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**GOVERNMENT OF BIHAR**

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Effective from : 01.04.2013  
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**Schedule of Rates with**

**ROAD CONSTRUCTION DEPARTMENT**  
(Edition - Eighth)  
**(INCLUDING NATIONAL HIGHWAY WING)**

Effective f

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# **ROAD CONSTRUCTION DEPARTMENT BIHAR**

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BIHAR, PATNA**

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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, 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 सडक परिवहन एवं राजमार्ग मंत्रालय भारत सरकार के स्टैण्डर्ड डाटा बुक के आधार पर किया जायेगा तथा 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, जल संसाधन विभाग, बिहार, पटना	सदस्य
(v)	अभियंता प्रमुख, लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना	सदस्य
(vi)	मुख्य अभियंता (असैनिक), बिहार राज्य विद्युत बोर्ड, पटना	सदस्य
(vii)	अभियंता प्रमुख, तकनीकी परीक्षक कोषांग, निगरानी विभाग, बिहार, पटना	सदस्य
(viii)	परियोजना संयोजक, नलकूप प्रभाग, लघु जल संसाधन विभाग, बिहार, पटना	सदस्य
(ix)	मुख्य अभियंता, ऊर्जा विभाग, बिहार, पटना	सदस्य

बिहार लोक निर्माण संहिता की कण्डिका 103 में संशोधन के आलोक में MORT&H DATA BOOK एवं Software पर आधारित पथ निर्माण विभाग (राष्ट्रीय उच्च पथ सहित) के लिए अनुसूचित दर का

प्रथम संस्करण	— 05.12.2006
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

से लागू किया गया था। समिति द्वारा पथ निर्माण विभाग (राष्ट्रीय उच्च पथ सहित) के लिए दिनांक 23.05.2007 से प्रभावी अनुसूचित दर पुस्त (दर विश्लेषण सहित) — द्वितीय संस्करण में आवश्यक संशोधन एवं पुनरीक्षण के पश्चात् इसके तृतीय संस्करण एवं तृतीय संस्करण में आवश्यक संशोधन एवं पुनरीक्षण के पश्चात् इसके चतुर्थ संस्करण का अनुमोदन किया गया था। समिति द्वारा पंचम संस्करण में आवश्यक संशोधन एवं पुनरीक्षण के पश्चात् इसके षष्ठम् संस्करण का अनुमोदन किया गया था। समिति द्वारा षष्ठम् संस्करण में आवश्यक संशोधन एवं पुनरीक्षण के पश्चात् इसके सप्तम् संस्करण दिनांक-01.07.2012 से प्रकाशित हुआ।

अष्टम् संस्करण के प्रकाशित करने के लिए राज्य अनुसूचित दर निर्धारण समिति की बैठक दिनांक-13.03.13 को आमंत्रित की गई जिसमें निम्नलिखित सदस्य भाग लिये :-

(i)	अभियंता प्रमुख, पथ निर्माण विभाग, बिहार, पटना	संयोजक
(ii)	अभियंता प्रमुख, जल संसाधन विभाग, बिहार, पटना	सदस्य
(iii)	अभियंता प्रमुख, लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना	सदस्य
(iv)	अभियंता प्रमुख, तकनीकी परीक्षक कोषांग, निगरानी विभाग, बिहार, पटना	सदस्य
(v)	परियोजना संयोजक, नलकूप प्रभाग, लघु जल संसाधन विभाग, बिहार, पटना	सदस्य
(vi)	मुख्य अभियंता, ऊर्जा विभाग, बिहार, पटना	सदस्य
(vii)	अभियंता प्रमुख, ग्रामीण कार्य विभाग, बिहार, पटना	पद रिक्त
(viii)	अभियंता प्रमुख, भवन निर्माण विभाग, बिहार, पटना	पद रिक्त
(ix)	मुख्य अभियंता (असैनिक), बिहार राज्य विद्युत बोर्ड, पटना	मुख्यालय से बाहर

दिनांक-13.03.2013 के बैठक में उपस्थित सभी सदस्यों द्वारा कुछ संशोधन के साथ अनुसूचित दर पुस्तिका को दिनांक-01.04.2013 से प्रकाशित करने में अपनी सहमति दी (बैठक की कार्यवाही संलग्न)

पथ निर्माण के क्षेत्र में आए नये तकनीक को देखते हुए इस अनुसूचित दर पुस्तिका में Cat's eye, Paver block, Stone kerb, एवं Elastomeric bearing के मद को शामिल किया गया है। साथ ही साथ, पर्यावरण के दृष्टिकोण से Fly Ash के उपयोगिता को ध्यान में रखते हुए उसके दर को अद्यतन किया गया है।

इस पुस्तिका के प्रकाशन के पश्चात भी समय-समय पर निर्माण सामग्री यथा बिटुमेन, सीमेंट, स्टील इत्यादि के दरों में आयी कमी-बेसी को देखते हुए लगभग प्रत्येक माह राज्य स्तरीय अनुसूचित दर समिति की बैठक होती है जिसमें उनके दर का 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 की कण्डिका 103 के संशोधन के पश्चात MORT&H data book एवं Software पर आधारित अनुसूचित दर का यह अष्टम् संस्करण है। यद्यपि यह सभी सदस्यों की देख-रेख में तैयार किया गया है, फिर भी ऐसी संभावना है कि इस अनुसूचित दर 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 को जानकारी में E-mail [ID-sorrcd2012@gmail.com](mailto:ID-sorrcd2012@gmail.com)., द्वारा या पत्र द्वारा या दूरभाष-(0612) 2545514 द्वारा अथवा मो0- 9431115443 पर या व्यक्तिगत रूप से अविलम्ब दी जाय ताकि सम्यक विचारोपरान्त उन त्रुटियों का समुचित निराकरण किया जा सके।

चूँकि यह दर विश्लेषण सडक 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 विशिष्ट का गहन अध्ययन अवश्य किया जाय।

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

1. ई0 आनन्द किशोर प्रसाद, अधीक्षण अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग पटना।
2. ई0 आर0 के0 नन्द, तकनीकी सलाहकार, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग पटना।
3. ई0 सबिता सिन्हा, कार्यपालक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
4. ई0 सुनील कुमार सिन्हा, कार्यपालक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
5. ई0 नलिन विलोचन, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग पटना।
6. ई0 बिरेन्द्र कुमार, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग पटना।
7. ई0 प्रभात कुमार, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
8. ई0 रूबी रानी, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
9. ई0 राघवेन्द्र प्रसाद लाल, सहायक अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
10. ई0 राज कुमार राय, कनीय अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
11. ई0 प्रमोद प्रसाद, कनीय अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
12. ई0 निरंजन कुमार, कनीय अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
13. ई0 ललित प्रसाद गुप्ता, कनीय अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
14. ई0 संध्या रानी, कनीय अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
15. ई0 अशोक कुमार, कनीय अभियंता, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
16. श्री प्रशांत कुमार, सहायक, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
17. श्री मो0 कमालउद्दीन अशरफ, सहायक, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।
18. श्री राजेश कुमार, सहायक, मुख्यालय निरूपण अंचल, पथ निर्माण विभाग, पटना।

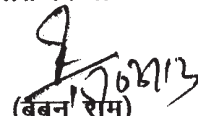
राज्य स्तरीय अनुसूचित दर निर्धारण समिति द्वारा बिहार राज्य पुल निर्माण निगम के प्रबंध निदेशक श्री देव नारायण प्रसाद, यांत्रिक उपभाग के अधीक्षण अभियंता श्री अशोक कुमार एवं कार्यपालक अभियंता श्री अवध बिहारी सिंह के प्रति आभार व्यक्त करता है जिनके सहयोग एवं रचनात्मक सुझाव से इस पुस्तक के प्रकाशन में विशेष सहयोग मिला है।

पथ निर्माण विभाग के सचिव, श्री प्रत्यय अमृत के प्रति मैं राज्य स्तरीय अनुसूचित दर समिति के सभी सदस्यों एवं सहयोगी अभियंताओं की ओर से कृतज्ञता व्यक्त करता हूँ जो इस संस्करण का यथाशीघ्र प्रकाशन हेतु हमेशा प्रकाश पुँज की भाँति मार्गदर्शन एवं प्रेरणा देते रहे हैं।

अनुसूचित दर पुस्त के उपयोग करनेवालों के विशेष सुविधा के लिए इस अनुसूचित दर पुस्तक के साथ इस वर्ष इसका soft copy 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 01.04.2013 से प्रकाशित किया जाता है।

स्थान-पटना  
दिनांक-

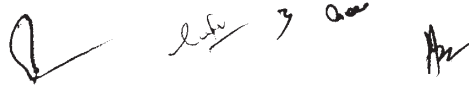
  
(बबन राम)  
संयोजक

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

**MORT&H Data Book एवं इसके सॉफ्टवेयर पर आधारित पथ निर्माण विभाग (राष्ट्रीय उच्च पथ सहित) के लिये अनुसूचित दर पुस्तिका (दर विश्लेषण सहित) के अष्टम् 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 ज्ञापक 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 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 01.04.2013 से प्रभावी) के पुनरीक्षण के लिए दिनांक 13.03.2013 की बैठक में निर्माण सामग्री, श्रम 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 01.07.2012 से प्रभावी अनुसूचित दर पुस्त (दर विश्लेषण सहित) - सप्तम् संस्करण में आवश्यक संशोधन एवं पुनरीक्षण के पश्चात् इसके अष्टम् संस्करण 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 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 Overhead Charges निम्न प्रकार से लिये गये हैं :-
  - (a) Chapter 1 से 11 तक में 50 Crores तक के Road Projects के लिए overhead charges 10% लिया गया है।
  - (b) Chapter 12 से 15 में Major Bridges के लिए overhead charges 25% लिया गया है।
  - (c) Chapter 16 में Repair & Rehabilitation Work में overhead charges 30% लिया गया है।
- (iii) राष्ट्रीय राजमार्ग एवं भूतल परिवहन मंत्रालय के लिए लागू डाटा बुक में दिये गये Guideline for Road & Bridges के अनुसार Road Works के लिए Rs. 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। 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 10% एवं CP 10% के आधार पर दर किया गया है, इसमें Multiplying Factor लागू नहीं होगा।
    - (b) यदि Road project का cost 50 Crores से ज्यादा हो तो overhead charges 8% एवं CP 10% देय होने के कारण (a) के दर में Multiplying Factor 0.982 होगा।
  - (B)
    - (a) Chapter 12 से 15 तक Major Bridge including state of Art Bridge और Minor Bridge के लिए overhead charge 25% 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 25% एवं CP 10% है) का इस्तेमाल 50 करोड़ रुपये के लागत के अन्तर्गत पथ परियोजनाओं (जिसमें OH 10% एवं CP 10% देय होगा) के लिये उपयोग में लायी जाती है, तो उक्त मद के दर में Multiplying Factor 0.88 होगा।
    - (c) Chapter 12 से 15 का मद (जिसमें OH 25% एवं CP 10% है) का इस्तेमाल 50 करोड़ रुपये से अधिक लागत के पथ परियोजनाओं (जिसमें OH 8% एवं CP 10% देय होगा) के लिये उपयोग में लायी जाती है, तो उक्त मद के दर में Multiplying Factor 0.864 होगा।
    - (d) Chapter 12 से 15 का मद (जिसमें OH 25% एवं CP 10% है) का इस्तेमाल minor bridges included in Road Project (जिसमें OH 20% एवं CP 10% देय होगा) के लिये उपयोग में लायी जाती है, तो उक्त मद के दर में Multiplying Factor 0.96 होगा।



- (C) Chapter 16 में Repair & Rehabilitation Work of Bridge में Over head charge 30% एवं CP 10% के आधार पर दर तैयार किया गया है, इसमें Multiplying Factor लागू नहीं होगा।
- (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 Fe500 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 M.S 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) Brick 100 "A" का दर पटना Urban के लिये लागू दर को व्यवहार में लाया गया है।
- (v) (a) Coarse Sand के दर में खादान के दर को व्यवहार में लाया गया है। जहाँ पर Coarse Sand at Doriganj economical हो वहाँ पर इसे ही व्यवहार में लाया जाय तथा दर में अन्तर की राशि को घटाया या जोड़ा जाए।

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। इस 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 एवं VIZAG से प्राप्त दर पर राज्य स्तरीय अनुसूचित दर निर्धारण समिति द्वारा विचार विमर्श कर अनुमोदित करने का निर्णय लिया गया। इन्हीं तीन कंपनियों के स्टील का प्रयोग निर्माण कार्यों में किया जाना है।
- (vi) विश्लेषित दर में सभी तरह के Taxes, Royalty शामिल है।
- (a) Royalty का प्रावधान खनन- विभाग की अधिसूचना सं०- 245, पटना दिनांक Jan 2012, तथा खान एवं भूतत्व विभाग के अधिसूचना सं० पटना 250 दिनांक 27 January 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 जिम्मेदारी क्षेत्रीय पदाधिकारियों की होगी।
- (b) MORD (Ministry of Rural development ) के अनुसार Basic Approach and general Conditions and assumptions for the Preparation of Standard Data Book के Page No- BA-2 पर Sales / turn over tax को इस प्रकार वर्णित किया गया है:-  
 "Sales/turnover tax has been assumed at 4%. In case this tax is more than 4%, the percentage of overheads should be increased correspondingly for such states."  
 जिसके क्रम से संयोजक सह अभियंता प्रमुख, पथ निर्माण विभाग के पत्रांक -39 पटना दिनांक-31.05. 2010 के द्वारा इस प्रकार उल्लेखित किया गया है "चूकी overhead charges में 4% vat सन्निहित रहता है। यदि Vat 4% से अधिक देय होता है तो Vat का अतिरिक्त प्रतिशत को दर में जोड़ दिया जाय।" उपरोक्त तथ्यों के आलोक में समिति द्वारा यह निर्णय लिया गया कि निर्माण सामग्रियों के दर में 4% से अधिक Vat /sales Tax रहने के Condition में MORTH Data Book में दिये गये Overhead Charges को ही यथावत् रहने दिया जाय तथा क्षेत्रीय पदाधिकारी समय-समय पर वाणिज्यकर विभाग,



