearing coat including its disposal complete as per Technical Specification without causing any detrimental effect to any part of the bridge structure and removal of dismantled material with all lifts and lead upto 1000 m					
		Unit = Sq m ( Thickness 75 mm)					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.06	272.00	16.32	L-12
		Mazdoor	day	1.00	257.00	257.00	L-13
		b) Machinery					
		Air Compressor 250 cfm with pneumatic breaker/jack hammer along with accessories.	hour	1.00	481.00	481.00	P&M-001
		Tractor-trolley.	hour	0.50	546.00	273.00	P&M-053
		c) Overhead charges @ 0.26 on (a+b)				267.10	
		d) Contractor's profit @ 0.1 on (a+b+c)				129.44	
		Cost for 10 sqm = (a+b+c+d)				1423.87	
		Rate per sqm = (a+b+c+d)/10				142.39	
					say	142.00	
16.2	2809	Removal of existing asphaltic wearing coat comprising of 50 mm thick asphaltic concrete laid over 12 mm thick mastic asphalt including disposal with all lift and lead upto 1000 m.					
		Unit = Sq m					
		Taking output = 10 sqm					
		a) Labour					
		Mate	day	0.03	272.00	8.16	L-12
		Mazdoor	day	0.75	257.00	192.75	L-13
		b) Machinery					
		Air Compressor 250 cfm with pneumatic breaker.	hour	0.75	481.00	360.75	P&M-001
		Tractor-trolley.	hour	0.40	546.00	218.40	P&M-053
		c) Overhead charges @ 0.26 on (a+b)				202.82	
		d) Contractor's profit @ 0.1 on (a+b+c)				98.29	
		Cost for 10 sqm = (a+b+c+d)				1081.16	
		Rate per sqm = (a+b+c+d)/10				108.12	
					say	108.00	
16.3	2807	Guniting concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per Technical Specification					
		Unit = Sq m					
		Taking output = 1 sqm					
		Assuming thickness 25 mm					
		a) Material					
		Cement	kg	16.00	5.156	82.50	M-081/1000
		Graded sand	cum	0.04	150.80	6.03	M-005
		Wire mesh 50mm x 50mm size of 3mm wire	kg	2.00	42.86	85.72	M-192
		Epoxy	kg	0.67	550.68	368.96	M-095
		Accelerator compound for guniting @ 4 per cent of weight of cement	kg	0.64	166.14	106.33	M-180
		Add 2 per cent of cost of material for miscellaneous consumables like nozzles, wire brush, cotton waste etc.				12.99	
		b) Labour					
		Mate	day	0.01	272.00	2.72	L-12
		Mason	day	0.04	345.00	13.80	L-11
		Mazdoor	day	0.14	257.00	35.98	L-13
		c) Machinery					
		Compressor with guniting equipment along with accessories	hour	0.10	234.00	23.40	P&M-076
		d) Overhead charges @ 0.26 on (a+b+c)				191.99	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				93.04	
		Rate per sqm = (a+b+c+d+e)				1023.46	
					say	1023.00	

Analysis of Rates  
**REPAIR AND REHABILITATION**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
16.4	2800	Providing and inserting nipples with approved fixing compound after drilling holes for grouting as per Technical Specifications including subsequent cutting/removal and sealing of the hole as necessary of nipples after completion of grouting with Cement/Epoxy					
		<b>Unit = Number</b>					
		<b>Taking output = 1 No.</b>					
		<b>a) Material</b>					
		Nipples	each	1.00	input	#VALUE!	M-129
		Cement, fixing compound and consumables @ 15 per cent of cost of nipple				#VALUE!	
		<b>b) Labour</b>					
		Mate	day	0.01	272.00	2.72	L-12
		Mazdoor (Skilled) labour for drilling	day	0.08	325.00	26.00	L-15
		Mazdoor (Skilled) labour for fixing nipple and sealing inlets	day	0.08	325.00	26.00	L-15
		Mazdoor for cutting and removing of nipples	day	0.04	257.00	10.28	L-13
		Add 10 per cent of labour cost for drilling holes etc				6.50	
		<b>c) Overhead charges @ 0.26 on (a+b)</b>				#VALUE!	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				#VALUE!	
		<b>Rate per No. = (a+b+c+d)</b>				#VALUE!	
					say	<b>#VALUE!</b>	
16.5	2806	Sealing of cracks/porous concrete by injection process through nipples/Grouting complete as per Technical Specification.					
	<b>A</b>	<b>Cement Grout</b>					
		<b>Unit = kg</b>					
		<b>Taking output = 1 kg</b>					
		<b>a) Material</b>					
		Cement including 10 per cent wastage	kg	1.10	5.16	5.67	M-081/1000
		Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement				1.13	
		<b>b) Labour</b>					
		Mate	day	0.08	272.00	21.76	L-12
		Mazdoor (Skilled)	day	0.10	325.00	32.50	L-15
		Mazdoor	day	0.10	257.00	25.70	L-13
		<b>c) Machinery</b>					
		Grout pump with agitator and accessories	hour	0.10	140.04	14.00	M-111
		<b>d) Overhead charges @ 0.26 on (a+b+c)</b>				26.20	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				12.70	
		<b>Rate per kg = (a+b+c+d+e)</b>				139.67	
					say	<b>140.00</b>	
	<b>B</b>	<b>Cement Mortar (1:1) Grouting</b>					
		<b>Unit = kg</b>					
		<b>Taking output = 1 kg</b>					
		<b>a) Material</b>					
		Cement including 10 per cent wastage	kg	0.55	5.16	2.84	M-081/1000
		Sand including 10 per cent wastage	kg	0.55	0.10	0.06	M-005/1500
		Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement				0.57	
		<b>b) Labour</b>					
		Mate	day	0.08	272.00	21.76	L-12
		Mazdoor (Skilled)	day	0.10	325.00	32.50	L-15
		Mazdoor	day	0.10	257.00	25.70	L-13
		<b>c) Machinery</b>					
		Grout pump with agitator and accessories	hour	0.10	140.04	14.00	M-111
		<b>d) Overhead charges @ 0.26 on (a+b+c)</b>				25.33	

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Analysis of Rates  
**REPAIR AND REHABILITATION**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		e) Contractor's profit @ 0.1 on (a+b+c+d)				12.28	
		Rate per kg = (a+b+c+d+e)				135.03	
					say	<u>135.00</u>	
16.6	2800	Patching of damaged concrete surface with polymer concrete and curing compounds, initiator and promoter, available in present formulations, to be applied as per instructions of manufacturer and as approved by the Engineer.					
		Unit = sqm					
		Taking output = 10 sqm for an average thickness of 25mm.					
		a) Labour					
		Mate	day	0.06	272.00	16.32	L-12
		Mazdoor (Skilled)	day	0.75	325.00	243.75	L-15
		Mazdoor	day	0.75	257.00	192.75	L-13
		b) Material					
		Pre-packed polymer concrete based on epoxy system complete with curing compound, initiator and promoter including 5 per cent wastage.	kg	315.00	input	#VALUE!	M-145
		c) Machinery					
		Grout pump with agitator and accessories	hour	2.00	140.04	280.08	M-111
		d) Overhead charges @ 0.26 on (a+b+c)				#VALUE!	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				#VALUE!	
		Cost for 10 sqm = a+b+c+d+e				#VALUE!	
		Rate per sqm = (a+b+c+d+e)/10				#VALUE!	
					say	<u>#VALUE!</u>	
		Note This item is a proprietary item available in market as pre-packed polymer concrete and is required to be applied as per instructions of the manufacturer.					
16.7	2803	Sealing of crack / porous concrete with Epoxy Grout by injection through nipples complete as per clause 2803.1.					
		Unit = kg					
		Taking output = 1 kg					
		a) Material					
		Epoxy including 10 per cent wastage	kg	1.10	550.68	605.75	M-095
		b) Labour					
		Mate	day	0.08	272.00	21.76	L-12
		Mazdoor (Skilled)	day	0.10	325.00	32.50	L-15
		Mazdoor	day	0.10	257.00	25.70	L-13
		c) Machinery					
		Epoxy Injection gun	hour	0.10	174.00	17.40	P&M-078
		d) Overhead charges @ 0.26 on (a+b+c)				182.81	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				88.59	
		Rate per kg = (a+b+c+d+e)				974.51	
					say	<u>975.00</u>	
16.8	2804	Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical Specification					
		Unit = sqm					
		Taking output = 10 sqm					
		Assume average 10mm thickness of epoxy mortar					
		a) Material					
		Epoxy resin-hardener mix for prime coat	kg	2.50	668.67	1671.68	M-098
		Epoxy mortar	kg	2.20	721.64	1587.61	M-096
		Epoxy resin -hardener mix for seal coat.	kg	2.00	668.67	1337.34	M-098

Analysis of Rates  
**REPAIR AND REHABILITATION**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Add 3 per cent cost of material for other consumables like acetone etc and to cover wastage.				137.90	
		<b>b) Labour</b>					
		Mate	day	0.04	272.00	10.88	L-12
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
		Mazdoor	day	0.50	257.00	128.50	L-13
		<b>c) Overhead charges @ 0.26 on (a+b)</b>				1309.46	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				634.59	
		Cost for 10 sqm = a+b+c+d				6980.45	
		<b>Rate per sqm = (a+b+c+d)/10</b>				698.05	
					say	<b>698.00</b>	
16.9	2807	Removal of defective concrete, cleaning the surface thoroughly, applying the shotcrete mixture mechanically with compressed air under pressure, comprising of cement, sand, coarse aggregates, water and quick setting compound in the proportion as per clause 2807.1., sand and coarse aggregates conforming to IS: 383 and table 1 of IS: 9012 respectively, water cement ratio ranging from 0.35 to 0.50, density of gunite not less than 2000 kg/cum, strength not less than 25 Mpa and workmanship conforming to clause 2807.6.					
		<i>unit: sqm</i>					
		<i>Taking output = 10 sqm, 40 mm average thickness.</i>					
		<b>a) Labour</b>					
		Mate	day	0.04	272.00	10.88	L-12
		Mazdoor	day	0.50	257.00	128.50	L-13
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
		<b>b) Machinery</b>					
		Air compressor 250 cfm	hour	1.00	481.00	481.00	P&M-001
		Shotcreteing equipment	hour	1.00	234.00	234.00	P&M-076
		water tanker 6 KL capacity	hour	0.02	183.00	3.66	P&M-060
		<b>c) Material</b>					
		Cement	kg	120.00	5.156	618.72	M-081/1000
		Sand	cum	0.15	150.80	22.62	M-005
		Coarse aggregate of size 4.75mm	cum	0.15	200.45	30.07	M-024
		Quick setting compound	kg	2.50	input	#VALUE!	M-147
		Water	KL	0.10	253.69	25.37	M-189
		<b>d) Overhead charges @ 0.26 on (a+b+c)</b>				#VALUE!	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				#VALUE!	
		Cost for 10 sqm = a+b+c+d+e				#VALUE!	
		<b>Rate per sqm = (a+b+c+d+e)/10</b>				#VALUE!	
					say	<b>#VALUE!</b>	
16.10	2800	Applying pre-packed cement based polymer mortar of strength 45 Mpa at 28 days for replacement of spalled concrete					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		Assumed thickness - 10 mm					
		<b>a) Material</b>					
		Acrylic polymer bonding coat	Litre	1.40	input	#VALUE!	M-057
		pre-packed cement based polymer mortar of strength 45 Mpa at 28 days	kg	12.00	input	#VALUE!	M-145
		Add 3 per cent of (a ) above for wastage.				#VALUE!	
		<b>b) Labour</b>					
		Mate	day	0.04	272.00	10.88	L-12
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15