बिहार द्वारा निर्गत/ निर्धारित Vat / Sale tax के अनुपालन के आलोक में निर्माण सामग्रियों (4% से अतिरिक्त Vat / Sale tax को सामग्रियों के दर में जोड़ते हुये ) का दर विश्लेषण कर तकनीकी एवं वित्तीय मामलों का निष्पादन करेंगे ।

(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 वित्त विभाग, बिहार सरकार के पत्रांक 4984 दिनांक-01.10.2008 एवं संयोजक सह अभियंता प्रमुख के पत्रांक 37(अनु) दिनांक 13.05.2010 के द्वारा दिये गये निर्देश का अनुपालन सुनिश्चित करने की जिम्मेदारी 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 जांचोपरांत व्यवहार में लायेंगे। Route Chart की छाया प्रति इस अनुसूचित दर पुस्त में संलग्न कर दी गई है।

(a) MORT&H 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 जहां 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 item) का दर विश्लेषण दिया 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 over head charges (10%) include कर दिया गया है।

1. बिटुमेन से संबंधित दर :-

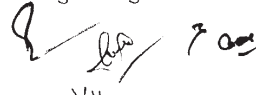
अनुसूचित दर के पुनरीक्षण के क्रम में राष्ट्रीयकृत कम्पनी Indian Oil Corporation एवं Hindustan Petroleum Corporation से दर प्राप्त हुआ है। EMULSION का दर HP-HINCOL कंपनी से प्राप्त किया गया। समिति द्वारा इन कम्पनियों से प्राप्त दर में VAT को घटाकर विभिन्न Grades के Bitumen का दर अनुमोदित करने का निर्णय लिया गया। समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, संलग्न अनुसूची "M4" के अनुसार बिटुमेन के विभिन्न Grades/प्रकार के दर को अनुमोदित किया जाता है।

2. सिमेंट का दर :-

- (i) **Ordinary Portland Cement :- Ordinary Portland Cement (43 Grade)** का दर विभिन्न कंपनियों से प्राप्त हुआ है। इस दर में शामिल VAT 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 जाता है।
- (ii) **Ordinary Portland Cement (33 Grade)** का दर विभिन्न कंपनियों से प्राप्त हुआ है। इस दर में शामिल VAT 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 दरों का गणना किया गया। समिति के द्वारा इसपर विस्तार से विचार-विमर्श किया गया तथा इसे अनुमोदित करने का निर्णय लिया गया। समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, संलग्न अनुसूची "M2" के दर को अनुमोदित किया जाता है।
- (iii) **Portland Pozolona Cement :- Portland Pozolona Cement** का दर विभिन्न कंपनियों से प्राप्त हुआ है। इस दर में शामिल VAT 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 जाता है।
- (iv) **Portland Slag Cement :- Portland Slag Cement** का दर विभिन्न कंपनियों से प्राप्त हुआ है। इस दर में शामिल VAT 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 जाता है।

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 VAT के समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, अनुसूची "M5" के अनुसार अनुमोदित करने का निर्णय लिया जाता है।
- b. **Wire rod in coil :-** Wire rod in coil के भिन्न भिन्न व्यास का दर VIZAG से प्राप्त हुआ है। इसपर समिति के सदस्यों द्वारा विचार-विमर्श किया गया तथा VIZAG से प्राप्त दर बिना VAT के समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, अनुसूची "M6" के अनुसार अनुमोदित करने का निर्णय लिया जाता है।
- c. **Steel Channel का दर :-** Steel Channel का दर VIZAG से प्राप्त हुआ है, तदनुसार VIZAG से प्राप्त न्यूनतम दर बिना VAT के समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, अनुसूची "M8" के अनुसार अनुमोदित करने का निर्णय लिया जाता है।
- d. **Steel Angles का दर :-** भिन्न-भिन्न आकार वाले Steel Angles का दर VIZAG से प्राप्त हुआ है। तदनुसार VIZAG से प्राप्त न्यूनतम दर बिना VAT के समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, Schedule "M9" के अनुसार अनुमोदित करने का निर्णय लिया जाता है।
- e. **TMT Bar (Fe500) का दर :-** TMT Bar का दर TATA, VIZAG एवं SAIL से प्राप्त हुआ है। TATA, VIZAG एवं SAIL से प्राप्त न्यूनतम दर बिना VAT के समिति के द्वारा सर्वसम्मति से पूर्णविचारोपरान्त, Schedule "M10A" के अनुसार अनुमोदित करने का निर्णय लिया जाता है।





- 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 99 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-094, तथा WMM Paver finisher, Tipping Truck 14cum, 6.5KVA Generator, vibratory Earth Compactor, Tractor (25HP) का दर का पुनरीक्षण यांत्रिक उपभाग, पथ निर्माण विभाग से प्राप्त प्रस्ताव के अनुसार राज्य स्तरीय अनुसूचित दर निर्धारण समिति की दिनांक-16.11.12 की बैठक में अनुमोदित करने का निर्णय लिया गया था। शेष मशीनों के मदों के Usage Charges का दर जो 2006 से अबतक अपुनरीक्षित थे, के पुनरीक्षण हेतु यांत्रिक उपभाग, पथ निर्माण विभाग, बिहार राज्य पुल निर्माण निगम, पटना/लोक स्वास्थ्य अभियंत्रण विभाग/जल संसाधन विभाग तथा भवन निर्माण विभाग, बिहार, पटना को अनेको बार लिखित एवं मौखिक अनुरोध के बावजूद भी दर प्राप्त नहीं होने के कारण कार्यहित में पूर्व प्रधान सचिव श्री आर० के० सिंह द्वारा सचिका सं०-मु०नि० (पथ-०८/२००६)(पृष्ठ 10 से 12) में दिये गये निदेश के आलोक में Plant & Machinery के शेष मदों ( P&M-003, P&M-009 एवं P&M-047 को छोड़कर) का दर पुनरीक्षण किया गया है। इसमें Usage Charges के दर में इसके विभिन्न Components यथा Ownership Charges, Operational Charges, POL Charges & Establishment Charges का प्रभाव क्रमशः 20%, 30%,25% एवं 25% मानते हुए इन विभिन्न Components के RBI Price Index में 2006 से 2012-13 के बीच बढ़ोत्तरी के अनुसार Usage Charges के दर में weighted mean बढ़ोत्तरी की गणना की गई है।

उक्त गणना से आकलित Usage Charges में 2006-07 के दर में औसतन 56.80% की वृद्धि शेष मशीनरी मदों ( P&M-003, P&M-009 एवं P&M-047 को छोड़कर) के Usage Charges में 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 रू० 2325 प्रति घंटा के आधार पर उनके Outputके अनुरूप Pro-rata basis से  $2325 \times (13/20) = \text{Rs.}1511.25/\text{hr}$  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 रू० 174 प्रति घंटा के आधार पर उनके Output के अनुरूप Pro-rata basis से  $(174 \times 2.5/7.5) = \text{Rs.}58/\text{hr}$  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 सं०-26 (अनु०) दिनांक-04.02.13 के माध्यम से अनुरोध किया गया है।

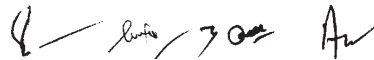
#### P&M-047 Tipper 5cum का Tonne-km दर

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 2012-13 में per hr per tipper(5 cum capacity) दर Rs. 787.00

वर्ष 2012-13 में पुनरीक्षित दर Per tonne-km में Rs. 787 x 1.74/200= Rs 6.85

P&M-047 Tipper (5cum capacity) के लिये उक्त तरीके से प्राप्त per Tonne-km दर Rs 6.85 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 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 जाता है।

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

पथ निर्माण विभाग, बिहार, पटना के पत्रांक 93(अनु0), पटना दिनांक 01.10.2012 द्वारा निर्गत पत्र के आलोक में ईट एवं ईट से संबंधित निर्माण सामग्रियों की दर को यथावत् रखने पर सर्वसम्मति से सदस्यों द्वारा निर्णय लिया जाता है।

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

पथ निर्माण विभाग (राष्ट्रीय उच्च पथ सहित) के लिए दिनांक-01.4.2013 से प्रभावी अनुसूची दर में व्यवहृत स्टोन बोल्टर, मेटल्स एवं विभिन्न आकार के चीप्स के दरों को पूर्व में राज्य अनुसूची दर निर्धारण समिति के द्वारा लिए गये निर्णय (पत्रांक-38, दिनांक-11.06.2012) के आलोक में स्टोन चीप्स को RBI, WHOLE SALE PRICE INDEX द्वारा निर्गत मूल्य सूचकांक में NON- METALLIC MINERALS के अंतर्गत रखा गया है। इसी आधार पर Aggregates के लिये Price Indexing June 2012 से December 2012 तक के लिए किया गया है। Price Index में Growth 1.36% है इस आधार पर Aggergate का दर M-01 से M-55 के दर में तदनुसार पूर्णविचारोपरान्त अनुसूची "Schedule-M/MORTH-1" के अनुसार सदस्यों द्वारा अनुमोदित करने का निर्णय लिया जाता है।


**8. 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 सं0-531, दिनांक-05.10.2012 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 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।

**9. Fly Ash Carraige के संबंध में :-**

Fly Ash का Physical Property Sand के अनुरूप है। इसलिये Fly Ash का Carraige Cost Sand के अनुरूप ही समिति के सदस्यों द्वारा सर्वसम्मति से पूर्णविचारोपरान्त अनुमोदित करने का निर्णय लिया गया।

**10.1 MORT&H 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 whole sale price index के आधार पर अद्यतन दरों का निर्धारण किया गया है। Item no. M-72, M-87, M-88, M-101, M-102, M-103, M-119, M-123, M-124, M-125, M-130, M-173, M-174, M-175, M-176, M-177, M-191, एवं M-192 के दरों में बढ़ोत्तरी RBI द्वारा निर्गत Steel के Price Indexing के आधार पर किया गया है। वर्ष 2010 के मई महीने का सूचकांक 113 था एवं दिसम्बर 2012 का सूचकांक 126.2 है। उपरोक्त मदों में बढ़ोत्तरी 11.68 प्रतिशत की हुयी है। M-59, M-60, एवं M-61 के दरों में बढ़ोत्तरी RBI द्वारा निर्गत Aluminium के Price Indexing के आधार पर किया गया है। वर्ष 2006 दिसम्बर माह का सूचकांक 112.4 एवं वर्ष 2012 दिसम्बर का सूचकांक 135.3 था। उपरोक्त मदों में प्रतिशत वृद्धि 20.37 प्रतिशत का हुआ है। M-67 के दरों में बढ़ोत्तरी RBI द्वारा निर्गत Roller Bearing के Price Indexing के आधार पर किया गया है। M-86 के दरों में बढ़ोत्तरी RBI द्वारा निर्गत Copper के Price Indexing के आधार पर किया गया है। वर्ष 2006 दिसम्बर का सूचकांक-161.78 एवं वर्ष 2012 दिसम्बर का सूचकांक 178.65 है। अतः 10.42 प्रतिशत की वृद्धि हुयी है। शेष मदों के दरों में बढ़ोत्तरी के दरों में बढ़ोत्तरी RBI द्वारा निर्गत ALL COMMODITIES के Price Indexing के आधार पर किया गया है। जिन मदों की बढ़ोत्तरी 2006 से नहीं हुयी है उनकी बढ़ोत्तरी वर्ष 2006 दिसम्बर (सूचकांक 112.2) से वर्ष 2012 दिसम्बर (168.6) के सूचकांक में बढ़ोत्तरी के आधार पर सूचकांक में 50.26 प्रतिशत की वृद्धि हुयी है। जिन मदों की बढ़ोत्तरी वर्ष 2009 से नहीं हुयी थी उन मदों में बढ़ोत्तरी वर्ष 2009 जनवरी का सूचकांक 124.4 एवं दिसम्बर 2012 का सूचकांक 168.6 के आधार पर की गयी है। यह प्रतिशतता वृद्धि 35.53 है। जिन मदों की बढ़ोत्तरी वर्ष 2010 से नहीं हुयी थी उन मदों में बढ़ोत्तरी वर्ष 2010 जनवरी का सूचकांक 135.2 एवं दिसम्बर 2012 का सूचकांक 168.6 के प्रतिशतता वृद्धि के आधार पर की गयी है। यह प्रतिशतता वृद्धि 24.70 है। प्रबंध निदेशक, बिहार राज्य पुल निर्माण निगम, द्वारा लिखित रूप से Elastomeric bearing/Pad का दर 0.58Rs. per cc सूचित किया गया है, जिसे Input के लिये M-066 के अनुसार अनुमोदित किया जाता है।

**10.2 पथ निर्माण की आवश्यकता को देखते हुए उन महत्वपूर्ण मदों जिनका उपयोग यातायात सुरक्षा के लिए आवश्यक है, उनको इस वर्ष के अनुसूचित दर पुस्तिका वर्ष 2013 में शामिल किया गया है :-**

(A) **Stone-kerb:-** इसके लिए कार्यपालक अभियंता,राष्ट्रीय उच्च पथ प्रमंडल,पटना पूर्वी द्वारा दर विश्लेषण कर समर्पित किया गया था, जो संतोषजनक नहीं होने के कारण उनसे Clarification मांगी गयी थी, जो उनके द्वारा समर्पित किया गया। उसके आधार पर एवं ग्रामीण कार्य विभाग के अनुसूचित दर वर्ष 2007 की कंडिका 6.6-1500 के आधार पर दिये गये मापदंड के अनुसार वर्तमान दर पर इसका दर विश्लेषण किया गया जिसके आधार पर 375.0 mm x 300.0mm x 150.0mm का M30 ग्रेड का दर विश्लेषित हुआ जिसकी कीमत रु0- 298.31 प्रति अदद (VATछोड़कर) आता है, को अनुमोदित किया गया जिसे SOR के Material input M-199 पर शामिल किया गया।

(B) **Cat's Eye:-** इसके लिए अनुसूचित दर निर्धारण समिति द्वारा Road furniture का दर प्रति हेतु समाचार पत्रों, E-mail एवं IRC कोयम्बटूर में इसका दर विभिन्न कम्पनियों से प्राप्त किया गया। इसका Specification IRC के Specification के आधार पर रखते हुए तैयार किया गया जिसका न्यूनतम दर रु0-165.00 प्रति अदद आता है, जिसे अनुसूचित दर पुस्तिका वर्ष 2013 के मद संख्या M-062 में शामिल करने एवं Analysis के आधार पर Supply, fitting & fixing के साथ रु0 224.00 प्रति अदद आता है इसे अनुसूचित दर पुस्तिका में क्रम सं0-8.35 में दर्ज करने का निर्णय लिया गया।