Calc.  
12/8/19

Analysis of Rates  
**REPAIR AND REHABILITATION**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mazdoor	day	0.50	257.00	128.50	L-13
		c) Overhead charges @ 0.26 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Cost for 10 sqm = a+b+c+d				#VALUE!	
		Rate per sqm = (a+b+c+d)/10				#VALUE!	
					say	#VALUE!	
16.11	2805	Epoxy bonding of new concrete to old concrete					
		Unit = sqm					
		Taking output = 10 sqm					
		a) Material					
		Epoxy resin with pot life not less than 60-90 minutes and satisfying testing as per clause 2803.9	kg	8.00	668.67	5349.36	M-098
		Add 3 per cent of (a ) above for wastage.				160.48	
		b) Labour					
		Mate	day	0.04	272.00	10.88	L-12
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
		Mazdoor	day	0.50	257.00	128.50	L-13
		c) Overhead charges @ 0.26 on (a+b)				1511.05	
		d) Contractor's profit @ 0.1 on (a+b+c)				732.28	
		Cost for 10 sqm = a+b+c+d				8055.05	
		Rate per sqm = (a+b+c+d)/10				805.50	
					say	806.00	
16.12	2810	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification					
		Span assumed: 25 m					
		No. of cables: 4 no.					
		No. of anchorages : 8 no.					
		Unit = MT					
		Taking output = 1 MT					
		Assume 12.7mm dia. Strand in 12T13 system. Weight-9.42 kg/m of cable.					
		a) Material					
		HTS strand including 5 per cent wastage and extra length for jacking	tonne	1.05	69872.80	73366.44	M-119
		HDPE pipes 75mm dia including 5 per cent wastage	metre	112.00	191.60	21459.20	M-114
		Cement for grouting	kg	400.00	5.156	2062.40	M-081/1000
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	8.00	45.10	360.80	M-187
		Epoxy	kg	6.00	550.68	3304.08	M-095
		MS plates for deviator (where deviator blocks are not provided)	tonne	2.10	44927.00	94346.70	M-179
		Add 20 per cent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				38979.92	
		b) Labour					
		i) For making holes in the structure .					
		Mate	day	0.24	272.00	65.28	L-12
		Mazdoor (Semi-skilled)	day	3.00	268.00	804.00	L-14
		Mazdoor	day	3.00	257.00	771.00	L-13
		ii) For making and fixing anchorages for cables and placement of cables .					
		Mate	day	0.44	272.00	119.68	L-12
		Blacksmith	day	3.00	345.00	1035.00	L-02a
		Mazdoor	day	8.00	257.00	2056.00	L-13
		iii) For prestressing					

Analysis of Rates  
**REPAIR AND REHABILITATION**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate/Supervisor	day	0.13	272.00	35.36	L-12
		Fitter	day	0.70	351.00	245.70	L-08
		Mazdoor	day	2.65	257.00	681.05	L-13
		<b>iv) For grouting</b>					
		Mate/Supervisor	day	0.13	272.00	35.36	L-12
		Mason	day	0.70	345.00	241.50	L-11
		Mazdoor	day	2.65	257.00	681.05	L-13
		<b>c) Machinery</b>					
		Stressing jack with pump	hour	4.00	194.00	776.00	P&M-040
		Grouting pump with agitator	hour	1.35	140.04	189.05	M-111
		<b>d) Overhead charges @ 0.26 on (a+b+c)</b>				62820.05	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				30443.56	
		<b>Rate per MT = (a+b+c+d+e)</b>				334879.19	
					<b>say</b>	<b>334879.00</b>	
16.13	2810	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification					
		Span assumed: 50 m					
		No. of cables: 4 no.					
		No. of anchorages : 8 no.					
		Unit = MT					
		Taking output = 3.10 MT					
		Assume 12.7mm dia. Strand in 19T13 system. Weight-14.73 kg/m of cable.					
		<b>a) Material</b>					
		HTS strand including 5 per cent wastage and extra length for jacking	tonne	3.10	69872.80	216605.68	M-119
		HDPE pipes 90mm dia including 5 per cent wastage	metre	224.00	191.60	42918.40	M-115
		Cement for grouting	tonne	1.01	5156.00	5207.56	M-081
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	8.00	45.10	360.80	M-187
		Epoxy	kg	10.00	550.68	5506.80	M-095
		MS plates for deviator (where deviator blocks are not provided)	tonne	7.00	44927.00	314489.00	M-179
		Add 20 per cent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				117017.65	
		<b>b) Labour</b>					
		<b>i) For making holes in the structure .</b>					
		Mate	day	0.08	272.00	21.76	L-12
		Mazdoor Semi-skilled)	day	8.00	268.00	2144.00	L-14
		Mazdoor	day	8.00	257.00	2056.00	L-13
		<b>ii) For making and fixing anchorages for cables and placement of cables .</b>					
		Mate	day	1.28	272.00	348.16	L-12
		Blacksmith	day	7.00	345.00	2415.00	L-02a
		Mazdoor	day	25.00	257.00	6425.00	L-13
		<b>iii) For prestressing</b>					
		Mate/Supervisor	day	0.20	272.00	54.40	L-12
		Fitter	day	1.00	351.00	351.00	L-08
		Mazdoor	day	4.00	257.00	1028.00	L-13
		<b>iv) For grouting</b>					
		Mate/Supervisor	day	0.26	272.00	70.72	L-12
		Mason	day	1.50	345.00	517.50	L-11
		Mazdoor	day	5.00	257.00	1285.00	L-13

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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>c) Machinery</b>					
		Stressing jack with pump	hour	7.00	194.00	1358.00	P&M-040
		Grouting pump with agitator	hour	3.00	140.04	420.12	M-111
		<b>d) Overhead charges @ 0.26 on (a+b+c)</b>				187356.14	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				90795.67	
		<b>Cost for 3.10 MT = a+b+c+d+e</b>				998752.36	
		<b>Rate per MT = (a+b+c+d+e)/3.10</b>				322178.18	
					say	<b>322178.00</b>	
16.14	2810	Providing external prestressing with high tensile steel wires/strands including drilling for passage of prestressing steel, all accessories for stressing and stressing operation and grouting complete as per drawing and Technical Specification					
		Span assumed: 100 m					
		No. of cables: 6 no.					
		No. of anchorages : 12 no.					
		Unit = MT					
		Taking output = 9.28 MT					
		Assume 12.7mm dia. Strand in 19T13 system. Weight-14.73 kg/m of cable.					
		<b>a) Material</b>					
		HTS strand including 5 per cent wastage and extra length for jacking	tonne	9.28	69872.80	648419.58	M-119
		HDPE pipes 90 mm dia including 5 per cent wastage	metre	672.00	191.60	128755.20	M-115
		Cement for grouting	tonne	3.04	5156.00	15674.24	M-081
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	12.00	45.10	541.20	M-187
		Epoxy	kg	14.00	550.68	7709.52	M-095
		MS plates for deviator (where deviator blocks are not provided)	tonne	20.00	44927.00	898540.00	M-179
		Add 20 per cent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				339927.95	
		<b>b) Labour</b>					
		<b>i) For making holes in the structure .</b>					
		Mate	day	1.72	272.00	467.84	L-12
		Mazdoor Semi-skilled)	day	18.00	268.00	4824.00	L-14
		Mazdoor	day	25.00	257.00	6425.00	L-13
		<b>ii) For making and fixing anchorages for cables and placement of cables .</b>					
		Mate	day	4.00	272.00	1088.00	L-12
		Blacksmith	day	20.00	345.00	6900.00	L-02a
		Mazdoor	day	80.00	257.00	20560.00	L-13
		<b>iii) For prestressing</b>					
		Mate/Supervisor	day	0.30	272.00	81.60	L-12
		Fitter	day	1.50	351.00	526.50	L-08
		Mazdoor	day	6.00	257.00	1542.00	L-13
		<b>iv) For grouting</b>					
		Mate/Supervisor	day	1.00	272.00	272.00	L-12
		Mason	day	5.00	345.00	1725.00	L-11
		Mazdoor	day	20.00	257.00	5140.00	L-13
		<b>c) Machinery</b>					
		Stressing jack with pump	hour	10.00	194.00	1940.00	P&M-040
		Grouting pump with agitator	hour	10.00	140.04	1400.40	M-111
		<b>d) Overhead charges @ 0.26 on (a+b+c)</b>				544039.61	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				263649.96	
		<b>Cost for 9.28 MT = a+b+c+d+e</b>				2900149.61	