(C) **Paver-Block:-** दिनांक:-17.09.12 के राज्य स्तरीय अनुसूचित दर निर्धारण समिति की बैठक में Interlocking Paver block M 35(60mm thick) for light vechile, एवं M 40 (80mm thick) for medium vechile का दर निर्धारण किया गया है जिसे अनुसूचित दर पुस्तिका के M-198 में उल्लेख किया गया है।

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

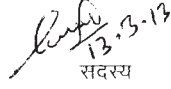
पिछले वर्ष की भाँति इस वर्ष भी नये अनुसूचित दर पुस्त का प्रकाशन किया जाना है, जिस पर सदस्यों द्वारा विचार विमर्श किया गया तथा इसे दिनांक-01.04.2013 से लागू किये जाने का सर्वसम्मति से निर्णय लिया गया।

राज्य स्तरीय अनुसूचित दर निर्धारण समिति द्वारा अनुसूचित दर पुस्त को दिनांक-01.04.2013 से प्रकाशित करने का निर्णय लिया जाता है।



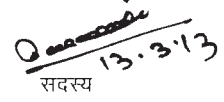
सदस्य

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



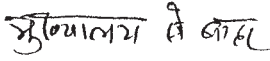
सदस्य

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



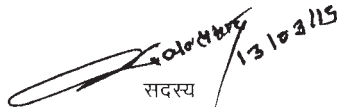
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-परियोजना संयोजक,  
नल कूप प्रभाग, लघु जल संसाधन,  
बिहार, पटना



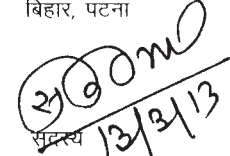
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-मुख्य अभियंता (असै0)  
बिहार राज्य बिजली बोर्ड, बिहार, पटना



सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-मुख्य अभियंता  
ऊर्जा 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-मुख्य अभियंता,  
ग्रामीण कार्य विभाग, बिहार, पटना



संयोजक

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

## SCHEDULE - I

### 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. 1416 /15.05.04	Lab. Deptt. Noti. No. 3354 /12.08.10	Lab. Deptt. Noti. No. 2787 /28.09.10	Lab. Deptt. Noti. No. 562 /21.03.12	Lab. Deptt. Noti. No. 531 /05.010.12
1	2	3	4	5	6(1.0517 x col.7)	7(1.0331 x col.6)
1	Unskilled labour	68.00	119.00	144.00	151.00	157.00
2	Sweeper	68.00	119.00	144.00	151.00	157.00
3	Mistry	68.00	119.00	144.00	151.00	157.00
4	Cleaner	68.00	119.00	144.00	151.00	157.00
5	Helper	68.00	119.00	144.00	151.00	157.00
6	Khalsi/Chainman	68.00	119.00	144.00	151.00	157.00
7	Marker	87.00	152.00	184.00	194.00	200.00
8	Fitter grade-I	94.00	164.00	199.00	209.00	216.00
	Fitter grade-II	82.00	144.00	175.00	184.00	190.00
9	Turner	82.00	144.00	175.00	184.00	190.00
10	Mechanic grade-I	106.00	186.00	225.00	237.00	245.00
	Mechanic grade-II	98.00	173.00	209.00	220.00	227.00
11	Electrician grade-I	88.00	153.00	185.00	195.00	201.00
	Electrician grade-II	82.00	144.00	175.00	184.00	190.00
12	Lineman/Wireman	79.00	140.00	169.00	178.00	184.00
13	Chargeman	98.00	173.00	209.00	220.00	227.00
14	Foreman	117.00	204.00	247.00	260.00	269.00
15	Welder grade-I	103.00	181.00	220.00	231.00	239.00
	Welder grade-II	88.00	153.00	185.00	195.00	201.00
16	Glazier	78.00	136.00	164.00	172.00	178.00
17	Carpenter	82.00	144.00	175.00	184.00	190.00
18	Head Carpenter	92.00	161.00	196.00	206.00	213.00
19	Checker	83.00	146.00	177.00	186.00	192.00
20	Hammerman	72.00	126.00	153.00	161.00	166.00
21	Tin smith	94.00	164.00	199.00	209.00	216.00
22	Tin plate maker	98.00	173.00	209.00	220.00	227.00
23	Black Smith	82.00	144.00	175.00	184.00	190.00
24	Head black smith	92.00	161.00	196.00	206.00	213.00
25	Tile layer	73.00	128.00	155.00	163.00	168.00
26	Thatcher	73.00	128.00	155.00	163.00	168.00
27	Plumber	88.00	153.00	185.00	195.00	201.00
28	Grader	83.00	146.00	177.00	186.00	192.00
29	Road binder	78.00	136.00	164.00	172.00	178.00
30	Mason	82.00	144.00	175.00	184.00	190.00
31	Head Mason	92.00	161.00	196.00	206.00	213.00
32	Stone layer	82.00	144.00	175.00	184.00	190.00
33	Tarman	72.00	126.00	153.00	161.00	166.00
34	Fireman	73.00	128.00	155.00	163.00	168.00
35	Grinder	82.00	144.00	175.00	184.00	190.00
36	Gas cutter	87.00	152.00	184.00	194.00	200.00
37	Rigger	83.00	146.00	177.00	186.00	192.00
38	Sarang	98.00	173.00	209.00	220.00	227.00
39	Chipper-cum-rivetter	87.00	152.00	184.00	194.00	200.00
40	Tractor operator	98.00	173.00	209.00	220.00	227.00
41	Dozer operator grade-I	117.00	204.00	247.00	260.00	269.00
	Dozer operator grade-II	103.00	181.00	220.00	231.00	239.00
42	Dumper operator	99.00	174.00	210.00	221.00	228.00
43	Vibrator Operator	77.00	135.00	163.00	171.00	177.00
44	Pump driver grade-I	88.00	153.00	185.00	195.00	201.00
	Pump driver grade-II	82.00	144.00	175.00	184.00	190.00
45	Dragline operator grade-I	117.00	204.00	247.00	260.00	269.00
	Dragline operator grade-II	103.00	181.00	220.00	231.00	239.00
46	Concrete mixer operator	88.00	153.00	185.00	195.00	201.00
	Concrete mixer operator	82.00	144.00	175.00	184.00	190.00

**SCHEDULE - I**

**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. 1416 /15.05.04	Lab. Deptt. Noti. No. 3354 /12.08.10	Lab. Deptt. Noti. No. 2787 /28.09.10	Lab. Deptt. Noti. No. 562 /21.03.12	Lab. Deptt. Noti. No. 531 /05.010.12
1	2	3	4	5	6(1.0517 x col.7)	7(1.0331 x col.6)
47	Compressor operator grade-	88.00	153.00	185.00	195.00	201.00
	Compressor operator grade-	82.00	144.00	175.00	184.00	190.00
48	Earth excavator					
	(a) For every 110 cu. ft for	68.00	119.00	144.00	151.00	157.00
	(b) For every 100 cu. ft for	68.00	119.00	144.00	151.00	157.00
	(c) For every 90 cu. ft for	68.00	119.00	144.00	151.00	157.00
49	Truck driver	98.00	173.00	209.00	220.00	227.00
50	Car/Jeep driver	87.00	152.00	184.00	194.00	200.00
51	Crane operator grade-I	117.00	204.00	247.00	260.00	269.00
	Crane operator grade-II	103.00	181.00	220.00	231.00	239.00
52	Winch operator	88.00	153.00	185.00	195.00	201.00
53	Road roller driver	119.00	208.00	252.00	265.00	274.00
54	Blaster	114.00	200.00	243.00	256.00	264.00
55	Painter grade-I	88.00	153.00	185.00	195.00	201.00
56	Polisher	73.00	128.00	155.00	163.00	168.00
57	Peon / Darvan / Choukidar	72.00	126.00	153.00	161.00	166.00
58	Clerk / Typist / Typist clerk	81.00	142.00	173.00	182.00	188.00
59	Time keeper	81.00	142.00	173.00	182.00	188.00
60	Store Assistant/Storeman	89.00	155.00	187.00	197.00	204.00
61	Store head	84.00	147.00	178.00	187.00	193.00
62	Material chaser	84.00	147.00	178.00	187.00	193.00
63	Mate and Road mate	73.00	128.00	155.00	163.00	171.00
64	Munshi	77.00	135.00	163.00	171.00	177.00
65	Work Supervisor	78.00	136.00	164.00	172.00	178.00
66	Amin	81.00	142.00	173.00	182.00	188.00
67	Surveyer	83.00	146.00	177.00	186.00	192.00
68	Supervisory diploma holder	111.00	196.00	237.00	249.00	257.00
69	Supervisory non-diploma	82.00	144.00	175.00	184.00	190.00
70	Any other category of semi-skilled workers not mentioned above	70.00	123.00	150.00	158.00	163.00
71	Any other category of skilled workers not mentioned above	81.00	151.00	183.00	192.00	198.00
72	Highly skilled labour	-	184.00	223.00	235.00	243.00

Note :- The above rates has been calculated as 1.0331% , increase in labour dept. notification no. 531 dt. 05.10.12 i.e (1.0331 \* column 6).

**रिवत**

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

**रिवत**

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

**सदस्य**  
13-3-13

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-परियोजना संयोजक नलकूप प्रभाग, लघु जल संसाधन विभाग, बिहार, पटना।

**सुखालयसिंह ठाकुर**

सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असेन)

**सदस्य**  
13/3/13

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता, उर्जा विभाग, बिहार, पटना।

**सदस्य**  
13/3/13

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

**सदस्य**  
13/3/13

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

**सदस्य**  
13-3-13

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

**संयोजक**  
13/3/13

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



**SCHEDULE - II**

*Dtd. 13.03.13*

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

Sl. No.	Category of Employees	Minimum Rates of wages per day				
		Lab. Deptt. Noti. No. 1416 /15.05.04	Lab. Deptt. Noti. No. 3354 /12.08.10	Lab. Deptt. Noti. No. 2787 /28.09.11	Lab. Deptt. Noti. No. 562/ 21.03.12	Lab. Deptt. Noti. No. 531/ 05.10.12
1	2	3	4	5	6( 1.0517 x col 5)	7(1.0331 xcol 6)
1	Unskilled labour	68.00	119.00	144.00	151.00	157.00
2	Mate	74.00	130.00	158.00	166.00	171.00
3	Head Mason	92.00	161.00	196.00	206.00	213.00
4	Mason	82.00	144.00	175.00	184.00	190.00
5	Printer Class-I	88.00	153.00	185.00	195.00	201.00
6	Printer Class-II	82.00	144.00	175.00	184.00	190.00
7	Head Carpenter	92.00	161.00	196.00	206.00	213.00
8	Carpenter	82.00	144.00	175.00	184.00	190.00
9	Head black smith	92.00	161.00	196.00	206.00	213.00
10	Black Smith	82.00	144.00	175.00	184.00	190.00
11	Glazier	73.00	128.00	155.00	163.00	168.00
12	Stone Dresser	88.00	153.00	185.00	195.00	201.00
13	Water Carrier	68.00	119.00	144.00	151.00	157.00
14	Fitter Class-I	94.00	164.00	199.00	209.00	216.00
15	Fitter Class-II	82.00	144.00	175.00	184.00	190.00
16	Helper	72.00	126.00	153.00	161.00	166.00
17	Hammer man	72.00	126.00	153.00	161.00	166.00
18	Bellowman	68.00	119.00	144.00	151.00	157.00
19	Road Roller Driver	119.00	208.00	252.00	265.00	274.00
20	Concrete Mixer Operator, Class-I	88.00	153.00	185.00	195.00	201.00
21	Concrete Mixer Operator, Class-II	82.00	144.00	175.00	184.00	190.00
22	Stone Crusher Driver, Class-I	88.00	153.00	185.00	195.00	201.00
23	Stone Crusher Driver, Class-II	82.00	144.00	175.00	184.00	190.00
24	Truck Driver	98.00	173.00	209.00	220.00	227.00
25	Compressor Operator, Class-I	88.00	153.00	185.00	195.00	201.00
26	Compressor Operator, Class-II	82.00	144.00	175.00	184.00	190.00
27	Pump Driver, Class-I	88.00	153.00	185.00	195.00	201.00
28	Pump Driver, Class-II	82.00	144.00	175.00	184.00	190.00
29	Concrete Mixer Attendant	72.00	126.00	153.00	161.00	166.00
30	Cleaner or Oilman	69.00	122.00	148.00	156.00	161.00
31	TarBoiler Man	82.00	144.00	175.00	184.00	190.00
32	Plumber	88.00	153.00	185.00	195.00	201.00
33	Thatcher	73.00	128.00	155.00	163.00	168.00
34	Khalasi / Chainman	73.00	128.00	155.00	163.00	168.00
35	Sweeper	69.00	122.00	148.00	156.00	161.00
36	Watchamn	69.00	122.00	148.00	156.00	161.00
37	Stone Breaker	69.00	122.00	148.00	156.00	161.00
38	Work Sarker	78.00	136.00	164.00	172.00	178.00
39	Time Keeper	81.00	142.00	173.00	182.00	188.00
40	Welder, Grade-I	103.00	181.00	220.00	231.00	239.00
41	Welder, Grade-I	88.00	153.00	185.00	195.00	201.00
42	Wireman/Lineman	79.00	140.00	169.00	178.00	184.00
43	Mechanic, Grade-I	106.00	186.00	225.00	237.00	245.00
44	Mechanic, Grade-II	98.00	173.00	209.00	220.00	227.00
45	Sarang	98.00	173.00	209.00	220.00	227.00
46	Drill Operator	82.00	144.00	175.00	184.00	190.00
47	Tractor Operator	98.00	173.00	209.00	220.00	227.00
48	Gauge Reader-cum-silt Observer	72.00	126.00	153.00	161.00	166.00
49	Crane Operator, Grade-I	117.00	204.00	247.00	260.00	269.00
50	Crane Operator, Grade-II	103.00	181.00	220.00	231.00	239.00
51	Dragline / Scraper / Showel Operator	117.00	204.00	247.00	260.00	269.00
52	Dragline/Scraper/Showel Operator	103.00	181.00	220.00	231.00	239.00
53	Dumper Operator	99.00	174.00	210.00	221.00	228.00
54	Foreman	117.00	204.00	247.00	260.00	269.00

**SCHEDULE - II**

**Dtd. 13.03.13**

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

Sl. No.	Category of Employees	Minimum Rates of wages per day				
		Lab. Deptt. Noti. No. 1416 /15.05.04	Lab. Deptt. Noti. No. 3354 /12.08.10	Lab. Deptt. Noti. No. 2787 /28.09.11	Lab. Deptt. Noti. No. 562/ 21.03.12	Lab. Deptt. Noti. No. 531/ 05.10.12
1	2	3	4	5	6( 1.0517 x col 5)	7(1.0331 xcol 6)
55	Junior Foreman	103.00	181.00	220.00	231.00	239.00
56	Chargeman	99.00	174.00	210.00	221.00	228.00
57	Electrician, Grade-I	88.00	153.00	185.00	195.00	201.00
58	Electrician, Grade-II	82.00	144.00	175.00	184.00	190.00
59	Electrician, Grade-III	72.00	126.00	153.00	161.00	166.00
60	Turner	82.00	144.00	175.00	184.00	190.00
61	Compounder	82.00	144.00	175.00	184.00	190.00
62	Supervisor / (Diploma holder)	111.00	196.00	237.00	249.00	257.00
63	Surveyer / Supervisor	82.00	144.00	175.00	184.00	190.00
64	Blue Printer	72.00	126.00	153.00	161.00	166.00
65	Tracer	72.00	126.00	153.00	161.00	166.00
66	Vibrator Operator	77.00	135.00	163.00	171.00	177.00
67	Clerk / Typist / Typist Clerk	81.00	142.00	173.00	182.00	188.00
68	Earth Excavator,				0.00	
	(a) For every 110 cubic feet of soft	68.00	119.00	144.00	151.00	157.00
	(b) For every 100 cubic feet of hard	68.00	119.00	144.00	151.00	157.00
	(c) For every 90 cubic feet of highly	68.00	119.00	144.00	151.00	157.00
69	Any other category of semi-skilled workers not mentioned above	72.00	126.00	153.00	161.00	164.00
70	Any other category of skilled workers not mentioned above	81.00	151.00	183.00	192.00	200.00
71	Highly skilled labour	-	184.00	223.00	235.00	243.00

Note :- The above rates has been calculated as 1.0331 % increase in labour deptt. notification no. 531 dtd. 05.10.12 i.e (1.0331 \* column 6)

रिक्त

सदस्य,

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

रिक्त

सदस्य,

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

रिक्त

सदस्य,

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-परियोजना संयोजक नलकूप प्रभाग, लघु जल संसाधन विभाग, बिहार, पटना।

मुख्यालय सचिव

सदस्य,

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असै०), बिहार राज्य बिजली बोर्ड, बिहार, पटना।

सदस्य,

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता, उर्जा विभाग, बिहार, पटना।

सदस्य, 13/3/13

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

सदस्य, 13/3/13

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

सदस्य,

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

संयोजक, 13/3/13

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

## Schedule:- M11

Approved revised rate of Bricks & related materials by State Level Schedule Rate Committee for the year 2012-13 (for Preparation of Schedule of Rate only)- Materials should conform to relevant BIS/IRC/ MORT & H Specifications.

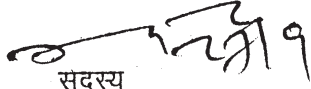
Rates are inclusive of all taxes with royalty but exclusive of VAT/ Sales Tax and overhead charges and contractor's profit

(Rates are at source)

S.N.	Material	Unit	Approved Rates (in Rs.)	
			In figure	In words
<b>1</b>	<b>100 A Bricks</b>			
	(i) For Urban Patna	Nos/1000	5636	Five thousand six hundred thirty six only
	(ii) For Darbhanga, Bhagalpur, Munger, Muzaffarpur	Nos/1000	4757	Four thousand seven hundred fifty seven only
	(iii) For Gaya, Saran	Nos/1000	4500	Four thousand five hundred only
	(iv) For Saharsa	Nos/1000	4886	Four thousand eight hundred eighty six only
	(v) For Purnea	Nos/1000	5144	Five thousand one hundred forty four only
	(vi) For Patna rural	Nos/1000	4693	Four thousand six hundred ninety three only
<b>2</b>	<b>100 B Bricks</b>			
	(i) For Urban Patna	Nos/1000	5231	Five thousand two hundred thirty one only
	(ii) For Darbhanga, Bhagalpur, Munger, Muzaffarpur	Nos/1000	4369	Four thousand three hundred sixty nine only
	(iii) For Gaya, Patna, Saran	Nos/1000	4112	Four thousand one hundred twelve only
	(iv) For Saharsa	Nos/1000	4500	Four thousand five hundred only
	(v) For Purnea	Nos/1000	4757	Four thousand seven hundred fifty seven only
	(vi) For Patna rural	Nos/1000	4289	Four thousand two hundred eighty nine only
<b>3</b>	<b>Brick Tiles(300mmx150mmx50mm)</b>			
	(i) For Urban Patna and Patna rural	Nos/1000	5636	Five thousand six hundred thirty six only
	(i) For Saharsa, Bhagalpur, Darbhanga & Muzaffarpur	Nos/1000	5661	Five thousand six hundred sixty one only
	(ii) For Purnea	Nos/1000	5920	Five thousand nine hundred twenty only
	(iii) For other places	Nos/1000	5402	Five thousand four hundred two only
<b>4</b>	<b>Picket Jhama Bricks</b>			
	(i) For Urban Patna	Nos/1000	4829	Four thousand eight hundred twenty nine only
	(ii) For Darbhanga, Bhagalpur, Munger, Muzaffarpur	Nos/1000	3983	Three thousand nine hundred eighty three only
	(iii) For Gaya, Saran	Nos/1000	3722	Three thousand seven hundred seventy two only
	(iv) For Purnea	Nos/1000	4369	Four thousand three hundred sixty nine only
	(v) For Saharsa	Nos/1000	4112	Four thousand one hundred twelve only
	(vi) Jhama bricks	Nos/1000	3088	Three thousand eighty eight only
	(vii) For Patna rural	Nos/1000	3894	Three thousand eight hundred ninety four only

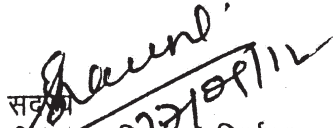
5	<b>Brick Bats</b>			
	(i) For Urban Patna	Per m <sup>3</sup>	994	Nine hundred ninty four only
	(i) For Purnea, Saharsa, Bhagalpur, Munger & Darbhanga	Per m <sup>3</sup>	954	Nine hundred fifty four only
	(ii) For other places	Per m <sup>3</sup>	913	Nine hundred thirteen only
	(vii) For Patna rural	Per m <sup>3</sup>	953	Nine hundred fifty three only
6	<b>Jhama Metals</b>			
	<b>(a) 63 mm to 40 mm size</b>			
	(i) For Urban Patna	Per m <sup>3</sup>	1181	One thousand one hundred eighty one only
	(i) For Purnea, Saharsa, Bhagalpur, Munger, Darbhanga	Per m <sup>3</sup>	1131	One thousand one hundred thirty one only
	(ii) For other places	Per m <sup>3</sup>	1108	One thousand one hundred eight only
	(vii) For Patna rural	Per m <sup>3</sup>	1154	One thousand one hundred fifty four only
	<b>(b) 40 mm to 20 mm size</b>			
	(i) For Urban Patna	Per m <sup>3</sup>	1315	One thousand three hundred fifteen only
	(i) For Purnea, Saharsa, Bhagalpur, Munger, Darbhanga	Per m <sup>3</sup>	1261	One thousand two hundred sixty one only
	(ii) For other places	Per m <sup>3</sup>	1224	One thousand two hundred twenty four only
	(vii) For Patna rural	Per m <sup>3</sup>	1275	One thousand two hundred seventy five only
	<b>(c) 20 mm and down</b>			
	(i) For Urban Patna	Per m <sup>3</sup>	1505	One thousan five hudred five only
	(i) For Purnea, Saharsa, Bhagalpur, Munger, Darbhanga	Per m <sup>3</sup>	1444	One thousand four hundred forty four only
(ii) For other places	Per m <sup>3</sup>	1392	One thousna three hundred ninety two only	
	(vii) For Patna rural	Per m <sup>3</sup>	1453	One thousan four hudred fifty three only
7	<b>Surkhi</b>			
	(i) For Urban Patna	Per m <sup>3</sup>	1559	One thousand five hundred fifty nine only
	(i) For Purnea, Saharsa, Bhagalpur, Munger, Darbhanga & Patna urban	Per m <sup>3</sup>	1495	One thousand four hundred ninety five only
	(ii) For other places	Per m <sup>3</sup>	1444	One thousand four hundred forty four only
	(vii) For Patna rural	Per m <sup>3</sup>	1505	One thousand five hundred five only

Note :- For Sr. No. 1 - 4 royalty has been included as Rs. 29 per 1000 Nos. and for Sr. No. 5 - 7 as Rs.11.6 per cum.

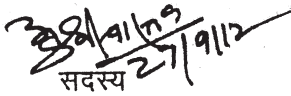


सदस्य

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



सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण  
निर्धारणसमिति-सह-मुख्य अभियंता (असे0)  
बिहार राज्य बिजली बोर्ड, बिहार, पटना



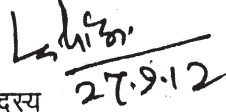
सदस्य  
राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति सह-अभियंता प्रमुख, लोक  
अभियंत्रण विभाग, बिहार, पटना

सदस्य

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

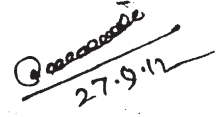
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-मुख्य अभियंता  
ऊर्जा विभाग, बिहार पटना।



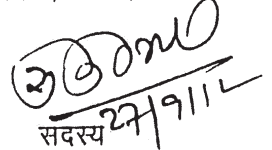
सदस्य

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



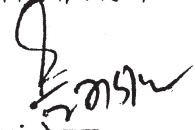
सदस्य

राज्यस्तरीय अनुसूचित दर  
समिति-सह-परियोजना संयोजक,  
नल कूप प्रभाग, लघु जल संसाधन,  
विभाग, बिहार, पटना



सदस्य

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



संयोजक

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति- सह-अभियंता प्रमुख स्वास्थ्य  
पथ निर्माण विभाग, बिहार, पटना

Date:- 13.03.13

**Schedule :- M1**

**List of Rates of Ordinary Portland Cement approved by State Level Schedule Rate Committee for the year 2013 - 14 (for Preparation of Schedule of Rate only) - Materials should conform to relevant BIS/IRC/MORT & H Specifications.**

**Rates are inclusive of Excise Duty, Cess etc. but exclusive of VAT/Sales Tax @ 13.5%, contractor's profit & overhead charge.**

Sl. No.	Name & Description of Material	Unit	Zones	Approved Rate (in Rs.)	
				in figure (Rs.)	in words
1	2	3	4	5	6
1	Ordinary Portland Cement (O.P.C - 43 Grade)	Per bag of 50 kg.	Patna	273.10	Rupees Two Hundred Seventy Three and Paise Ten Only
			Muzaffarpur	276.90	Rupees Two Hundred Seventy Six and Paise Ninety Only
			Darbhanga	279.40	Rupees Two Hundred Seventy Nine and Paise Forty Only
			Bhagalpur	278.00	Rupees Two Hundred Seventy Eight and Paise Zero Only
			Munger	270.50	Rupees Two Hundred Seventy and Paise Fifty Only
			Saharsa	279.40	Rupees Two Hundred Seventy Nine and Paise Forty Only
			Purnea	279.40	Rupees Two Hundred Seventy Nine and Paise Forty Only
			Gaya	258.40	Rupees Two Hundred Fifty Eight and Paise Forty Only
			Saran	273.10	Rupees Two Hundred Seventy Three and Paise Ten Only

**Note:- The above rate of cement is exclusive of 13.5% VAT.**

रिक्त सदस्य

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

मुठ्यालय सह सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण सह-मुख्य अभियंता (असैनिक)बिहार राज्य बिजली बोर्ड, बिहार,पटना

सदस्य

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

रिक्त सदस्य

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

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति, मुख्य अभियंता ऊर्जा विभाग, बिहार, पटना।

सदस्य

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

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति -सह-परियोजना संयोजक नल कूप प्रभाग, लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य

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

सदस्य

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

**Schedule :- M2**

**Date:- 13.03.13**

List of Rates of Ordinary Portland Cement approved by State Level Schedule Rate Committee for the year 2013- 14 (for Preparation of Schedule of Rate only) - Materials should conform to relevant BIS/IRC/MORT & H Specifications.

Rates are exclusive of Excise Duty, Cess etc, but exclusive of VAT/Sales Tax @ 13.5%, contractor's profit & overhead charge

Sl. No.	Name & Description of Material	Unit	Zones	Approved Rate (in Rs.)	
				in figure (Rs.)	in words
1	2	3	4	5	6
1	Ordinary Portland Cement (O.P.C - 33 Grade)	Per bag of 50 kg.	Patna	255.50	Rupees Two Hundred Fifty Five and Paise Fifty Only
			Muzaffarpur	259.00	Rupees Two Hundred Fifty Nine and Paise Zero Only
			Darbhanga	267.50	Rupees Two Hundred Sixty Seven and Paise Fifty Only
			Bhagalpur	267.50	Rupees Two Hundred Sixty Seven and Paise Fifty Only
			Munger	267.50	Rupees Two Hundred Sixty Seven and Paise Fifty Only
			Saharsa	276.30	Rupees Two Hundred Seventy Six and Paise Thirty Only
			Purnea	276.30	Rupees Two Hundred Seventy Six and Paise Thirty Only
			Gaya	241.70	Rupees Two Hundred Forty One and Paise Seventy Only
			Saran	259.00	Rupees Two Hundred Fifty Nine and Paise Zero Only

**Note:- The above rate of cement is exclusive of 13.5% VAT.**

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

मुल्यांकन से कएर सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असो),  
बिहार राज्य बिजली बोर्ड, बिहार, पटना।

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

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

सदस्य,  
राज्य स्तरीय अनुसूचित दर निर्धारण समिति, मुख्य अभियंता ऊर्जा विभाग,  
बिहार, पटना।

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

**Schedule :- M3A**

Date:- 13.03.13

List of Rates of Portland Pozzolana Cement received from different Companies for the approval of State Level Schedule Rate Committee for the year 2013 - 14 (for Preparation of Schedule of Rate only) - Materials should conform to relevant BIS/IRC/MORT & H Specifications.