Analysis of Rates  
**REPAIR AND REHABILITATION**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Rate per MT = (a+b+c+d+e)/9.28				312516.12	
					say	<u>312516.00</u>	
16.15	2808	Replacement of Bearings complete as per Technical Specification					
		Unit = No					
		Taking output = 3 No.					
		Lifting of superstructure span by jacking up from below i.e. by placing the jacks on pier/abutment caps for span length of 30m.					
		a) Lifting of span					
		i) Hire charges for jack of 40 tonne lifting capacity.	each	3.00	1282.00	3846.00	P&M-084
		ii) Mate	day	0.64	272.00	174.08	L-12
		iii) Mazdoor (Skilled)	day	4.00	325.00	1300.00	L-15
		iv) Mazdoor	day	12.00	257.00	3084.00	L-13
		v) Wooden packing	cum	0.15	input	#VALUE!	M-195
		b) Replacement of bearing					
		Cost of bearing.	each	3.00	77610.30	232830.90	M-065
		c) Overhead charges @ 0.26 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Cost of repair of 3 bearings = a+b+c+d				#VALUE!	
		Rate of repair per bearing = (a+b+c+d)/3				#VALUE!	
					say	<u>#VALUE!</u>	
	Note	The work entails replacement of all the bearings on one side of the span.					
16.16	2808	Rectification of Bearings as per Technical Specifications					
		Unit = 1 No					
		Taking output = 3 No.					
		a) Lifting of superstructure span by jacking up from below i.e. by placing the jacks on pier/abutment caps for span length of 30m.					
		i) Hire charges for jack of 40 tonne lifting capacity.	each	3.00	1282.00	3846.00	P&M-084
		ii) Mate	day	0.64	272.00	174.08	L-12
		iii) Mazdoor (Skilled)	day	4.00	325.00	1300.00	L-15
		iv) Mazdoor	day	12.00	257.00	3084.00	L-13
		v) Wooden packing	cum	0.15	input	#VALUE!	M-195
		b) Cost of parts to be replaced for 3 bearings.	each	3.00	input	#VALUE!	M-064
		c) Overhead charges @ 0.26 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Cost of repair of 3 bearings = a+b+c+d				#VALUE!	
		Rate of repair per bearing = (a+b+c+d)/3				#VALUE!	
					say	<u>#VALUE!</u>	
	Note	The rectification of 3 bearings included in this analysis are on the same side of the span.					
16.17		Replacement of Expansion Joints complete as per drawings					
		Unit - 1 RM					
		Taking output = 12 RM					
		a) Material					
		Epoxy for bonding new concrete to old concrete @ 0.8 kg/sqm	kg	9.60	550.68	5286.53	M-095
		M-30 grade cement concrete excluding OH & CP (Rate as per items 14.1 C (i))	cum	3.60	3904.00	14054.40	Item 14.1(C) case II DIRECT
		b) Labour					
		Removal of old expansion joint including breaking of concrete, cutting of lugs and shifting of broken material etc.					

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Analysis of Rates  
**REPAIR AND REHABILITATION**

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Mate	day	0.26	272.00	70.72	L-12
		Mazdoor	day	6.00	257.00	1542.00	L-13
		Mazdoor (Skilled)	day	0.50	325.00	162.50	L-15
		c) Overhead charges @ 0.26 on (a+b)				5490.20	
		d) Contractor's profit @ 0.1 on (a+b+c)				2660.63	
		Cost for replacement of 12 RM = a+b+c+d				29266.98	
		Rate per RM = (a+b+c+d)/12				2438.92	
					say	<u>2439.00</u>	
	Note	The rate for the installation of new expansion joints may be taken from the chapter on superstructure. Broken concrete will have to be replaced which has been included in this analysis.					
16.18		Replacement of Damaged Concrete Railing.					
		Unit = RM					
		Taking output = 10 RM					
		a) Labour					
		Labour for dismantling old railing and disposal of dismantled material.					
		Mate	day	0.20	272.00	54.40	L-12
		Mazdoor	day	5.00	257.00	1285.00	L-13
		b) Machinery					
		Tractor-trolley for disposal of dismantled material	hour	1.00	546.00	546.00	P&M-053
		c) Overhead charges @ 0.26 on (a+b)				490.20	
		d) Contractor's profit @ 0.1 on (a+b+c)				237.56	
		Cost for 10 m = a+b+c+d				2613.16	
		Rate per metre = (a+b+c+d)/10				261.32	
					say	<u>261.00</u>	
	Note	The rate for the provision of new railing may be adopted from the chapter on superstructure.					
16.19		Replacement of Crash Barrier.					
		Unit = RM					
		Taking output = 10 M					
		a) Labour					
		Labour for dismantling old railing and disposal of dismantled material.					
		Mate	day	0.40	272.00	108.80	L-12
		Mazdoor	day	10.00	257.00	2570.00	L-13
		b) Machinery					
		Tractor-trolley for disposal of dismantled material	hour	1.00	546.00	546.00	P&M-053
		c) Overhead charges @ 0.26 on (a+b)				838.45	
		d) Contractor's profit @ 0.1 on (a+b+c)				406.32	
		Cost for 10 m = a+b+c+d				4469.57	
		Rate per metre = (a+b+c+d)/10				446.96	
					say	<u>447.00</u>	
	Note	The rate for the construction of new crash barrier may be adopted from chapter 8 on Traffic and Transportation.					
16.20		Replacement of Damaged Mild Steel Railing					
		Unit = RM					
		Taking output = 10 M					
		a) Labour					
		Labour for dismantling old railing and disposal of dismantled material.					
		Mate	day	0.16	272.00	43.52	L-12
		Mazdoor	day	4.00	257.00	1028.00	L-13
		b) Machinery					
		Tractor-trolley for disposal of dismantled material	hour	1.00	546.00	546.00	P&M-053

Analysis of Rates  
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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		c) Overhead charges @ 0.26 on (a+b)				420.56	
		d) Contractor's profit @ 0.1 on (a+b+c)				203.81	
		Cost for 10 m = a+b+c+d				2241.88	
		Rate per metre = (a+b+c+d)/10				224.19	
					say	<u>224.00</u>	
16.21		<b>Repair of Crash Barrier</b>					
		Repair of concrete crash barrier with cement concert of M-30 grade by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, applying cement concert after erection of proper form work.					
		Unit = Running meter.					
		Taking output = 10 M.					
		It is assumed that damage is to the extent of 10 per cent of the volume of concrete .This will require 0.30 cum of concrete.					
		a) Manpower*					
		Mate	day	0.04	272.00	10.88	L-12
		Mazdoor	day	1.00	257.00	257.00	L-13
		* For dismantling and trimming the surface to a regular shape and removal of damaged material.					
		b) Material					
		M-30 grade cement concrete excluding OH & CP (Rate as per items 14.1 C (i))	cum	0.30	3904.00	1171.20	Item 14.1(C) case II
		This may be priced based on the rate given the chapter of superstructure.					DIR used item
		c) Overhead charges @ 0.26 on (a+b)				374.16	
		d) Contractor's profit @ 0.1 on (a+b+c)				181.32	
		Cost for 10 m = a+b+c+d				1994.56	
		Rate per m = (a+b+c+d)/10				199.46	
					say	<u>199.00</u>	
16.22		<b>Repair of RCC Railing</b>					
		Carrying out repair of RCC M30 railing to bring it to the original shape.					
		Unit = Running meter.					
		Taking output = 10 M.					
		It is assumed that damage is to the extent of 10 per cent .					
		a) Material					
		M-30 grade cement concrete excluding OH & CP (Rate as per items 14.1 C (i))	cum	0.10	3904.00	390.40	Item 14.1(C) case II
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.013	48367.00	628.77	Item 14.2
		b) Labour*					DIR used item
		Mate	day	0.016	272.00	4.35	L-12
		mazdoor	day	0.20	257.00	51.40	L-13
		* For dismantling and trimming the surface to a regular shape and removal of damaged material.					
		c) Overhead charges @ 0.26 on (a+b)				279.48	
		d) Contractor's profit @ 0.1 on (a+b+c)				135.44	
		Cost for 10 m = a+b+c+d				1489.84	
		Rate per m = (a+b+c+d)/10				148.98	
					say	<u>149.00</u>	
16.23		<b>Repair of Steel Railing</b>					
		Repair of steel railing to bring it to the original shape					
		It is assumed that the damage to the steel railing is to the extent of 10 per cent .					

C. S. S. S.  
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Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<i>Unit = Running meter.</i>					
		<i>Taking output = 10 M.</i>					
		<b>a) Material</b>					
		Mild steel ISMC series	kg	29.00	44.927	1302.88	M-179/1000
		Flat iron	kg	10.00	44.927	449.27	M-179/1000
		MS Bolt and nuts	kg	1.00	61.19	61.19	M-130
		Add 5 per cent of cost of material for painting.				90.67	
		<b>b) Labour</b>					
		Mate	day	0.016	272.00	4.35	L-12
		Mazdoor (Skilled)	day	0.20	325.00	65.00	L-15
		Mazdoor	day	0.20	257.00	51.40	L-13
		<b>c) Overhead charges @ 0.26 on (a+b)</b>				526.44	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				255.12	
		Cost of repair for 10m = a+b+c+d				2806.32	
		<b>Cost of meter = (a+b+c+d)/10</b>				280.63	
					<b>say</b>	<b>281.00</b>	

Calc.  
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# **ANNEXURE**

## **SUB-ANALYSIS B**

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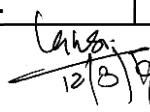
Summary of Rate Analysis  
**SUB-ANALYSIS\_B**

Item No.	Description	Unit	Rate (₹)
<b>3.1</b>	<b>Excavation in Soil by Manual Means.</b>		
SUB ANA - B (1)	Excavation for roadway in soil using manual means including loading in truck for carrying of cut earth to embankment site with all lifts and lead upto 1000 metres. <b>(Inclusive of royalty @ ₹22.00 per cum but exclusive of the cost of watering, rolling &amp; compaction.)</b>	cum	229.00
SUB ANA - B (2)	Excavation for roadway in soil using manual means including loading in truck for carrying of cut earth to embankment site with all lifts and lead upto 1000 metres. <b>(Inclusive of royalty @ ₹22.0 per cum and the cost of watering, rolling, and compaction.)</b>	cum	254.00
<b>3.2</b>	<b>Excavation in Ordinary Rock by Manual Means</b>		
SUB ANA - B	Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with in all lifts and leads upto 1000 metres. <b>(Inclusive of royalty @ ₹22.00 per cum but exclusive of the cost of watering , rolling &amp; compaction.)</b>	cum	294.00
SUB ANA - B	Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with in all lifts and leads upto 1000 metres. <b>(Inclusive of royalty @ ₹22.00 per cum and the cost of watering , rolling &amp; compaction- from immediate vicinity)</b>	cum	319.00
<b>3.6</b>	<b>Excavation in Soil using Hydraulic Excavator CK 90 and Tippers with Disposal upto 1000 metres</b>		
SUB ANA - B	Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m <b>(Including royalty @ ₹22.00 per cum and the cost of watering, rolling &amp; compaction.)</b>	cum	139.00
<b>3.7</b>	<b>Excavation in Ordinary Rock using Hydraulic Excavator CK-90 and Tippers with Disposal upto 1000 metres</b>		
SUB ANA - B	Excavation for roadway in ordinary rock with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, transporting to embankment site within all lifts and lead upto 1000 m, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections. <b>(Inclusive of royalty @ ₹22.00 per cum and the cost of watering, rolling &amp; compaction.)</b>	cum	161.00
<b>3.10</b>	<b>Excavation in Marshy Soil</b>		
SUB ANA - B	Excavation for roadway in marshy soil with hydraulic excavator 0.9 cum bucket capacity including cutting and loading in tippers and disposal with in all lifts and lead upto 1000 metres, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections. <b>(Inclusive of royalty @ ₹22.00 per cum and the cost of watering, rolling &amp; compaction.)</b>	cum	148.00
<b>3.16</b>	<b>Construction of Embankment with Material obtained from Borrowpits</b>		
SUB ANA - B	Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300-2.	cum	244.00
<b>3.17</b>	<b>Construction of Embankment with Material Deposited from Roadway Cutting</b>		
SUB ANA - B	Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2.	cum	180.00
<b>3.18</b>	<b>Construction of Subgrade and Earthen Shoulders</b>		
SUB ANA - B	Construction of sub-grade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2	cum	280.00
<b>3.19</b>	<b>Compacting Original Ground (Rolling with Smooth Wheeled Roller)</b>		



### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
SUB ANA - B	Case-I : Compacting original ground supporting sub-grade	cum	72.30
SUB ANA - B	Case- II: Compacting original ground supporting embankment	cum	37.10
<b>5.11</b>	<b>Close Graded Premix Surfacing/Mixed Seal Surfacing</b>		
Sub - Analysis for Type 'B'	Mechanical means using HMP of appropriate capacity not less than 75 tonnes/hour. Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-A) or 13.2 mm to 0.09 mm (Type-B) aggregates.....	cum	122.00
<b>4.9</b>	<b>Water Bound Macadam</b>		
SUB ANA - B	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with 3 wheeled steel/ vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density. <b>By Manual Means: With Smooth 3 wheeled Steel Roller</b>		
<b>4.9A (i)</b>	<b>Grading-I : Using Screening Crushable type such as Moorum or Gravel</b>	cum	987.00
<b>4.9A (i)</b>	<b>Grading-I : Using Screening Type-A (13.2mm agg.)</b>	cum	1101.00
<b>4.9A (ii)</b>	<b>Grading-II : Using Screening Crushable type such as Moorum or Gravel</b>	cum	1030.00
<b>4.9A (ii)</b>	<b>Grading-II : Using Screening Type-A (13.2mm agg.)</b>	cum	1085.00
<b>4.9A (ii)</b>	<b>Grading-II : Using Screening Type-B (11.2mm agg.)</b>	cum	1094.00
<b>4.9A (iii)</b>	<b>Grading-III : Using Screening Crushable type such as Moorum or Gravel</b>	cum	1073.00
<b>4.9A (iii)</b>	<b>Grading-III : Using Screening Type-B (11.2mm agg.)</b>	cum	1137.00
SUB ANA - B	Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with 3 wheeled steel/ vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density. <b>By Mechanical Means: With Smooth 3 wheeled Steel Roller</b>		
<b>4.9B (i)</b>	<b>Grading-I : Using Screening Crushable type such as Moorum or Gravel</b>	cum	846.00
<b>4.9B (i)</b>	<b>Grading-I : Using Screening Type-A (13.2mm agg.)</b>	cum	960.00
<b>4.9B (ii)</b>	<b>Grading-II : Using Screening Crushable type such as Moorum or Gravel</b>	cum	889.00
<b>4.9B (ii)</b>	<b>Grading-II : Using Screening Type-A (13.2mm agg.)</b>	cum	944.00
<b>4.9B (ii)</b>	<b>Grading-II : Using Screening Type-B (11.2mm agg.)</b>	cum	953.30
<b>4.9B (iii)</b>	<b>Grading-III : Using Screening Crushable type such as Moorum or Gravel</b>	cum	932.00
<b>4.9B (iii)</b>	<b>Grading-III : Using Screening Type-B (11.2mm agg.)</b>	cum	996.00
<b>4.10</b>	<b>Crushed Cement Concrete Sub-base / Base</b>		
SUB ANA - B	Breaking and crushing of material obtained by breaking damaged cement concrete slabs to size range not exceeding 75 mm as specified in table 400.7 transporting the aggregates obtained from breaking of cement concrete slabs at a lead of L km., laying and compacting the same as sub base/ base course, constructed as WBM to clause 404 except the use of screening or binding Material: <b>With Smooth 3 wheeled Steel Roller</b>	cum	289.00
<b>4.12</b>	<b>Wet Mix Macadam</b>		
SUB ANA - B	Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density: <b>With Smooth 3 wheeled Steel Roller</b>	cum	1013.00
<b>12.5</b>	<b>Brick Masonry Work in Cement Mortar 1:2 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.</b>	cum	6314.00
<b>12.5</b>	<b>Brick Masonry Work in Cement Mortar 1:4 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.</b>	cum	5875.00
<b>12.5</b>	<b>Brick Masonry Work in Cement Mortar 1:6 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.</b>	cum	5701.00



### Summary of Rate Analysis

Item No.	Description	Unit	Rate (₹)
3.19	Rolling, Watering and Compaction with Smooth Wheeled Roler.	cum	31.10
13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical Specification: Sandy material - Coarse Sand	cum	647.00
8.44	Permanent Type Barricade in Construction Zone : C : With FLY ASH Bricks	each	13138.00
11.14	Half Brick Circular Tree Guard, in 2nd Class Brick, internal diametre 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground: With FLY ASH Bricks	each	1591.00
11.15	Edging with 2nd Class Bricks, Laid Dry Lengthwise: With FLY ASH Bricks	metre	32.80
12.5	Brick masonry work in cement mortar in foundation complete excluding pointing and plastering, as per drawing and technical specifications: With FLY ASH Bricks		
(i)	Rate for Brick Work in C. M. 1:2 in foundation	cum	5511.00
(ii)	Rate for Brick Work in C. M. 1:3 in foundation	cum	5250.00
(iii)	Rate for Brick Work in C. M. 1:4 in foundation	cum	5072.00
(iv)	Rate for Brick Work in C. M. 1:6 in foundation	cum	4898.00
13.1	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and Technical Specifications : With FLY ASH Bricks	cum	5212.00
5.11A	Close Graded Premix Surfacing/Mixed Seal Surfacing	sqm	120.00
12.7 (Add)	Stone masonry work in cement mortar 1:6 in foundation complete as drawing and technical Specification	cum	2528.00

  
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## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
3.1	301		<b>Excavation in Soil by Manual Means</b>					
SUB ANA -B (1)			Excavation for roadway in soil using manual means including loading in truck for carrying of cut earth to embankment site with all lifts and lead upto 1000 metres. (Inclusive of royalty @ ₹22.00 per cum but <u>exclusive</u> of the cost of watering , rolling & compaction.)					
		Note	In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, <u>the item of carriage in the truck shall be omitted.</u>					
			<b>Unit = cum</b>					
			<b>Taking output = 120 cum</b>					
			<b>a) Labour</b>					
			Mate	day	1.800	272.00	489.60	L-12
			Mazdoor	day	45.000	257.00	11565.00	L-13
			<b>b) Machinery</b>					
			Truck 5.5 cum capacity	hour	10.000	929.00	9290.00	P&M-057
			<b>c) Overhead charges @ 0.06 on (a+b)</b>				1280.68	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2262.53	
			Cost of 120 cum = a+b+c+d				24887.80	
			<b>Rate per cum = (a+b+c+d)/120</b>				207.40	
			<b>Royalty @Rs22.0 per Cum</b>				22.00	
			<b>Rate per cum</b>			say	229.00	
3.1	301		<b>Excavation in Soil by Manual Means</b>					
SUB ANA -B (2)			Excavation for roadway in soil using manual means including loading in truck for carrying of cut earth to embankment site with all lifts and lead upto 1000 metres. (Inclusive of royalty @ ₹22.0 per cum and the cost of watering, rolling, and compaction.)					
			<b>Unit = cum</b>					
			<b>Taking output = 120 cum</b>					
			<b>a) Labour</b>					
			Mate	day	1.800	272.00	489.60	L-12
			Mazdoor	day	45.000	257.00	11565.00	L-13
			<b>b) Machinery</b>					
			Truck 5.5 cum capacity	hour	10.000	929.00	9290.00	P&M-057
			Smooth wheel roller @ 70 cum per hour	hour	1.500	781.00	1171.50	P&M-044
			Water Tanker @ 6.0 KL capacity	hour	0.800	183.00	146.40	P&M-060
			<b>c) Materials</b>					
			Cost of water	KL	4.800	253.69	1217.71	M-189
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				1432.81	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				2531.30	
			Cost of 120 cum = a+b+c+d+e				27844.33	
			<b>Rate per cum = (a+b+c+d+e)/120</b>				232.04	
			<b>Royalty @Rs22.0 per Cum</b>				22.00	
			<b>Rate per cum</b>			say	254.00	
3.2	301		<b>Excavation in Ordinary Rock by Manual Means</b>					
SUB ANA -B			Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with in all lifts and leads upto 1000 metres. (Inclusive of royalty @ ₹22.00 per cum but exclusive of the cost of watering , rolling & compaction.)					
			<b>Unit = cum</b>					
			<b>Taking output = 120 cum</b>					
			<b>a) Labour</b>					
			Mate	day	2.800	272.00	761.60	L-12
			Mazdoor	day	70.000	257.00	17990.00	L-13
			<b>b) Machinery</b>					
			Truck 5.5 cum capacity	hour	10.000	929.00	9290.00	P&M-057

## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		c) Overhead charges @ 0.06 on (a+b)				1682.50	
		d) Contractor's profit @ 0.1 on (a+b+c)				2972.41	
		Cost for 120 cum = a+b+c+d				32696.51	
		Rate per cum = (a+b+c+d)/120				272.47	
		Royalty @ ₹22.00 per Cum				22.00	
		Rate per cum				294.47	
					say	294.00	
		<b>Note</b> In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, the item of carriage in the truck shall be omitted.					
3.2	301	<b>Excavation in Ordinary Rock by Manual Means</b>					
SUB ANA -B		Excavation in ordinary rock using manual means including loading in a truck and carrying of excavated material to embankment site with in all lifts and leads upto 1000 metres. (Inclusive of royalty @ ₹22.00 per cum and the cost of watering, rolling & compaction - from immediate vicinity)					
		Unit = cum					
		Taking output = 120 cum					
		a) Labour					
		Mate	day	2.800	272.00	761.60	L-12
		Mazdoor	day	70.000	257.00	17990.00	L-13
		b) Machinery					
		Truck 5.5 cum capacity	hour	10.000	929.00	9290.00	P&M-057
		Smooth wheel roller @ 70 cum per hour	hour	1.500	781.00	1171.50	P&M-044
		Water Tanker @ 6.0 KL capacity	hour	0.800	183.00	146.40	P&M-060
		c) Materials					
		Cost of water	KL	4.800	253.69	1217.71	M-189
		d) Overhead charges @ 0.06 on (a+b+c)				1834.63	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				3241.18	
		Cost for 120 cum = a+b+c+d				35653.03	
		Rate per cum = (a+b+c+d)/120				297.11	
		Royalty @ ₹22.00 per Cum				22.00	
		Rate per cum				319.11	
					say	319.00	
3.6	301	<b>Excavation in Soil using Hydraulic Excavator CK 90 and Tippers with Disposal upto 1000 metres</b>					
SUB ANA -B		Excavation for roadwork in soil with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location within all lifts and lead upto 1000m (Including royalty @ ₹22.00 per cum and the cost of watering, rolling & compaction.)					
		Unit = cum					
		Taking output = 360 cum					
		a) Labour					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		b) Machinery					
		Hydraulic excavator 0.9 cum bucket capacity @ 60 cum per hour	hour	6.000	1958.00	11748.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.000	1018.00	16288.00	P&M-048
		Smooth wheel roller @ 70 cum per hour	hour	4.500	781.00	3514.50	P&M-044
		Water Tanker @ 6.0 KL capacity	hour	2.400	183.00	439.20	P&M-060
		c) Materials					
		Cost of water	KL	14.400	253.69	3653.14	M-189
		d) Overhead charges @ 0.06 on (a+b+c)				2170.72	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				3834.93	
		Cost for 360 cum = a+b+c+d				42184.24	
		Rate per cum = (a+b+c+d)/360				117.18	
		Royalty @ ₹22.00 per Cum				22.00	
		Rate per cum				139.18	
					say	139.00	

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## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
3.7	301	Excavation in Ordinary Rock using Hydraulic Excavator CK-90 and Tippers with Disposal upto 1000 metres					
SUB ANA -B		Excavation for roadway in ordinary rock with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, transporting to embankment site within all lifts and lead upto 1000 m, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections. (Inclusive of royalty @ ₹22.00 per cum and the cost of watering, rolling & compaction.)					
		Unit = cum					
		Taking output = 240 cum					
		a) Labour					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		b) Machinery					
		Hydraulic Excavator 0.90 cum bucket capacity @ 36 cum per hour	hour	6.000	1958.00	11748.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	11.000	1018.00	11198.00	P&M-048
		Smooth wheel roller @ 70 cum per hour	hour	3.000	781.00	2343.00	P&M-044
		Water Tanker @ 6.0 KL capacity	hour	1.600	183.00	292.80	P&M-060
		c) Materials					
		Cost of water	KL	9.600	253.69	2435.42	M-189
		d) Overhead charges @ 0.06 on (a+b+c)				1713.18	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				3026.62	
		Cost for 240 cum = a+b+c+d+e				33292.78	
		Rate per cum = (a+b+c+d+e)/240				138.72	
		Royalty @ ₹22.00 per Cum				22.00	
		Rate per cum				160.72	
					say	161.00	
3.10	301	Excavation in Marshy Soil					
SUB ANA -B		Excavation for roadway in marshy soil with hydraulic excavator 0.9 cum bucket capacity including cutting and loading in tippers and disposal with in all lifts and lead upto 1000 metres, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections. (Inclusive of royalty @ ₹22.00 per cum and the cost of watering, rolling & compaction.)					
		Unit = cum					
		Taking output = 300 cum					
		a) Labour					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		b) Machinery					
		Hydraulic excavator 0.90 cum bucket capacity @ 50 cum per hour	hour	6.000	1958.00	11748.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	13.640	1018.00	13885.52	P&M-048
		Smooth wheel roller @ 70 cum per hour	hour	3.750	781.00	2928.75	P&M-044
		Water Tanker @ 6.0 KL capacity	hour	2.000	183.00	366.00	P&M-060
		c) Materials					
		Cost of water	KL	12.000	253.69	3044.28	M-189
		d) Overhead charges @ 0.06 on (a+b+c)				1950.50	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				3445.88	
		Cost for 300 cum = a+b+c+d+e				37904.69	
		Rate per cum = (a+b+c+d+e)/300				126.35	
		Royalty @ ₹22.00 per Cum				22.00	
		Rate per cum				148.35	
					say	148.00	
3.16	305	Construction of Embankment with Material obtained from Borrowpits					
SUB ANA -B		Construction of embankment with approved material obtained from borrow pits with all lifts and leads, transporting to site, spreading, grading to required slope and compacting to meet requirement of table 300.2.					

## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Unit = cum</b>					
		<b>Taking output = 100 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.040	272.00	10.88	L-12
		Mazdoor	day	1.000	257.00	257.00	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1958.00	3269.86	P&M-026
		Tipper 10 tonne capacity	tonne.km	<b>160 x L</b>	8.86	<b>1417.60</b>	P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>141.76</b>	
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	5598.00	2799.00	P&M-014
		Motor grader for grading @ 100 cum per hour	hour	1.000	2697.00	2697.00	P&M-032
		Water tanker 6 KL capacity	hour	4.000	183.00	732.00	P&M-060
		Smooth wheel roller 8-10 tonnes @ 70 cum per hour	hour	1.430	781.00	1116.83	P&M-044
		<b>c) Material</b>					
		Cost of water	KL	24.000	253.69	6088.56	M-189
		Compensation & Royalty for earth taken from private land	cum	100.000	23.78	2378.00	M-092
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				1254.51	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				2216.30	
		Cost for 100 cum = a+b+c+d+e				24379.30	
		<b>Rate per cum = (a+b+c+d+e)/100</b>				243.79	
					<b>say</b>	<b>244.00</b>	
		<b>Note</b>					Compensation for earth will vary from place to place and will have to be assessed realistically as per particular ground situation. In case earth is available from Govt. land, compensation for earth will not be required. The position is required to be clearly stated in the cost estimate.
3.17	305	<b>Construction of Embankment with Material Deposited from Roadway Cutting</b>					
SUB ANA -B		Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2.					
		<b>Unit = cum</b>					
		<b>Taking output = 100 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.020	272.00	5.44	L-12
		Mazdoor	day	0.500	257.00	128.50	L-13
		<b>b) Machinery</b>					
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	5598.00	2799.00	P&M-014
		Motor grader for grading @ 100 cum per hour	hour	1.000	2697.00	2697.00	P&M-032
		Water tanker 6 KL capacity	hour	4.000	183.00	732.00	P&M-060
		Smooth wheel roller 8-10 tonnes @ 56 cum per hour	hour	1.430	781.00	1116.83	P&M-044
		<b>c) Material</b>					
		Cost of water	KL	24.000	253.69	6088.56	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				814.04	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1438.14	
		Rate for 100 cum = a+b+c+d+e				15819.51	
		<b>Rate per cum = (a+b+c+d+e)/100</b>				158.20	
		<b>Royalty @ ₹22.00 per Cum</b>				<b>22.00</b>	
					<b>say</b>	<b>180.00</b>	
		<b>Note</b>					In case the earth cutting is done by dozer and pushed for filling in the embankment, the input of dozer in the cost of embankment shall be deleted as the same is already provided in the cost of excavation. However, if the earth is dumped by tippers from roadway cutting, the input of dozer for spreading is required to be provided.

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## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
3.18	305		<b>Construction of Subgrade and Earthen Shoulders</b>					
SUB ANA -B			Construction of sub-grade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2					
			<b>Unit = cum</b>					
			<b>Taking output = 100 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.040	272.00	10.88	L-12
			Mazdoor	day	1.000	257.00	257.00	L-13
			<b>b) Machinery</b>					
			Hydraulic excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1958.00	3269.86	P&M-026
			Tipper 10 tonne capacity	tonne.km	175xL	8.86	1550.50	P&M-047
			<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				155.05	
			Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	5598.00	2799.00	P&M-014
			Motor grader for grading @ 50 cum per hour	hour	2.000	2697.00	5394.00	P&M-032
			Water tanker with 6 km lead	hour	4.000	183.00	732.00	P&M-060
			Smooth wheel roller 8-10 tonnes @ 56 cum per hour	hour	1.790	781.00	1397.99	P&M-044
			<b>c) Material</b>					
			Cost of water	KL	24.000	253.69	6088.56	M-189
			<b>Compensation &amp; Royalty for earth taken from private land</b>	cum	100.000	23.78	2378.00	M-092
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				1441.97	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				2547.48	
			Cost for 100 cum = a+b+c+d+e				28022.29	
			<b>Rate per cum = (a+b+c+d+e)/100</b>				280.22	
						say	280.00	
3.19	305.3.4		<b>Compacting Original Ground</b>					
		Case-I	<b>Compacting original ground supporting sub-grade</b>					
SUB ANA -B			Loosening of the ground upto a level of 500 mm below the sub-grade level, watered, graded and compacted in layers to meet requirement of table 300-2 for sub-grade construction.					
			<b>Unit = cum</b>					
			<b>Taking output = 600 cum</b>					
			<b>a) Labour</b>					
			Mate	day	0.120	272.00	32.64	L-12
			Mazdoor	day	3.000	257.00	771.00	L-13
			<b>b) Machinery</b>					
			Tractor with ripper attachment	hour	9.000	558.00	5022.00	P&M-055
			Motor grader for grading	hour	6.000	2697.00	16182.00	P&M-032
			Water tanker 6 KL capacity	hour	4.000	183.00	732.00	P&M-060
			<b>Smooth wheel roller 8-10 tonnes @ 56 cum per hour</b>	hour	10.710	781.00	8364.51	P&M-044
			<b>c) Material</b>					
			Cost of water	KL	24.000	253.69	6088.56	M-189
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				2231.56	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				3942.43	
			Cost for 600 cum = a+b+c+d+e				43366.70	
			<b>Rate per cum = (a+b+c+d+e)/600</b>				72.28	
						say	72.30	
3.19		Case-II	<b>Compacting original ground supporting embankment</b>					
SUB ANA -B			Loosening, leveling and Compacting original ground supporting embankment to facilitate placement of first layer of embankment, scarified to a depth of 150 mm, mixed with water at OMC and then compacted by rolling so as to achieve minimum dry density as given in Table 300-2 for embankment construction.					
			<b>Unit = cum</b>					



## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Taking output = 600 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.080	272.00	21.76	L-12
		Mazdoor	day	2.000	257.00	514.00	L-13
		<b>b) Machinery</b>					
		Tractor with ripper attachment	hour	6.000	558.00	3348.00	P&M-055
		Smooth wheel roller 8-10 tonnes @ 56 cum per hour	hour	10.710	781.00	8364.51	P&M-044
		Water tanker 6 KL capacity	hour	4.000	183.00	732.00	P&M-060
		<b>c) Material</b>					
		Cost of water	KL	24.000	253.69	6088.56	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				1144.13	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				2021.30	
		Cost for 600 cum = (a+b+c+d+e)				22234.26	
		<b>Rate per sqm = (a+b+c+d+e)/600</b>				37.06	
					<b>say</b>	<b>37.10</b>	
5.11	512	<b>Close Graded Premix Surfacing/Mixed Seal Surfacing</b>					
		Mechanical means using HMP of appropriate capacity not less than 75 tonnes/hour.					
	Sub - Analysis for Type 'B'	Case I Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-A) or 13.2 mm to 0.09 mm (Type-B) aggregates using penetration grade bitumen to the required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade.					
		<b>Unit = sqm</b>					
		<b>Taking output = 10250 sqm (205 cum)</b>					
		<b>a) Labour</b>					
		Mate	day	0.840	272.00	228.48	L-12
		Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	257.00	4112.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
		<b>b) Machinery</b>					
		i) HMP of appropriate capacity - 75 t per hour	hour	6.000	39088.00	234528.00	P&M-022
		ii) Electric Generator Set 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
		iii) Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		iv) Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead = 1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				398.70	
		v) Paver finisher hydrostatic with sensor attachment	hour	6.000	3505.00	21030.00	P&M-034
		iv) Smooth wheeled 8-10 tonnes weight	hour	6.000	781.00	4686.00	P&M-044
		<b>c) Material</b>					
		<b>Type - B</b>					
		Bitumen @ 19 kg per 10 sqm	tonne	19.480	32830.00	639528.40	M-074
		Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	276.750	470.04	130083.57	M-042
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				64235.47	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				113482.66	
		Cost for 10250 sqm = a+b+c+d+e				1248309.28	
		<b>Rate per sqm = (a+b+c+d+e)/10250</b>				121.79	
		<b>For Type 'B'</b>			<b>say</b>	<b>122.00</b>	

Calc. 12/8/19

## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
4.9	404	<b>Water Bound Macadam</b>					
SUB ANA -B		Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with 3 wheeled steel/ vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density.					
		<b>By Manual Means</b>					
	A	<b>Unit = cum</b>					
		<b>Taking output = 360 cum</b>					
		<b>a) Labour</b>					
		Mate	day	10.080	272.00	2741.76	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	250.000	257.00	64250.00	L-13
		<b>b) Machinery</b>					
		Smooth 3 wheeled steel roller @ 30cum/hour	hour	12.000	781.00	9372.00	P&M-044
		Water tanker 6 KL capacity	hour	24.000	183.00	4392.00	P&M-060
		<b>c) Material ( Refer table 400 - 7, 8 &amp; 9 )</b>					
4.9A		<b>Grading-I</b>					
	(i)	<b>Aggregate</b>					
		Grading-I 90 mm to 45 mm@ 1.21cum per 10 sqm for compacted thickness of 100 mm	cum	435.600	396.24	172602.14	M-039
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	470.04	45687.89	M-042
		<b>OR</b>				0.00	
		Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	131.28	14178.24	M-007
						0.00	
		<b>Binding material</b>					
		Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9A (i)		<b>Using Screening Crushable type such as Moorum or Gravel(Without binding material)</b>					
	(a)	<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				18283.05	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				32300.06	
		Cost for 360 cum = a+b+c+d+e				355300.61	
		<b>Rate per cum = (a+b+c+d+e)/360</b>				986.95	
					<b>say</b>	<b>987.00</b>	
		<b>OR</b>					
4.9A (i)		<b>Using Screening Type-A (13.2mm agg.(With binding material)</b>					
	(b)	<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				20400.48	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				36040.85	
		Cost for 360 cum = a+b+c+d+e				396449.35	
		<b>Rate per cum = (a+b+c+d+e)/360</b>				1101.25	
					<b>say</b>	<b>1101.00</b>	
4.9A		<b>Grading-II</b>					
	(ii)	<b>Aggregate</b>					
		Grading-II 63 mm to 45 mm /Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	427.69	186301.76	M-038
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-II @ 0.12 cum per 10 sqm	cum	57.600	470.04	27074.30	M-042
		<b>OR</b>					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	131.28	13861.86	M-007
		<b>OR</b>					

## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Type B 11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	345.52	29852.93	M-041
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9A (ii)		<b>Using Screening Crushable type such as Moorum or Gravel(Without binding material)</b>					
	(a)	d) Overhead charges @ 0.06 on (a+b+c)				19086.04	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				33718.68	
		Cost for 360 cum = a+b+c+d+e				370905.46	
		Rate per cum = (a+b+c+d+e)/360				1030.29	
					say	<u>1030.00</u>	
		OR					
4.9A (ii)		<b>Using Screening Type-A (13.2mm agg.)(With binding material)</b>					
	(b)	d) Overhead charges @ 0.06 on (a+b+c)				20105.64	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				35519.97	
		Cost for 360 cum = a+b+c+d+e				390719.66	
		Rate per cum = (a+b+c+d+e)/360				1085.33	
					say	<u>1085.00</u>	
4.9A (ii)		<b>Using Screening Type-B (11.2mm agg.)(With binding material)</b>					
	(c)	d) Overhead charges @ 0.06 on (a+b+c)				20272.36	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				35814.50	
		Cost for 360 cum = a+b+c+d+e				393959.54	
		Rate per cum = (a+b+c+d+e)/360				1094.33	
					say	<u>1094.00</u>	
4.9A		<b>Grading-III</b>					
	(iii)	<b>Aggregate</b>					
		Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	458.22	199600.63	M-036
		<b>Stone Screening</b>					
		Type B 11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	345.52	29852.93	M-041
		OR					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	131.28	13861.86	M-007
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9A (iii)		<b>Using Screening Crushable type such as Moorum or Gravel(Without binding material))</b>					
	(a)	d) Overhead charges @ 0.06 on (a+b+c)				19883.98	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				35128.36	
		Cost for 360 cum = a+b+c+d+e				386411.94	
		Rate per cum = (a+b+c+d+e)/360				1073.37	
					say	<u>1073.00</u>	
		OR					
4.9A (iii)		<b>Using Screening Type-B (11.2mm agg.)(With binding material)</b>					
	(b)	d) Overhead charges @ 0.06 on (a+b+c)				21070.29	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				37224.18	
		Cost for 360 cum = a+b+c+d+e				409466.02	
		Rate per cum = (a+b+c+d+e)/360				1137.41	
					say	<u>1137.00</u>	
		( Anyone of the aggregate grading, screening and binding material may be used as per design)					
4.9		By Mechanical Means:					
SUB ANA -B	B	Unit = cum					

*Calc.*  
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## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Taking output = 360 cum</b>					
		<b>a) Labour</b>					
		Mate	day	0.680	272.00	184.96	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	15.000	257.00	3855.00	L-13
		<b>b) Machinery</b>					
		Motor grader 110 HP @ 50cum/hr. for spreading	hour	7.200	2697.00	19418.40	P&M-032
		Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000	781.00	9372.00	P&M-044
		Water tanker 6 KL capacity	hour	24.000	183.00	4392.00	P&M-060
		<b>c) Material ( Refer table 400 - 7, 8 &amp; 9 )</b>					
4.9B		<b>Grading - I</b>					
	(i)	<b>Aggregate</b>					
		Grading-I 90 mm to 45 mm @ 1.21cum per 10 sqm for compacted thickness of 100 mm	cum	435.600	396.24	172602.14	M-039
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	470.04	45687.89	M-042
		<b>OR</b>					
		Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	131.28	14178.24	M-007
		<b>Binding material</b>					
		Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9B (i)		<b>Using Screening Crushable type such as Moorum or Gravel(Without binding material))</b>					
	(a)	<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				15671.05	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				27685.52	
		Cost for 360 cum = a+b+c+d+e				304540.67	
		<b>Rate per cum = (a+b+c+d+e)/360</b>				845.95	
					<b>say</b>	<b>846.00</b>	
		<b>OR</b>					
4.9B (i)		<b>Using Screening Type-A (13.2mm agg.)(With binding material)</b>					
	(b)	<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				17788.48	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				31426.31	
		Cost for 360 cum = a+b+c+d+e				345689.40	
		<b>Rate per cum = (a+b+c+d+e)/360</b>				960.25	
					<b>say</b>	<b>960.00</b>	
4.9B		<b>Grading - II</b>					
	(ii)	<b>Aggregate</b>					
		Grading-II 63 mm to 45 mm /Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	427.69	186301.76	M-038
		<b>Stone Screening</b>					
		Type A 13.2 mm for grading-II @ 0.12 cum per 10 sqm	cum	57.600	470.04	27074.30	M-042
		<b>OR</b>					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	131.28	13861.86	M-007
		<b>OR</b>					
		Type B11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	345.52	29852.93	M-041
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9B (ii)		<b>Using Screening Crushable type such as Moorum or Gravel(Without binding material))</b>					
	(a)	<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				16474.04	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				29104.14	
		Cost for 360 cum = a+b+c+d+e				320145.52	
		<b>Rate per cum = (a+b+c+d+e)/360</b>				889.29	

## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
					say	<u>889.00</u>	
		OR					
4.9B (ii)		Using Screening Type-A (13.2mm agg.)(With binding material)					
	(b)	d) Overhead charges @ 0.06 on (a+b+c)				17493.64	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				30905.43	
		Cost for 360 cum = a+b+c+d+e				339959.72	
		Rate per cum = (a+b+c+d+e)/360				944.33	
					say	<u>944.00</u>	
4.9B (ii)		Using Screening Type-B (11.2mm agg.)(With binding material)					
	(c)	d) Overhead charges @ 0.06 on (a+b+c)				17660.36	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				31199.96	
		Cost for 360 cum = a+b+c+d+e				343199.60	
		Rate per cum = (a+b+c+d+e)/360				953.33	
					say	<u>953.30</u>	
4.9B		Grading - III					
	(iii)	Aggregate					
		Grading-III 53 mm to 22.4 mm @ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	458.22	199600.63	M-036
		Stone Screening					
		Type B11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	345.52	29852.93	M-041
		OR					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	131.28	13861.86	M-007
		Binding material					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	131.28	3780.86	M-007
		Cost of water	KL	144.000	253.69	36531.36	M-189
4.9B (iii)		Using Screening Crushable type such as Moorum or Gravel(Without binding material)					
	(a)	d) Overhead charges @ 0.06 on (a+b+c)				17271.97	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				30513.82	
		Cost for 360 cum = a+b+c+d+e				335652.00	
		Rate per cum = (a+b+c+d+e)/360				932.37	
					say	<u>932.00</u>	
		OR					
4.9B (iii)		Using Screening Type-B (11.2mm agg.)(With binding material)					
	(b)	d) Overhead charges @ 0.06 on (a+b+c)				18458.29	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				32609.64	
		Cost for 360 cum = a+b+c+d+e				358706.08	
		Rate per cum = (a+b+c+d+e)/360				996.41	
					say	<u>996.00</u>	
4.10	405	Crushed Cement Concrete Sub-base / Base					
SUB ANA -B		Breaking and crushing of material obtained by breaking damaged cement concrete slabs to size range not exceeding 75 mm as specified in table 400.7 transporting the aggregates obtained from breaking of cement concrete slabs at a lead of L km., laying and compacting the same as sub base/ base course, constructed as WBM to clause 404 except the use of screening or binding Material.					
		Unit = cum					
		Taking output = 360 cum					
		a) Labour					
		Mate	day	4.160	272.00	1131.52	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor for crushing broken cement concrete pavement/slabs into aggregate	day	102.000	257.00	26214.00	L-13

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## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>b) Machinery</b>					
		Motor Grader, 110 HP @ 50 cum/hr.	hour	6.000	2697.00	16182.00	P&M-032
		Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000	781.00	9372.00	P&M-044
		Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	720 x L	8.86	6379.20	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				637.92	
		Water tanker 6 KL capacity with 5 km lead @ 1 trip per hour	hour	12.000	183.00	2196.00	P&M-060
		<b>c) Material</b>					
		Material available from dismantled concrete slab after crushing / breaking and only carriage is required to be provided.					
		Cost of water	KL	72.000	253.69	18265.68	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				5355.98	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				9462.23	
		Cost for 360 cum = a+b+c+d+e				104084.53	
		<b>Rate per cum = (a+b+c+d+e)/360</b>				289.12	
		<b>With Smooth 3 wheeled Steel Roller</b>			say	289.00	
		<b>Note</b>					
		1. It is assumed that dismantling of concrete slab/pavement has been considered separately. Hence same is not added in this analysis. Only labour for crushing the dismantled slab into aggregate has been added. Carriage from stock pile to work site has been provided with a lead of L km.					
		2. In case of breaking of slabs is done locally without involvement of transportation, the provision of tipper, front end loader and loading/unloading charges may be deleted.					
4.12	406	<b>Wet Mix Macadam</b>					
SUB ANA -B		Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub-base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.					
		<b>Unit = cum</b>					
		<b>Taking output = 225 cum (495 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	272.00	130.56	L-12
		Mazdoor skilled	day	2.000	325.00	650.00	L-15
		Mazdoor	day	10.000	257.00	2570.00	L-13
		<b>b) Machinery</b>					
		Wet mix plant of 75 tonne hourly capacity	hour	6.600	2791.00	18420.60	P&M-094
		Electric generator 125 KVA	hour	6.000	2637.00	15822.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1373.00	8238.00	P&M-017
		Paver finisher	hour	6.000	1390.00	8340.00	P&M-035
		Smooth 3 wheeled steel roller @ 8-10 tonnes.	hour	12.000	781.00	9372.00	P&M-044
		Water tanker 6 KL capacity	hour	3.000	183.00	549.00	P&M-060
		Tipper	tonne.km	495 x L	8.86	4385.70	Lead =1 km & P&M-047
		<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				438.57	
		<b>c) Material ( Table 400-11)</b>					
		45 mm to 22.4 mm @ 30 per cent	cum	89.100	479.11	42688.70	M-034
		22.4 mm to 2.36 mm @ 40 per cent	cum	118.800	528.14	62743.03	M-031
		2.36 mm to 75 micron @ 30 per cent	cum	89.100	185.94	16567.25	M-022
		Cost of water	KL	18.000	253.69	4566.42	M-189
		<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				11728.91	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				20721.07	
		Cost for 225 cum = a+b+c+d+e				227931.82	
		<b>Rate per cum = (a+b+c+d+e)/225</b>				1013.03	
		<b>With Smooth 3 wheeled Steel Roller</b>			say	1013.00	

## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		<b>Note</b>	1. Though vibratory roller is required only for 3 hours as per norms, the same is required to be available at site for 6 hours to match with other machines. The usage rates of vibratory roller may be multiplied with a factor of 0.65.					
			2. As three wheeled smooth steel rollers are commonly in use, the same has been provided as an alternative which can be used if the thickness of individual layer does not exceed 100 mm.					
12.5	1300		<b>Brick Masonry Work in Cement Mortar 1:2 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.</b>					
SUB ANA -B			<i>Unit = cum</i>					
			<i>Taking output = 5 cum</i>					
			<b>a) Material</b>					
			Bricks 1st class	each	2500.00	6.214	15535.00	M-079
			Cement mortar 1:2 (Rate as in Item 12.6 B sub-analysis)	cum	1.20	3848.00	4617.60	Item 12.6 (B)
			<b>b) Labour</b>					
			Mate	day	0.48	272.00	130.56	L-12
			Mason	day	4.00	345.00	1380.00	L-11
			Mazdoor	day	8.00	257.00	2056.00	L-13
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				4981.02	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2870.02	
			Cost for 5 cum = a+b+c+d				31570.20	
			<b>Rate per cum (a+b+c+d)/5</b>				6314.04	
						<b>say</b>	<b>6314.00</b>	
12.5	1300		<b>Brick Masonry Work in Cement Mortar 1:4 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.</b>					
SUB ANA -B			<i>Unit = cum</i>					
			<i>Taking output = 5 cum</i>					
			<b>a) Material</b>					
			Bricks 1st class	each	2500.00	6.214	15535.00	M-079
			Cement mortar 1:4 (Rate as in Item 12.6 C sub-analysis)	cum	1.20	2473.00	2967.60	Item 12.6 (C)
			<b>b) Labour</b>					
			Mate	day	0.48	272.00	130.56	L-12
			Mason	day	4.00	345.00	1380.00	L-11
			Mazdoor	day	8.00	257.00	2056.00	L-13
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				4634.52	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2670.37	
			Cost for 5 cum = a+b+c+d				29374.05	
			<b>Rate per cum (a+b+c+d)/5</b>				5874.81	
						<b>say</b>	<b>5875.00</b>	
12.5	1300		<b>Brick Masonry Work in Cement Mortar 1:6 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.</b>					
SUB ANA -B			<i>Unit = cum</i>					
			<i>Taking output = 5 cum</i>					
			<b>a) Material</b>					
			Bricks 1st class	each	2500.00	6.214	15535.00	M-079
			Cement mortar 1:6 (Rate as in Item 12.6 D sub-analysis)	cum	1.20	1929.00	2314.80	Item 12.6 (D)
			<b>b) Labour</b>					
			Mate	day	0.48	272.00	130.56	L-12
			Mason	day	4.00	345.00	1380.00	L-11
			Mazdoor	day	8.00	257.00	2056.00	L-13
			<b>c) Overhead charges @ 0.21 on (a+b)</b>				4497.44	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2591.38	
			Cost for 5 cum = a+b+c+d				28505.18	
			<b>Rate per cum (a+b+c+d)/5</b>				5701.04	

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## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
					say	5701.00	
3.19	305.3.4	Rolling, watering and compaction with Smooth Wheeled Roller					
SUB ANA -B		Unit = cum					
		Taking output = 600 cum					
		a) Labour					
		Mate	day	0.120	272.00	32.64	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		b) Machinery					
		Water tanker 6 KL capacity	hour	4.000	183.00	732.00	P&M-060
		Smooth wheel roller 8-10 tonnes @ 56 cum per hour	hour	10.710	781.00	8364.51	P&M-044
		c) Material					
		Cost of water	KL	24.000	253.69	6088.56	M-189
		d) Overhead charges @ 0.06 on (a+b+c)				959.32	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1694.80	
		Cost for 600 cum = a+b+c+d+e				18642.84	
		Rate per cum = (a+b+c+d+e)/600				31.07	
					say	31.10	
13.9	710.1.4. of IRC:78 & 2200	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical Specification					
		Unit = cum					
		Taking output = 10 cum					
	B	Sandy material					
		a) Labour					
		Mate	day	0.28	272.00	76.16	L-12
		Mazdoor for filling, watering, ramming etc.	day	7.00	257.00	1799.00	L-13
		b) Material					
		Sand (Coarse)	cum	12.00	150.80	1809.60	M-004
		c) Machinery					
		Plate compactor/power rammer	hour	2.50	467.00	1167.50	P&M-086
		Water Tanker	hour	0.06	183.00	10.98	P&M-060
		d) Overhead charges @ 0.21 on (a+b+c)				1021.28	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				588.45	
		Cost for 10 cum of sandy backfill = a+b+c+d+e				6472.97	
		Rate per cum = (a+b+c+d+e)/10				647.30	
					say	647.00	
8.44	suggestive	Permanent Type Barricade in Construction Zone					
	C	With FLY ASH Bricks					
		Construction of a permanent type barricade made with brick work in mud mortar, 1.5 m high, 4 m long, 600 mm thick, plastered with cement mortar 1:6, painted with yellow and white strips					
		Unit = each					
		Taking output = one barricade					
		a) Labour					
		Mate	day	0.240	272.00	65.28	L-12
		Mazdoor	day	3.000	257.00	771.00	L-13
		Painter	day	1.000	326.00	326.00	L-18
		Mason	day	2.000	345.00	690.00	L-11
		b) Material					
		Brick	each	1800.000	5.008	9014.40	M-198
		Cement	kg	22.000	5.156	113.43	M-081 /1000
		Sand	cum	0.090	150.80	13.57	M-005
		Paint	litre	1.250	219.05	273.81	M-131
		c) Overhead charges @ 0.06 on (a+b)				676.05	
		d) Contractor's profit @ 0.1 on (a+b+c)				1194.35	
		Rate per barricade = a+b+c+d				13137.90	
					say	13138.00	



## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
11.14		New	Half Brick Circular Tree Guard, in 2nd Class Brick, internal diameter 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground: With FLY ASH Bricks					
			Half brick circular tree guard, in 2nd class brick, internal diameter 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground, bottom two courses laid dry, and top three courses in cement mortar 1:6 (1 cement 6 sand) and the intermediate courses being in dry honey comb masonry, as per design complete					
			Unit = Each					
			Taking output = one tree guard					
			a) Labour					
			Mate	day	0.050	272.00	13.60	L-12
			Mason	day	0.250	345.00	86.25	L-11
			Mazdoor	day	0.250	257.00	64.25	L-13
			b) Material					
			Brick 2nd class including carriage	each	230.000	5.008	1151.84	M-198
			Cement mortar 1:6	cum	0.025	1929.00	48.23	Item 12.6 (D)
			c) Overhead charges @ 0.06 on (a+b)				81.85	
			d) Contractor's profit @ 0.1 on (a+b+c)				144.60	
			Rate per tree Guard = a+b+c+d				1590.62	
						say	1591.00	
11.15		New	Edging with 2nd Class Bricks, Laid Dry Lengthwise: With FLY ASH Bricks					
			Edging with 2nd class bricks, laid dry lengthwise, including excavation, refilling, consolidation, with a hand packing and spreading nearly surplus earth within a lead of 50 metres					
			Unit = Metre					
			Taking output= 10 metres					
			a) Labour					
			Mate	day	0.002	272.00	0.54	L-12
			Mason	day	0.050	345.00	17.25	L-11
			Mazdoor	day	0.050	257.00	12.85	L-13
			b) Material					
			Brick 2nd class including carriage	each	50.000	5.008	250.40	M-198
			c) Overhead charges @ 0.06 on (a+b)				16.86	
			d) Contractor's profit @ 0.1 on (a+b+c)				29.79	
			Cost for 10 metre = a+b+c+d				327.70	
			Rate per metre = (a+b+c+d)/10				32.77	
						say	32.80	
12.5	1300		Brick Masonry Work in Cement Mortar 1:2 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications: With FLY ASH Bricks					
SUB ANA -C			Unit = cum					
			Taking output = 5 cum					
			a) Material					
			Bricks 1st class	each	2500.00	5.008	12520.00	M-198
			Cement mortar 1:2 (Rate as in Item 12.6 B sub-analysis)	cum	1.20	3848.00	4617.60	Item 12.6 (B)
			b) Labour					
			Mate	day	0.48	272.00	130.56	L-12
			Mason	day	4.00	345.00	1380.00	L-11
			Mazdoor	day	8.00	257.00	2056.00	L-13
			c) Overhead charges @ 0.21 on (a+b)				4347.87	
			d) Contractor's profit @ 0.1 on (a+b+c)				2505.20	
			Cost for 5 cum = a+b+c+d				27557.24	
			Rate per cum (a+b+c+d)/5				5511.45	
						say	5511.00	
12.5	1300		Brick Masonry Work in Cement Mortar 1:3 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications: With FLY ASH Bricks					
			Unit = cum					
			Taking output = 5 cum					
			a) Material					
			Bricks 1st class	each	2500.00	5.008	12520.00	M-198

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## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
		Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.20	3030.00	3636.00	Item 12.6 (A)
		<b>b) Labour</b>					
		Mate	day	0.48	272.00	130.56	L-12
		Mason	day	4.00	345.00	1380.00	L-11
		Mazdoor	day	8.00	257.00	2056.00	L-13
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				4141.74	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2386.43	
		Cost for 5 cum = a+b+c+d				26250.73	
		<b>Rate per cum (a+b+c+d)/5</b>				5250.15	
					<b>say</b>	<b>5250.00</b>	
12.5	1300	Brick Masonry Work in Cement Mortar 1:4 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications : With FLY ASH Bricks					
SUB ANA -C		Unit = cum					
		Taking output = 5 cum					
		<b>a) Material</b>					
		Bricks 1st class	each	2500.00	5.008	12520.00	M-198
		Cement mortar 1:4 (Rate as in Item 12.6 C sub-analysis)	cum	1.20	2473.00	2967.60	Item 12.6 (C)
		<b>b) Labour</b>					
		Mate	day	0.48	272.00	130.56	L-12
		Mason	day	4.00	345.00	1380.00	L-11
		Mazdoor	day	8.00	257.00	2056.00	L-13
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				4001.37	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2305.55	
		Cost for 5 cum = a+b+c+d				25361.09	
		<b>Rate per cum (a+b+c+d)/5</b>				5072.22	
					<b>say</b>	<b>5072.00</b>	
12.5	1300	Brick Masonry Work in Cement Mortar 1:6 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications: With FLY ASH Bricks					
SUB ANA -C		Unit = cum					
		Taking output = 5 cum					
		<b>a) Material</b>					
		Bricks 1st class	each	2500.00	5.008	12520.00	M-198
		Cement mortar 1:6 (Rate as in Item 12.6 D sub-analysis)	cum	1.20	1929.00	2314.80	Item 12.6 (D)
		<b>b) Labour</b>					
		Mate	day	0.48	272.00	130.56	L-12
		Mason	day	4.00	345.00	1380.00	L-11
		Mazdoor	day	8.00	257.00	2056.00	L-13
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				3864.29	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2226.56	
		Cost for 5 cum = a+b+c+d				24492.21	
		<b>Rate per cum (a+b+c+d)/5</b>				4898.44	
					<b>say</b>	<b>4898.00</b>	
13.1	1300 & 2200	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and Technical Specifications : With FLY ASH Bricks					
		Unit = cum					
		Taking output = 1 cum					
		<b>a) Material</b>					
		Bricks 1st class	each	500.00	5.008	2504.00	M-198
		Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	0.24	3030.00	727.20	Item 12.6 (A)
		<b>b) Labour</b>					
		Mate	day	0.06	272.00	16.32	L-12
		Mason	day	0.80	345.00	276.00	L-11
		Mazdoor	day	0.80	257.00	205.60	L-13
		Add for scaffolding @ 5 per cent of cost of material and labour				186.46	
		<b>c) Overhead charges @ 0.21 on (a+b)</b>				822.27	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				473.78	
		<b>Rate per cum (a+b+c+d)</b>				5211.63	
					<b>say</b>	<b>5212.00</b>	

## SUB-ANALYSIS\_B

Sr. No.	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate (₹)	Cost (₹)	Remarks/ Input ref.
5.11A	512		<b>Close Graded Premix Surfacing/Mixed Seal Surfacing</b>					
		<b>Case I</b>	Mechanical means using HMP of appropriate capacity not less than 75 tonnes/hour.					
			Providing, laying and rolling of close-graded premix surfacing material of 20 mm thickness composed of 11.2 mm to 0.09 mm (Type-A) or 13.2 mm to 0.09 mm (Type-B) aggregates using penetration grade bitumen to the required line, grade and level to serve as wearing course on a previously prepared base, including mixing in a suitable plant, laying and rolling with a Smooth wheeled roller 8-10 tonne capacity, and finishing to required level and grade.					
			<b>Unit = sqm</b>					
			<b>Taking output = 10250 sqm (205 cum)</b>					
			<b>a) Labour</b>					
			Mate	day	0.840	272.00	228.48	L-12
			Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	257.00	4112.00	L-13
			Skilled mazdoor for checking line & levels	day	5.000	325.00	1625.00	L-15
			<b>b) Machinery</b>					
			i) HMP of appropriate capacity - 75 t per hour	hour	6.000	39088.00	234528.00	P&M-022
			ii) Electric Generator Set 250 KVA	hour	6.000	3691.00	22146.00	P&M-081
			iii) Front end loader 1 cum bucket capacity	hour	6.000	1373.00	8238.00	P&M-017
			iv) Tipper 10 tonne capacity	tonne.km	450 x L	8.86	3987.00	Lead = 1 km & P&M-047
			<b>Add 10 per cent of cost of carriage to cover cost of loading and unloading</b>				<b>398.70</b>	
			v) Paver finisher hydrostatic with mechanical attachment	hour	6.000	1390.00	8340.00	P&M-035
			iv) Smooth wheeled 8-10 tonnes weight	hour	6.000	781.00	4686.00	P&M-044
			<b>c) Material</b>					
			<b>Type - A</b>					
			* Bitumen @ 22 kg per 10 sqm	tonne	22.500	32830.00	738675.00	M-074
			Stone crushed aggregates 11.2 mm to 0.09 @ 0.27 cum per 10 sqm	cum	276.750	345.52	95622.66	M-041
			<b>or</b>					
			<b>Type - B</b>					
			Bitumen @ 19 kg per 10 sqm	tonne	19.480	32830.00	639528.40	M-074
			Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	276.750	470.04	130083.57	M-042
			<b>d) Overhead charges @ 0.06 on (a+b+c)</b>				63474.07	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				112137.52	
			Cost for 10250 sqm = a+b+c+d+e				1233512.74	
			<b>Rate per sqm = (a+b+c+d+e)/10250</b>				120.34	
			<b>For Type 'B'</b>			<b>say</b>	<b>120.00</b>	
			* Any one of the alternative may be adopted					
12.7 (Add)	1400		<b>Stone masonry work in cement mortar 1:6 in foundation complete as drawing and Technical Specification</b>					
			<b>Unit = cum</b>					
			<b>Taking output = 5 cum</b>					
	1405.3		<b>B) Random Rubble Masonry</b>					
			( coursed/uncoursed )					
			<b>Unit = cum</b>					
			<b>Taking output = 5 cum</b>					
			<b>a) Material</b>					
			Stone	cum	5.50	288.85	1588.68	M-148
			Through and bond stone	Nos	35.00	10.48	366.80	M-182
			(35nos.x0.24mx0.24mx0.39m = 0.79 cu.m)					
			Cement mortar 1:6 (Rate as in item 12.6 D)	cum	1.55	1929.00	2989.95	Item 12.6D
			<b>b) Labour</b>					
			Mate	day	0.62	272.00	168.64	L-12
			Mason	day	6.00	345.00	2070.00	L-11
			Mazdoor	day	9.00	257.00	2313.00	L-13
			<b>c) Overheads @ 0.21 on (a+b)</b>				1994.38	
			<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1149.14	
			Cost for 5 cum = a+b+c+d				12640.59	
			<b>Rate per cum (a+b+c+d)/5</b>				2528.12	
						<b>say</b>	<b>2528.00</b>	
	@		The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.					

Calc.  
12/8/19





Round about at CH 20 + 150 of Mohammadpur-Chapra (SH-90) Road