Rates are inclusive of Excise Duty, Cess etc. but exclusive of VAT/Sales Tax @ 13.5%, contractor's profit & overhead charge.

Sl. No.	Name & Description of Material	Unit	Zones	Approved Rate (in Rs.)	
				in figure (Rs.)	in words
1	2	3	4	5	6
1	Portland Pozzolana Cement (P.P.C)	Per bag of 50 kg.	Patna	246.70	Rupees Two Hundred Forty Six and Paise Seventy Only
			Muzaffarpur	254.40	Rupees Two Hundred Fifty Four and Paise Forty Only
			Darbhanga	257.00	Rupees Two Hundred Fifty Seven and Paise Zero Only
			Bhagalpur	251.10	Rupees Two Hundred Fifty One and Paise Ten Only
			Munger	244.30	Rupees Two Hundred Forty Four and Paise Thirty Only
			Saharsa	259.00	Rupees Two Hundred Fifty Nine and Paise Zero Only
			Purnea	257.00	Rupees Two Hundred Fifty Seven and Paise Zero Only
			Gaya	216.90	Rupees Two Hundred Sixteen and Paise Ninety Only
			Saran	246.70	Rupees Two Hundred Forty Six and Paise Seventy Only

Note:- The above rate of cement is exclusive of 13.5% VAT.

*रिवत*  
सदस्य,

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

*मुख्यालय क्षेत्र*  
सदस्य,

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असे0), बिहार राज्य बिजली बोर्ड, बिहार, पटना।

*सह-अभियंता*  
सदस्य,

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

*रिवत*  
सदस्य,

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

*सदस्य*  
सदस्य,

सदस्य, राज्य स्तरीय अनुसूचित दर निर्धारण समिति, मुख्य अभियंता ऊर्जा विभाग, बिहार, पटना।

*सदस्य*  
सदस्य,

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

*सदस्य*  
सदस्य,

सदस्य, राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-परियोजना संयोजक नल कृप प्रभाग, लघु जल संसाधन विभाग, बिहार, पटना।

*सदस्य*  
सदस्य,

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

*संयोजक*  
संयोजक

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



**Schedule :- M3B**

**Date:- 13.03.13**

List of Rates of Portland Slag Cement received from different Companies for the approval of State Level Schedule Rate Committee for the year 2013 - 14 (for Preparation of Schedule of Rate only) - Materials should conform to relevant BIS/IRC/MORT & H Rates are inclusive of Excise Duty,Cess etc. but exclusive of VAT/Sales Tax @ 13.5%, contractor's profit & overhead charge

Sl. No.	Name & Description of Material	Unit	Zones	Approved Rate (in Rs.)	
				in figure (Rs.)	in words
1	2	3	4	5	6
1	Portland Slag Cement (P. S.C)	Per bag of 50 kg.	Patna	299.60	Rupees Two Hundred Ninety Nine and Paise Sixty Only
			Muzaffarpur	304.60	Rupees Three Hundred Four and Paise Sixty Only
			Darbhanga	308.30	Rupees Three Hundred Eight and Paise Thirty Only
			Bhagalpur	301.50	Rupees Three Hundred One and Paise Fifty Only
			Munger	287.80	Rupees Two Hundred Eighty Seven and Paise Eighty
			Saharsa	300.50	Rupees Three Hundred and Paise Fifty Only
			Purnea	300.50	Rupees Three Hundred and Paise Fifty Only
			Gaya	286.70	Rupees Two Hundred Eighty Six and Paise Seventy Only
			Saran	299.60	Rupees Two Hundred Ninety Nine and Paise Sixty Only

**Note:- The above rate of cement is exclusive of 13.5% VAT.**

*रिक्त*  
सदस्य

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

*सुदयानन्द*  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असै0), बिहार राज्य विद्युत बोर्ड, बिहार, पटना।

*सुदयानन्द*  
सदस्य

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

*रिक्त*  
सदस्य

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

*सुदयानन्द*  
सदस्य

राज्य स्तरीय अनुसूचित दर निर्धारण समिति, मुख्य अभियंता ऊर्जा विभाग, बिहार, पटना।

*सुदयानन्द*  
सदस्य

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

*सुदयानन्द*  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-परियोजना संयोजक नल कृप प्रमाण, लघु जल संसाधन विभाग, बिहार, पटना।

*सुदयानन्द*  
सदस्य

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

*सुदयानन्द*  
सदस्य

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

**Schedule :- M4**

Dtd. 13.03.13

**List of Rates of Different Grades of Bitumen approved by State Level Schedule Rate Committee for the year 2013 - 14 for the preparation of Schedule of Rate only. Materials should confirm to relevant BIS/IRC/MORT&H Specifications.**

**Rates are inclusive of Excise Duty etc. but exclusive of VAT/Sales Tax , Contractor's profit and Overhead charges.**

Sl. No.	Name & Description of Material	Unit	Approved Rate (in Rs.)	
			in figure(Rs.)	in words
1	2	3	4	5
1	Bitumen Grade VG-40(30/40 )Packed			
	(i ) Ex. Haldia	Per MT	49421.40	Forty nine thousand four hundred twenty one rupees forty paise.
	(ii ) Ex. Barauni	Per MT	51378.00	Fifty one thousand three hundred seventy eight rupees.
	(iv)Ex. Patna	Per MT	51466.700	Fifty one thousand four hundred sixty six rupees seventy paise.
	(v)Ex. Muzaffarpur	Per MT	51752.70	Fifty one thousand seven hundred fifty two rupees seventy paise.
	(vi) Ex. Gaya	Per MT	51240.70	Fifty one thousand two hundred forty rupees seventy paise.
2	Bitumen Grade VG-30(60/70) Packed			
	(i ) Ex. Barauni	Per MT	48460.30	Forty eight thousand four hundred sixty rupees thirty paise.
	(ii) Ex. Gaya	Per MT	48323.00	Forty eight thousand four hundred sixty rupees thirty paise.
	(iii) Ex. Haldia	Per MT	46503.70	Forty six thousand five hundred three rupees seventy paise.
	(vi) Ex. Patna	Per MT	48549.00	Forty eight thousand five hundred fourty nine rupees .
	(vii) Ex. Muzaffarpur	Per MT	48835.00	Forty eight thousand eight hundred thirty five rupees .
3	Bitumen Grade VG-10( 80/100) Packed			
	(i ) Ex. Barauni	Per MT	47544.90	Forty seven thousand five hundred forty four rupees ninty paise .
	(ii) Ex. Gaya	Per MT	47407.60	Forty seven thousand four hundred seven rupees sixty paise .
	(iii) Ex. Haldia	Per MT	45588.40	Forty five thousand five hundred eighty eight rupees forty paise .
	(vi) Ex. Patna	Per MT	47633.60	Forty seven thousand six hundred thirty three rupees sixty paise .
	(vii) Ex. Muzaffarpur	Per MT	47919.70	Forty seven thousand nine hundred nineteen rupees seventy paise .
4	Bitumen Grade 30/40 Bulk			
	(i ) Ex. Haldia	Per MT	45874.40	Forty five thousand eight hundred seventy four rupees forty paise .
5	Bitumen Grade 60/70 Bulk			
	(i ) Ex. Haldia	Per MT	42956.70	Forty two thousand nine hundred fifty six rupees seventy paise .
	(ii ) Ex. Barauni	Per MT	44135.20	Forty four thousand one hundred thirty five rupees twenty paise .
6	Bitumen Grade 80/100 Bulk			
	(i) Ex. Haldia	Per MT	42041.30	Forty two thousand forty one rupees thirty paise .
	(ii ) Ex. Barauni	Per MT	43219.90	Forty three thousand two hundred nineteen rupees ninty paise .
7	Modified Graded Bitumen			
	(i) CRMB-50 Packed Ex. Barauni	Per MT	48403.10	Forty eight thousand four hundred three rupees ten paise.
	(ii) CRMB-50 Packed Ex. Muzaffarpur	Per MT	48697.70	Forty eight thousand six hundredninty seven rupees seventy paise .
	(iii) CRMB-50 Packed Ex. Gaya	Per MT	48185.70	Forty eight thousand one hundred eighty five rupees seventy paise.
	(vi) CRMB-50 Packed Ex. Patna	Per MT	48411.70	Forty eight thousand four hundred eleven rupees seventy paise .
	(v) CRMB-50 Packed Ex. Haldia	Per MT	46366.40	Forty six thousand three hundred sixty six rupees forty paise .
	(vi) CRMB-55 Packed Ex. Barauni	Per MT	48563.30	Forty eight thousand eight hundred thirty five rupees thirty paise.
	(vii) CRMB-55 Packed Ex. Haldia	Per MT	46091.80	Forty six thousand ninty one rupees eighty paise .
	(viii) CRMB-55 Packed Ex. Gaya	Per MT	47911.80	Forty seven thousand nine hundred eleven rupees eighty paise .
	(ix) CRMB-55 Packed Ex. Patna	Per MT	48137.10	Forty eight thousand one hundred thirty seven rupees ten paise .
	(x) CRMB-55 Packed Ex. Muzaffarpur	Per MT	48423.10	Forty eight thousand four hundred twenty three rupees ten paise .
	(xi) CRMB-60 Packed Ex. Barauni	Per MT	48483.20	Forty eight thousand four hundred eighty three rupees twenty paise.
	(xii) CRMB-60 Packed Ex. Haldia	Per MT	46355.00	Forty six thousand three hundred fifty five rupees .
	(xiii) CRMB-60 Packed Ex. Patna	Per MT	48400.20	Forty eight thousand four hundred rupees twenty paise .
	(xiv) CRMB-60 Packed Ex. Muzaffarpur	Per MT	48686.30	Forty eight thousand six hundred eighty six rupees thirty paise.
	(xv) CRMB-60 Packed Ex. Gaya	Per MT	48174.30	Forty eight thousand one hundred seventy four rupees thirty paise.
	(xvi) CRMB-50 Bulk Ex. Haldia	Per MT	42533.40	Forty two thousand five hundred thirty three rupees forty paise.
	(xvii) CRMB-55 Bulk Ex. Haldia	Per MT	42258.70	Forty two thousand two hundred fifty eight rupees seventy paise.
	(xviii) CRMB-60 Bulk Ex. Haldia	Per MT	42521.90	Forty two thousand five hundred twenty one rupees ninty paise.

Sl. No.	Name & Description of Material	Unit	Approved Rate (in Rs.)	
			in figure(Rs.)	in words
	Emulsion (HINCOL)			
	(i) RS1 Ex.- Rukunpura (HINCOL)	Per MT	41351.00	Fourty one thousand three hundred fifty one rupees.
	(ii) MS Ex.- Rukunpura (HINCOL)	Per MT	43116.00	Fourty three thousand one hundred sixteen rupees.
	(iii) SS Ex.- Rukunpura (HINCOL)	Per MT	44097.00	Fourty four thousand ninty seven rupees.

Note:- (i) The above rates are 5 % Vats on Bitumen and 13.5 % For CRMB products and will be charged extra for Indian oil.

(ii) The above rates are 5 % Vats on Bitumen and 13.5 % for CRMB 55 and will be charged extra for Fathua, Rukunpura, Gaya, & Muzaffarpur for HPCL.

(iii) For Emulsion 5% Vat will be charged extra.

रिक्टर  
सदस्य,

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

अनुसूचित दर निर्धारण  
सदस्य,

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-मुख्य अभियंता (असै0),  
बिहार राज्य विद्युत बोर्ड, बिहार, पटना।

अभियंता  
सदस्य,

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

रिक्टर  
सदस्य,

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

सदस्य,

राज्य स्तरीय अनुसूचित दर निर्धारण  
समिति -सह- मुख्य अभियंता ऊर्जा विभाग,  
बिहार पटना।

सदस्य,

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

सदस्य,  
13.3.13

राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-परियोजना संयोजक नल कूप प्रभाग,  
लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य,  
13.3.13

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

संयोजक,

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

**Schedule :- M5** Dtd. 13.03.13

**Approved new rate of G.C. Sheet by State Level Schedule Rate Committee for the year 2013 - 14 (for Preparation of Schedule of Rate only) - Materials should conform to relevant BIS/IRC/MORT & H Specifications.**

**Rates are inclusive of Excise Duty, Cess etc. but exclusive of VAT/Sales Tax, Contractor's profit and Overhead charges.**

Sl. No.	Name & Description of Materials	Unit	Approved Rates (in Rs.)	
			in figure (Rs.)	in words
1	2	3	4	5
	<b>G. C. Sheet in mm</b>			
1	0.63	Per MT.	53500.00	Rupees Fifty Three Thousand Five Hundred and Paise Zero Only
2	0.50	Per MT.	55200.00	Rupees Fifty Five Thousand Two Hundred and Paise Zero Only
3	0.40	Per MT.	69257.00	Rupees Sixty Nine Thousand Two Hundred Fifty Seven and Paise Zero Only
4	0.35	Per MT.	70873.00	Rupees Seventy Thousand Eight Hundred Seventy Three and Paise Zero Only

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

**सुरेशचन्द्र लाल ठाकुर**  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असेट),  
बिहार राज्य बिजली बोर्ड, बिहार, पटना।

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

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

**सुरेशचन्द्र लाल ठाकुर**  
सदस्य,  
राज्य स्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता ऊर्जा विभाग,  
बिहार, पटना।

**सुरेशचन्द्र लाल ठाकुर**  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
जल संसाधन विभाग, बिहार, पटना।

**सुरेशचन्द्र लाल ठाकुर**  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-परियोजना संयोजक मूल कूप प्रभाग,  
लघु जल संसाधन विभाग, बिहार, पटना।

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

**सुरेशचन्द्र लाल ठाकुर**  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
पथ निर्माण विभाग, बिहार, पटना।

**Schedule :- M6**

Dtd. 13.03.13

**Approved new rate of Steel - Wire Rod in Coil by State Level Schedule Rate Committee for the year 2013 - 14 (for Preparation of Schedule of Rate only) - Materials should conform to relevant BIS/IRC/IMORT & H Specifications.**

**Rates are inclusive of Excise Duty, Cess etc. but exclusive of VAT/Sales Tax, Contractor's profit and Overhead charges.**

Sl. No.	Name & Description of Materials	Unit	Approved Rates (in Rs.)	
			in figure (Rs.)	in words
1	2	3	4	5
	<b>Wire Rod in Coil</b>			
1	5.5 mm	Per MT.	44200.00	Rupees Forty Four Thousand Two Hundred and Paise Zero Only
2	6.0 mm	Per MT.	44050.00	Rupees Forty Four Thousand Fifty and Paise Zero Only
3	6.5 mm	Per MT.	43900.00	Rupees Forty Three Thousand Nine Hundred and Paise Zero Only
4	7.0 mm	Per MT.	43700.00	Rupees Forty Three Thousand Seven Hundred and Paise Zero Only
5	8.0 mm	Per MT.	43550.00	Rupees Forty Three Thousand Five Hundred Fifty and Paise Zero Only
6	10.0 mm	Per MT.	44200.00	Rupees Forty Four Thousand Two Hundred and Paise Zero Only
7	12.0/12.7 mm	Per MT.	44200.00	Rupees Forty Four Thousand Two Hundred and Paise Zero Only

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

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

**रिक्त**  
सरस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-परियोजना संयोजक नल कूप प्रसाद, लघु जल संसाधन विभाग, बिहार, पटना।

**सुखपालय सं लोहर**  
सरस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असैठ), बिहार राज्य बिजली बोर्ड, बिहार, पटना।

**सुखपालय सं लोहर**  
सरस्य,  
राज्य स्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता ऊर्जा विभाग, बिहार, पटना।

**सुखपालय सं लोहर**  
सरस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग, निगरानी विभाग, बिहार, पटना।

**सुखपालय सं लोहर**  
सरस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, लोक स्वास्थ्य अभियंत्रण विभाग, बिहार, पटना।

**सुखपालय सं लोहर**  
सरस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, जल संसाधन विभाग, बिहार, पटना।

**सुखपालय सं लोहर**  
सरस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, पथ निर्माण विभाग, बिहार, पटना।

**Schedule :- M8**

Dtd. 13.03.13

**Approved new rate of Steel Channel by State Level Schedule Rate Committee for the year 2013 - 14 (for Preparation of Schedule of Rate only) - Materials should conform to relevant BIS/IRC/MORT & H Specifications.**

**Rates are inclusive of Excise Duty, Cess etc. but exclusive of VAT/Sales Tax, Contractor's profit and Overhead charges.**

Sl. No.	Name & Description of Materials	Unit	Approved Rates (in Rs.)	
			in figure (Rs.)	in words
1	2	3	4	5
	<b>STEEL CHANNEL</b>			
1	Channel 75 x 40	Per MT.	-	
2	Channel 100 x 50	Per MT.	45800.00	
3	Channel 125 x 65	Per MT.	45350.00	Rupees Forty Five Thousand Eight Hundred and Paise Zero Only
4	Channel 150 x 75	Per MT.	45550.00	Rupees Forty Five Thousand Three Hundred Fifty and Paise Zero Only
5	Channel 175 x 75	Per MT.	-	Rupees Forty Five Thousand Five Hundred Fifty and Paise Zero Only
6	Channel 200 x 75	Per MT.	-	
7	Channel 250 x 82	Per MT.	-	
8	Channel 300 x 90	Per MT.	-	
9	Channel 400 x 100	Per MT.	-	

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

**सुब्बालय सेठक**  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असो), बिहार राज्य विजली बोर्ड, बिहार, पटना।

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

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

**सुब्बालय सेठक**  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता ऊर्जा विभाग, बिहार, पटना।

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

**सुब्बालय सेठक**  
सदस्य,  
13.3.13

राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-परियोजना संचालक नल कूप प्रमाण, लघु जल संसाधन विभाग, बिहार, पटना।

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

**सुब्बालय सेठक**  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, पथ निर्माण विभाग, बिहार, पटना।

**Schedule :- M9**

Dtd. 13.03.13

**Approved new rate of Steel Angles by State Level Schedule Rate Committee for the year 2013 - 14 (for Preparation of Schedule of Rate only) - Materials should conform to relevant BIS/IRC/MORT & H Specifications.**

Rates are inclusive of Excise Duty,Cess etc. but exclusive of VAT/Sales Tax, Contractor's profit and Overhead charges.

Sl. No.	Name & Description of Materials	Unit	Approved Rates (in Rs.)	
			in figure (Rs.)	in words
1	2	3	4	5
	<b>STEEL ANGLES</b>			
1	50 x 50 x 6	Per MT.		
2	60 x 60 x 6	Per MT.		
3	65 x 65 x 6	Per MT.		
4	75 x 75 x 6	Per MT.	45100.00	Rupees Forty Five Thousand One Hundred and Paise Zero Only
5	80 x 80 x 8 /10/12	Per MT.	45100.00	Rupees Forty Five Thousand One Hundred and Paise Zero Only
6	90 x 90 x 6/8	Per MT.	45100.00	Rupees Forty Five Thousand One Hundred and Paise Zero Only
7	100 x 100 x 8/10/12	Per MT.	45100.00	Rupees Forty Five Thousand One Hundred and Paise Zero Only
8	110 x 110 x 8/10/12	Per MT.	45100.00	Rupees Forty Five Thousand One Hundred and Paise Zero Only
9	130 x 130 x 10/12	Per MT.	45100.00	Rupees Forty Five Thousand One Hundred and Paise Zero Only
10	150 x 150 x 12/16/20	Per MT.	45100.00	Rupees Forty Five Thousand One Hundred and Paise Zero Only
11	200 x 200 x 16/18/20	Per MT.	45100.00	Rupees Forty Five Thousand One Hundred and Paise Zero Only

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

**शुभ्रात्मय से बाहर**  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असैड), बिहार राज्य बिजली बोर्ड, बिहार, पटना।

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

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

**सदस्य,**  
राज्य स्तरीय अनुसूचित दर निर्धारण समिति -सह-मुख्य अभियंता ऊर्जा विभाग, बिहार, पटना।

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

**सदस्य,**  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-परियोजना संयोजक नल कृष्ण प्रसाद, लघु जल संसाधन विभाग, बिहार, पटना।

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

**संयोजक,**  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख, पथ निर्माण विभाग, बिहार, पटना।

**Schedule :- M10A**

Dtd. 13.03.13

**Approved new rate of Steel - TMT BARS (Fe500) State Level Schedule Rate Committee for the year 2013 - 14 (for Preparation of Schedule of Rate only) - Materials should conform to relevant BIS/IRC/MORT & H Specifications.**

**Rates are inclusive of Excise Duty, Cess etc. but exclusive of VAT/Sales Tax, Contractor's profit and Overhead charges .**

Sl. No.	Name & Description of Materials	Unit	Approved Rates (in Rs.)	
			in figure (Rs.)	in words
1	2	3	4	5
	<b>STEEL TMT BARS</b>			
1	TMT Fe - 500 - 8 mm	Per MT.	44500.00	Rupees Forty Thousand Five Hundred and Paise Zero Only
2	TMT Fe - 500 - 10 mm	Per MT.	43000.00	Rupees Forty Three Thousand and Paise Zero Only
3	TMT Fe - 500 - 12 mm	Per MT.	42500.00	Rupees Forty Two Thousand Five Hundred and Paise Zero Only
4	TMT Fe - 500 - 16 mm	Per MT.	42500.00	Rupees Forty Two Thousand Five Hundred and Paise Zero Only
5	TMT Fe - 500 - 20 mm	Per MT.	42500.00	Rupees Forty Two Thousand Five Hundred and Paise Zero Only
6	TMT Fe - 500 - 25 mm	Per MT.	42500.00	Rupees Forty Two Thousand Five Hundred and Paise Zero Only
7	TMT Fe - 500 - 28 mm	Per MT.	42500.00	Rupees Forty Two Thousand Five Hundred and Paise Zero Only
8	TMT Fe - 500 - 32 mm	Per MT.	42500.00	Rupees Forty Two Thousand Five Hundred and Paise Zero Only

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

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

**रिक्त**  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-परियोजना संयोजक नल कृष्ण प्रमाण, लघु जल संसाधन विभाग, बिहार, पटना।

**सुदधान्या से बाहर**  
सदस्य,  
राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता (असि) , बिहार राज्य बिजली बोर्ड , बिहार, पटना।

**रिक्त**  
सदस्य,  
राज्य स्तरीय अनुसूचित दर निर्धारण समिति -सह-मुख्य अभियंता ऊर्जा विभाग, बिहार, पटना।

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

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

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

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



## Schedule - M / MORTH - 1

Dt:- 13.03.2013

List of Approved Rates of Stone Materials for the Preparation of Schedule of rates only, by State level schedule rate committee (Materials Should conform to relevant B.I.S, MORD and MORT&H Specifications). The rates are inclusive of excise duty, royalty and cess but exclusive of VAT and Contractors profit. "Rates are at source"

Sl. No.	Description of materials	Unit	Approved Rates (in Rs.)	Remarks
M-001	Stone Boulder of size 150 mm and below at Crusher Plant	cum	294.26	Including Royalty @ Rs. 100.0 per Cum
M-002	Supply of quarried stone 150 - 200 mm size for Hand Broken at site	cum	294.26	"
M-003	Boulder with minimum size of 300 mm for Pitching at Site	cum	294.26	"
M-004	Coarse sand i) Quarry Koilwar/Sone sand	cum	133.28	Including Royalty @ Rs. 50.0 per Cum
M-005	Coarse sand ii) at doriganj Equivalent to Koilwar/ Sone sand	cum	133.28	"
M-006	Fine sand at Site	cum	113.71	"
M-007	Moorum at Site	cum	127.69	Including Royalty @ Rs. 55.0 per Cum
M-008	Gravel/Quarry spall at Site	Cum	294.26	Including Royalty @ Rs. 100.0 per Cum
M-009	Granular Material or hard murrum for GSB works at Site	Cum	127.69	Including Royalty @ Rs. 50.0 per Cum
M-010	Granular Material or hard murrum for GSB works at Mixing Plant	Cum	127.69	"
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	391.93	
M-013	Close graded Granular sub-base Material 53 mm to 9.5 mm	cum	494.46	
M-014	Close graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	471.86	
M-015	Close graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	529.62	"
M-016	Close graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	508.74	"
M-017	Close graded Granular sub-base Material 9.5 mm to 2.36 mm	cum	394.31	"
M-018	Close graded Granular sub-base Material 4.75mm to 2.36 mm	cum	195.72	"
M-019	Close graded Granular sub-base Material 4.75mm to 75 micron mm	cum	181.88	"
M-020	Close graded Granular sub-base Material 2.36 mm	cum	181.88	"
M-021	Stone crusher dust finer than 3mm with not more than 10% passing 0.075 sieve.	cum	92.57	Including Royalty @ Rs. 10.0% of price
M-022	Coarse graded Granular sub-base Material 2.36 mm & below	cum	181.88	Including Royalty @ Rs. 100.0 per Cum
M-023	Coarse graded Granular sub-base Material 4.75mm to 75 micron mm		181.88	"
M-024	Coarse graded Granular sub-base Material 4.75 mm to 2.36 mm	cum	195.72	"
M-025	Coarse graded Granular sub-base Material 9.5 mm to 4.75 mm	cum	508.74	"
M-026	Coarse graded Granular sub-base Material 26.5 mm to 4.75 mm	cum	480.94	"
M-027	Coarse graded Granular sub-base Material 26.5 mm to 9.5 mm	cum	529.62	"
M-028	Coarse graded Granular sub-base Material 37.5 mm to 9.5 mm	cum	471.86	"

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RCD/SOR\_8th edition\_April 2013

## Schedule - M / MORTH - 1

Dt:- 13.03.2013

List of Approved Rates of Stone Materials for the Preparation of Schedule of rates only, by State level schedule rate committee (Materials Should conform to relevant B.I.S, MORD and MORT&H Specifications). The rates are inclusive of excise duty, royalty and cess but exclusive of VAT and Contractors profit. "Rates are at source"

Sl. No.	Description of materials	Unit	Approved Rates (in Rs.)	Remarks
M-029	Coarse graded Granular sub-base Material 53 mm to 26.5mm	cum	441.36	Including Royalty @ Rs. 100.0 per Cum
M-030	Aggregates below 5.6 mm	cum	195.72	
M-031	Aggregates 22.4 mm to 2.36 mm	cum	507.98	"
M-032	Aggregates 22.4 mm to 5.6 mm	cum	507.98	"
M-033	Aggregates 45 mm to 2.8 mm	cum	453.47	"
M-034	Aggregates 45 mm to 22.4 mm	cum	461.26	"
M-035	Aggregates 53 mm to 2.8 mm	cum	453.47	"
M-036	Aggregates 53 mm to 22.4 mm	cum	441.36	"
M-037	Aggregates 63 mm to 2.8 mm	cum	412.37	"
M-038	Aggregates 63 mm to 45 mm	cum	412.26	"
M-039	Aggregates 90 mm to 45 mm	cum	382.30	"
M-040	Aggregates 10 mm to 5 mm	cum	508.74	"
M-041	Aggregates 11.2 mm to 0.09 mm	cum	333.95	"
M-042	Aggregates 13.2 mm to 0.09 mm	cum	452.61	"
M-043	Aggregates 13.2 mm to 5.6 mm	cum	589.97	"
M-044	Aggregates 13.2 mm to 10 mm	cum	617.12	"
M-045	Aggregates 20 mm to 10 mm	cum	617.12	"
M-046	Aggregates 25 mm to 10 mm	cum	588.46	"
M-047	Aggregates 19 mm to 6 mm	cum	507.98	"
M-048	Aggregates 37.5 mm to 19 mm	cum	461.26	"
M-049	Aggregates 37.5 mm to 25 mm	cum	461.26	"
M-050	Aggregates 6 mm nominal size	cum	394.20	"
M-051	Aggregates 10 mm nominal size	cum	589.97	"
M-052	Aggregates 13.2/12.5 mm nominal size	cum	617.12	"
M-053	Aggregates 20 mm nominal size	cum	529.62	"
M-054	Aggregates 25 mm nominal size	cum	505.28	"
M-055	Aggregates 40 mm nominal size	cum	425.02	"

*द्वारा*

सदस्य

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

*द्वारा*  
13.3.13  
सदस्य

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

*द्वारा*  
13.3.13  
सदस्य

राज्यस्तरीय अनुसूचित दर  
समिति-सह-परियोजना संयोजक,  
नल कूप प्रभाग, लघु जल संसाधन,  
विभाग, बिहार, पटना

*द्वारा*  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
निर्धारणसमिति-सह-मुख्य अभियंता (असै0)  
बिहार राज्य बिजली बोर्ड, बिहार, पटना

*द्वारा*  
13.02.13  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-मुख्य अभियंता  
ऊर्जा विभाग, बिहार पटना।

*द्वारा*  
13.3.13  
सदस्य

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

*द्वारा*  
13/3/13  
सदस्य

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

*द्वारा*  
सदस्य

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

*द्वारा*  
12.03/13  
संयोजक

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति- सह-अभियंता प्रमुख स्वास्थ्य  
पथ निर्माण विभाग, बिहार, पटना

<b>Schedule - M / MORTH - 1A</b>			
<b>List of Approved rates of construction Materials for the Preparation of Schedule of rate only, by state level schedule rate committee (Materials Should confirm to relevant B.I.S , MORD and MORT&amp;H Specification).The rates are inclusive of excise duty ,royalty and cess but exclusive of VAT and</b>			
<b>Sl. No.</b>	<b>Description</b>	<b>Unit</b>	<b>RATE</b>
M-056	AC pipe 100 mm dia	metre	44.72
M-057	Acrylic polymer bonding coat	litre	input
M-058	Alluminium Paint	litre	117.65
M-059	Aluminium alloy plate 2mm Thick	sqm	9000.00
M-060	Aluminium alloy/galvanised steel.	tonne	36000.00
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	8400.00
M-062	Roas studs with micro prismatic lense reflectors (with shank)	each	165.00
M-063	Barbed wire	kg	52.94
M-064	Bearing (Cost of parts)	nos	input
M-065	Bearing (Cast steel rocker bearing assembly of 250 tonne )	nos	74250.00
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	0.58
M-067	Bearing (Forged steel roller bearing of 250 tonne).	nos	44550.00
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	input
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	30000.00
M-071	Bentonite	kg	3.171
M-072	Binding wire .	kg	53.85
M-073	Bitumen ( Cationic Emulsion ) Packed Ex- Ulberia (M.S)	tonne	43116.00
M-074	Bitumen (60-70 grade) Packed Ex- Barauni	tonne	48460.30
M-075	Bitumen (80-100 grade ) Packed Ex- Barauni	tonne	47544.90
M-076	Bitumen (Cutback ) Packed Ex- Barauni	tonne	48460.30
M-077	Bitumen (emulsion) Packed Ex- Haldia (M.S)	tonne	43116.00
M-078	Bitumen (modified graded) Packed Ex - Barauni (CRMB - 55)	tonne	48563.30
M-079	Brick 100A for Patna Urban Darbhanga, Bhagalpur, Munger, Muzaffarpur Gaya, Patna, Saran Saharsa Purnea	each each each each each	5.64
M-080	C.I. shoes for the pile	kg	47.06
M-081	Cement - OPC 43 Grade at Patna	tonne	5462.00
M-082	Cold twisted bars (HYSD Bars) - Fe 500	tonne	42812.50
M-083	Coller for joints 300 mm dia	nos	0.00
M-084	Compressible Fibre Board(20mm thick)	sqm	801.00
M-085	Connectors/ Staples	each	input
M-086	Copper Plate(12m long x 250mmwide)(COPPER-WPI-10.42%)	kg	690.13
M-087	Corrosion resistant Structural steel.	tonne	43326.51
M-088	Corrugated sheet, 3 mm thick, "Thrie" beam section railing .	kg	48.63
M-089	Credit for excavated rock found suitable for use	cum	135.00
M-090	Curing compound	litre	120.00
M-091	Delineators from ISI certified firm as per the standard drawing given in IRC - 79	each	774.40
M-092	Earth Cost or compensation for earth taken from private land	cum	23.65

Sl. No.	Description	Unit	RATE
M-093	Elastomeric slab seal expansion joint assembly manufactured by using chloroprene, elastomer for elastomeric slab unit conforming to	metre	25725.00
M-094	Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	100 nos	600.00
M-095	Epoxy compound with accessories for preparing epoxy mortar	kg	525.00
M-096	Epoxy mortar	kg	720.00
M-097	Epoxy primer	kg	12.00
M-098	Epoxy resin-hardner mix for prime coat	kg	637.50
M-099	Flag of red color cloth 600 x 600 mm	each	45.00
M-100	Flowering Plants	each	30.00
M-101	Galvanised MS flat clamp.	nos	14.87
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	93.91
M-103	Galvanised structural steel plate 200 mm wide, 6 mm thick, 24 m long .	kg	43.29
M-104	Gelatin 80%	kg	643.63
M-105	Geo grids	sqm	input
M-106	Geomembrane	sqm	input
M-107	Geonets	sqm	103.13
M-108	Geotextile	sqm	80.63
M-109	Geotextile filter fabric	sqm	80.63
M-110	GI bolt 10 mm Dia	nos	15.00
M-111	Grouting pump with agitator	hour	150.00
M-112	Grass (Doob)	kg	3.89
M-113	Grass (Fine)	kg	3.89
M-114	HDPE pipes 75mm dia	metre	202.50
M-115	HDPE pipes 90mm dia	metre	202.50
M-116	Hedge plants	each	30.00
M-117	Helical pipes 600mm diameter	metre	input
M-118	Hot applied thermoplastic compound (Sp. Gravity - 2.10)	litre	195.17
M-119	HTS strand .	tonne	66566.75
M-120	Joint Sealant Compound	kg	24.00
M-121	Jute netting, open weave, 2.5 cm square opening for seeding and Mulching	sqm	37.50
M-122	LDO for steam curing	litre	input
M-123	M.S. Clamps.	nos	32.07
M-124	M.S. Clamps .	kg	58.05
M-125	M.S.shoes @ 35 Kg per pile of 15 m .	kg	22.20
M-126	Mild Steel bars	tonne	43971.42
M-127	Modular strip/box seal expansion joint including anchorage catering to a horizontal movement beyond 70 mm and upto 140mm assembly	metre	28350.00

Sl. No.	Description	Unit	RATE
M-128	Modular strip/box seal expansion joint catering to a horizontal movement beyond 140mm and upto 210mm box/box seal joint	metre	input
M-129	Nipples 12mm	nos	input
M-130	Nuts and bolts	kg	58.03
M-131	Paint	litre	217.80
M-132	Pavement Marking Paint	litre	217.80
M-133	Paving Fabric	sqm	input
M-134	Perforated geosynthetic pipe 150 mm dia	metre	input
M-135	Perforated pipe of cement concrete, internal dia 100 mm	metre	108.00
M-136	Pesticide	kg	68.40
M-137	Pipes 200 mm dia, 2.5 m long for drainage	metre	165.00
M-138	Plastic sheath, 1.25 mm thick for dowel bars	sqm	15.00
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	937.50
M-142	Pre-coated stone chips of 13.2 mm nominal size	cum	617.12
M-143	Preformed continuous chloroprene elastomer or closed cell foam sealing element with high tear strength, vulcanised in a single	metre	input
M-144	Pre-moulded asphalt filler board	sqm	937.50
M-145	Pre-packed cement based polymer concrete of strength 45 Mpa at 28 days	kg	input
M-146	Primer	kg	12.00
M-147	Quick setting compound	kg	input
M-148	Random Rubble Stone	cum	294.26
M-149	RCC Pipe NP 4 heavy duty non presure pipe 1000 mm dia	metre	2811.63
M-150	RCC Pipe NP 4 heavy duty non presure pipe 1200 mm dia	metre	3997.25
M-151	RCC Pipe NP 4 heavy duty non presure pipe 300 mm dia	metre	514.90
M-152	Reflectorising glass beads	kg	63.43
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	7.50
M-159	Sand bags ( Empty cement bag)	nos	6.73
M-160	Sapling 2 m high 25 mm dia	each	22.50
M-161	Scrap tyres of size 900 x 20	nos	75.00
M-162	Seeds	kg	30.00
M-163	Selected earth (Including royalty @ Rs. 15.0 per cum & compensation @ Rs. 1.10 per cum)	cum	23.65
M-164	Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	15.00
M-165	Sheathing duct	metre	82.50
M-166	Shrubs	each	15.00
M-167	Sludge / Farm yard manure @ 0.18 cum per 100 sqm at site of work	cum	675.00
M-168	Sodium vapour lamp	each	input
M-169	Square Rubble Coursed Stone	cum	294.26

Sl. No.	Description	Unit	RATE
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	120.00
M-173	Steel helmet and cushion block on top of pile head during driving.	kg	39.52
M-174	Steel pipe 25 mm external dia as per IS:1239	metre	123.54
M-175	Steel pipe 50 mm external dia as per IS:1239	metre	221.11
M-176	Steel wire rope 20 mm	kg	38.29
M-177	Steel wire rope 40 mm	kg	38.29
M-178	Strip seal expansion joint	metre	7980.95
M-179	Structural Steel	tonne	44879.36
M-180	Super plastisizer admixture IS marked as per 9103-1999	tonne	150.00
M-181	Synthetic Geogrids as per clause 3102.8 and approved design and specifications.	sqm	input
M-182	Through and bond stone	each	11.25
M-183	Tie rods 20mm diameter	nos	input
M-184	Tiles size 300 x 300 mm and 25 mm thick	each	37.50
M-185	Timber	cum	41550.00
M-186	Traffic cones with 150 mm reflective sleeve	nos	input
M-187	Tube anchorage set complete with bearing plate, permanent wedges etc	nos	45.00
M-188	Unslaked lime	tonne	3069.00
M-189	Water	KL	225.00
M-190	Water based cement paint	litre	110.85
M-191	Welded steel wire fabric	kg	37.07
M-192	Wire mesh 50mm x 50mm size of 3mm wire	kg	37.07
M-193	Wooden ballies 2" Dia for bracing (Sal)	each	24.00
M-194	Wooden ballies 8" Dia and 9 m long (9 m @ Rs. 43.00/m) - Sal	each	580.50
M-195	Wooden packing	cum	input
M-196	Wooden staff for fastening of flag 25 mm dia, 1.0 m long	each	30.00
M-197	Bitumin(30/40grade) Ex-Barauni packed	Mt	51378.00
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)(* <b>carriage of fly ash is same as sand</b> )	each	4.50

M-199	Paver block(Excluding VAT)					
	(i) M-35 Grade and 60mm thickness		(a) White		sqm	441.40
			(b) red		sqm	449.33
			©Yellow		sqm	463.44
	(i) M-40 Grade and 80mm thickness		(a) White		sqm	506.60
			(b) red		sqm	519.82
			©Yellow		sqm	536.56
M-200	Kerb stone block M-30 grade(size 375mmx300mm)					95.75

*R. K.*

सदस्य

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

*13.3.13*

सदस्य

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

*13.3.13*

सदस्य

राज्यस्तरीय अनुसूचित दर समिति—सह—परियोजना संयोजक, नल कूप प्रभाग, लघु जल संसाधन, विभाग, बिहार, पटना

*13/3/13*

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति—सह—मुख्य अभियंता (असै0) बिहार राज्य बिजली बोर्ड, बिहार, पटना

*13/03/13*

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति—सह—मुख्य अभियंता ऊर्जा विभाग, बिहार पटना।

*13/3/13*

सदस्य

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

*13/3/13*

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति सह—अभियंता प्रमुख, लोक अभियंत्रण विभाग, बिहार, पटना

*13/3/13*

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण समिति – सह—अभियंता प्रमुख ग्रामीण कार्य विभाग, बिहार, पटना

*13/3/13*

संयोजक

राज्यस्तरीय अनुसूचित दर निर्धारण समिति—सह—अभियंता प्रमुख स्वास्थ्य पथ निर्माण विभाग, बिहार, पटना

## INPUT

Schedule- P & M / MORTH-1A						
<b>Approved Usages Rates of plants and machinery. The Usages charges for the machines include ownership charges, cost of repair &amp; maintenance including replacement of tyre and running and operating charges which includes crew, fuel &amp; lubricants. These rates are for the preparation of Schedule of Rates only.</b>						
Sl. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate
		1	2	3	4	6
P&M-001	Air Compressor	General Purpose	capacity in cfm	170/250	hour	405.00
P&M-002	Batching and Mixing Plant (a) 30 cum capacity	Concrete Mixing	cum/hour	20	hour	2325.00
P&M-003	Batching and Mixing Plant (b) 15 - 20 cum capacity	Concrete Mixing	cum/hour	13	hour	1511.00
P&M-004	Bitumen Pressure Distributor	Applying bitumen tack coat	sqm/hour	1750	hour	1356.00
P&M-005	Bitumen Boiler oil fired	Bitumen Spraying	capacity in litre	1500	hour	251.00
P&M-006	Concrete Paver Finisher with 40 HP Motor	Paving of concrete surface	cum / hour	20	hour	1236.00
P&M-007	Concrete Pump of 45 & 30 cum capacity	Pumping of concrete	cum / hour	33 / 22	hour	323.00
P&M-008	Concrete Bucket	For Pouring concrete	capacity in cum	1	hour	20.00
P&M-009	Concrete Mixer (a) 0.4/0.28 cum	Concrete Mixing	cum/hour	2.5	hour	58.00
P&M-010	Concrete Mixer (b) 1 cum	Concrete Mixing	cum/hour	7.5	hour	174.00
P&M-011	Crane (a) 80 tonnes	Lifting Purpose			hour	1617.00
P&M-012	Cranes b) 35 tonnes	Lifting Purpose			hour	1079.00
P&M-013	Cranes c) 3 tonnes	Lifting Purpose			hour	452.00
P&M-014	Dozer D - 80 - A 12	Spreading /Cutting / Clearing	cum/hour	300/ 150/250	hour	4704.00
P&M-015	Dozer D - 50 - A 15	Spreading /Cutting / Clearing	cum/hour	200/ 120/150	hour	2789.00
P&M-016	Emulsion Pressure Distributor	Applying emulsion tack coat	sqm/hour	1750	hour	1011.00
P&M-017	Front End loader 1 cum bucket capacity	Soil loading / Aggregate loading	cum/hour	60 /25	hour	1071.00
P&M-018	Generator (a) 125 KVA	Generation of electric Energy	KVA	100	hour	2062.00
P&M-019	Generator (b) 63 KVA	Generation of electric Energy	KVA	50	hour	893.00
P&M-020	GSB Plant 50 cum	Producing GSB	cum/hour	40	hour	1314.00
P&M-021	Hotmix Plant - 120 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	40	hour	39379.00
P&M-022	Hotmix Plant - 100 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	30	hour	29942.00
P&M-023	Hotmix Plant - 60 to 90 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	25	hour	25209.00
P&M-024	Hotmix Plant - 40 to 60 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	17	hour	17598.00
P&M-025	Hydraulic Chip Spreader	Surface Dressing	sqm/hour	1500	hour	3332.00
P&M-026	Hydraulic Excavator of 1 cum bucket	Soil Ordinary/Soil Marshy / Soil	cum/hour	60 /60 /60	hour	1646.00
P&M-027	Integrated Stone Crusher 100THP	Crushing of Spalls	TPH	100	hour	10957.00
P&M-028	Integrated Stone Crusher 200 HP	Crushing of Spalls	TPH	200	hour	23050.00
P&M-029	Kerb Casting Machine	Kerb Making	Rm/hour	80	hour	392.00



## INPUT

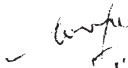
P&M-030	Mastic Cooker	Mastic Wearing coat	capacity in tonne	1	hour	78.00
P&M-031	Mechanical Broom Hydraulic	Surface Cleaning	sqm/hour	1250	hour	422.00
P&M-032	Motor Grader 3.35 mtr blade	Clearing /Spreading /GSB /WBM	cum/hour	200/200/50/50	hour	2435.00
P&M-033	Mobile slurry seal equipment	Mixing and laying slurry seal	sqm/hour	2700	hour	1275.00
P&M-034	Paver Finisher Hydrostatic with sensor control 100 TPH	Paving of DBM/ BM/SDC/ Premix	cum/hour	40	hour	2889.00
P&M-035	Paver Finisher Mechanical 100 TPH	Paving of WMM /Paving of DLC	cum/hour	40/30	hour	1123.00
P&M-036	Piling Rig with Bantonite Pump	0.75 m dia to 1.2 m dia Boring	Rm/hour	2 to 3	hour	6909.00
P&M-037	Pneumatic Road Roller	Rolling of Asphalt Surface	cum/hour	25	hour	1573.00
P&M-038	Pneumatic Sinking Plant	Pneumatic Sinking of wells	cum/hour	1.5 to 2.00	hour	5273.00
P&M-039	Pot Hole Repair Machine	Repair of potholes	cum/hour	4	hour	1146.00
P&M-040	Prestressing Jack with Pump & access	Stressing of steel wires/stands			hour	163.00
P&M-041	Ripper	Scarifying	cum/hour	60	hour	36.00
P&M-042	Rotavator	Scarifying	cum/hour	25	hour	22.00
P&M-043	Road marking machine	Road marking	Sqm/hour	100	hour	118.00
P&M-044	Smooth Wheeled Roller 8 tonne	Soil Compaction /BM Compaction	cum/hour	70/25	hour	604.00
P&M-045	Tandem Road Roller	Rolling of Aspalt Surface	cum/hour	30	hour	1447.00
P&M-046	Tipper - 5 cum	Transportation of soil, GSB, WMM,	Capacity in cum	5.5	km	31.00
P&M-047	Tipper - 5 cum	Transportation of soil, GSB, WMM,	Capacity in cum	5.5	tonne.km	6.85
P&M-048	Tipper - 5 cum	Transportation of soil, GSB, WMM,	Capacity in cum	5.5	hour	787.00
P&M-049	Transit Mixer 4.0/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	hour	1176.00
P&M-050	Transit Mixer 4/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	tonne.km	6.00
P&M-051	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	hour	1079.00
P&M-052	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	tonne.km	8.00
P&M-053	Tractor	Pulling	capacity in HP	50	hour	459.00
P&M-054	Tractor with Rotevator	Rate of Tractor + Rotevator			hour	480.00
P&M-055	Tractor with Ripper	Rate of Tractor 6+ Ripper			hour	494.00
P&M-056	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	km	28.00
P&M-057	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	hour	782.00
P&M-058	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	tonne.km	3.00
P&M-059	Vibratory Roller 8 tonne	Earth or soil / GSB / WBM	cum/hour	100/60/60	hour	1614.00
P&M-060	Water Tanker	Water Transport	capacity in KL	6	hour	154.00
P&M-061	Water Tanker	Water Transport	capacity in KL	6	km	31.00

## INPUT


P&M-062	Wet Mix Plant 60 TPH	Wet Mix	cum/hour	25	hour	1523.00
P&M-063	Air compressor with pneumatic chisel attachment for cutting hard clay.				hour	784.00
P&M-064	Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour				hour	3136.00
P&M-065	Belt conveyor system				hour	input
P&M-066	Boat to carry atleast 20 persons				hour	196.00
P&M-067	Cement concrete batch mix plant @ 175 cum per hour (effective output)				hour	6584.00
P&M-068	Cement concrete batch mix plant @ 75 cum per hour				hour	2822.00
P&M-069	Cold milling machine @ 20 cum per hour				hour	1176.00
P&M-070	Crane 5 tonne capacity				hour	1079.00
P&M-071	Crane 10 tonne capacity				hour	1079.00
P&M-072	Crane 15 tonne capacity				hour	1079.00
P&M-073	Crane 20 tonne capacity				hour	1079.00
P&M-074	Crane 40 T capacity				hour	1617.00
P&M-075	Crane with grab 0.75 cum capacity				hour	1617.00
P&M-076	Compressor with guniting equipment along with accessories				hour	196.00
P&M-077	Drum mix plant for cold mixes of appropriate capacity but not less than 75 tonnes/hour.				hour	1523.00
P&M-078	Epoxy Injection gun				hour	147.00
P&M-079	Generator 33 KVA				hour	470.00
P&M-080	Generator 100 KVA				hour	1532.00
P&M-081	Generator 250 KVA				hour	2896.00
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	295.00
P&M-084	Jack for Lifting 40 tonne lifting capacity.				day	1079.00
P&M-085	Piling rig Including double acting pile driving hammer (Hydraulic rig)				hrs	6909.00
P&M-086	Plate compactor				hour	392.00
P&M-087	Snow blower equipment 140 HP @ 600 cum per hour				hour	input
P&M-088	Texturing machine (for rigid pavement)				hour	99.00
P&M-089	Truck Trailor 30 tonne capacity				hour	3136.00
P&M-090	Truck Trailor 30 tonne capacity				t.km	3.00
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	2297.00
P&M-094	Wet Mix Plant 75 TPH				hour	2297.00

रिक्त  
सदस्य

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

  
सदस्य 13.3.13


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

  
सदस्य 13.3.13


राज्यस्तरीय अनुसूचित दर  
समिति-सह-परियोजना संयोजक,  
नल कूप प्रभाग, लघु जल संसाधन,  
विभाग, बिहार, पटना

सदस्य

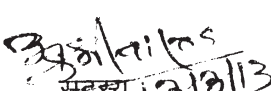
राज्यस्तरीय अनुसूचित दर निर्धारण  
निर्धारणसमिति-सह-मुख्य अभियंता (असै0)  
बिहार राज्य बिजली बोर्ड, बिहार, पटना

  
सदस्य 13.10.13

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-मुख्य अभियंता  
ऊर्जा विभाग, बिहार पटना।

  
सदस्य 13/10


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

  
सदस्य 13/10/13

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

रिक्त  
सदस्य

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

  
संयोजक

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति- सह-अभियंता प्रमुख स्वास्थ्य  
पथ निर्माण विभाग, बिहार, पटना


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


Dt. :- 16-11-12

**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	Unit	Rate
	WMM Paver Finisher	Paving of WMM/Paving of DLC.	Cum/hour	hour	1308.00
	Tipping Truck 14 M ^3	Transportation of Soil, GSB, WMM, Hot mix etc.	Capacity in cum	hour	1795.00
	6.5 KVA Generator	Generation of electric Energy	KVA	hour	184.00
	Vibratory Earth Compactor		Cum/hour	hour	1440.00
	Tractor (25 HP)	Carriage	25 HP Capacity	hour	392.00


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 राज्य विजली बोर्ड, बिहार, पटना

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

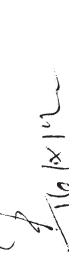
सदस्य, राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-अभियंता प्रमुख,  
ग्रामीण कार्य विभाग, बिहार, पटना

सदस्य, राज्यस्तरीय अनुसूचित दर निर्धारण समिति-सह-मुख्य अभियंता ऊर्जा विभाग,  
बिहार, पटना

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

सदस्य, राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-परियोजना संयोजक, नल कृष प्रभाग,  
लघु जल संसाधन विभाग, बिहार, पटना।

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

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

Schedule - HMP1

Dt.: 16-11-12

134

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

P&M Code	Machinery	Unit	Quantity	Rate	Cost
P&M-024	Hot mix HMP 40-60 TPH @ 37.4 tonne per hour actual output	hour	6.000	17598.00	105588.00
P&M-031	Mechanical broom hydraulic @ 1250 sqm per hour	hour	2.200	422.00	928.40
P&M-035	Paver finisher Mechanical	hour	6.000	1123.00	6738.00
	OR				
P&M-034	Sensor Paver Finisher	hour	6.000	2889.00	17334.00
P&M-018	Generator 125 KVA	hour	6.000	2062.00	12372.00
P&M-017	Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00
P&M-044	Smooth wheeled Roller 8-10 tonnes for initial break down rolling ,final and finishing rolling	hour	12.00 x 0.65*	604.00	4711.20
P&M-059	Vibratory Roller 8 -10 tonnes for intermediate rolling	hour	6.00 x 0.65*	1614.00	6294.60

Total cost of usages charge using Paver Finisher (mech.) in Rupees **143058.20**

Total cost of usages charge using Paver Finisher (Sensor) in Rupees **153654.20**

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

(a)	cost per MT with Mechanical Paver finisher (with 0.0 km lead)	<b>143058.20 / 224.4</b>	<b>637.5143</b>
		Say	<b>638.00 Rupees/MT</b>
		And	
(b)	cost per MT with Sensor Paver finisher (with 0.0 km lead)	<b>153654.20 / 224.4</b>	<b>684.7335</b>
		Say	<b>685.00 Rupees/MT</b>

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

(i) For carriage of Mix by Tipper @Rs.6.85 per t-km will be charged 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,  
मयन निर्माण विभाग, बिहार, पटना

सदस्य, राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख (अर्थी)  
बिहार राज्य लिजली बोर्ड, बिहार, पटना

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

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

सदस्य, राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-परियोजना संयोजक, मल कृषि प्रवर्धन,  
सद्यु जल संसाधन विभाग, बिहार, पटना

सदस्य, राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख, सऊदीदरी परियोजना  
निर्माण विभाग, बिहार, पटना

संयोजक, राज्यस्तरीय अनुसूचित दर निर्धारण समिति  
-सह-अभियंता प्रमुख,  
पथ निर्माण विभाग, बिहार, पटना

## Schedule - WMP1

Dt.: 16-11-12

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

P&M Code	Machinery	Unit	Quantity	Rate	Cost
P&M-094	Wet Mix Macadam Plant 75 TPH @ 68.75 tonne per hour actual output	hour	6.000	2297.00	13782.00
P&M-031	Mechanical broom hydraulic @ 1250 sqm per hour	hour	2.200	422.00	928.40
	WMM Paver finisher	hour	6.000	1308.00	7848.00
P&M-080	Generator 100 KVA	hour	6.000	1532.00	9192.00
P&M-017	Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00
P&M-044	Smooth wheeled Roller 8-10 tonnes for initial break down rolling	hour	6.00 x 0.65*	604.00	2355.60
P&M-059	Vibratory Roller 8-10 tonnes intermediate rolling	hour	6.00 x 0.65*	1614.00	6294.60
	Vibratory Earth Compactor	hour	6.00 x 0.65*	1440.00	5616.00

**Total cost in Rupees****52442.60**

Output of Plant =

31.25\*2.2\*6=

412.5 MT per day

Cost per MT (with 0.0 km Lead)=

52442.60 / 412.5 =

127.13

Say=

127.00

Rupees / MT

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

**For carriage of Mix by Tipper @ 6.85 per t-km will be charge 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,

मवन निर्माण विभाग, बिहार, पटना

सदस्य, राज्यस्तरीय अनुसूचित दर निर्धारण

समिति-सह-मुख्य अभियंता(असौ०)

बिहार राज्य बिजली बोर्ड, बिहार, पटना

सदस्य, राज्यस्तरीय अनुसूचित दर निर्धारण समिति

-सह-अभियंता प्रमुख, लोक स्वास्थ्य,

अभियंत्रण विभाग, बिहार, पटना

सदस्य राज्यस्तरीय अनुसूचित दर निर्धारण समिति

समिति-सह-अभियंता प्रमुख,

ग्रामीण कार्य विभाग, बिहार, पटना

सदस्य राज्यस्तरीय अनुसूचित दर निर्धारण

समिति-सह-मुख्य अभियंता ऊर्जा विभाग,

बिहार, पटना

सदस्य, राज्यस्तरीय अनुसूचित दर निर्धारण

समिति-सह-अभियंता प्रमुख,

जल संसाधन विभाग, बिहार, पटना

सदस्य राज्यस्तरीय अनुसूचित दर निर्धारण समिति

-सह-परियोजना संयोजक, नल कूप प्रभाग,

लघु जल संसाधन विभाग, बिहार, पटना।

सदस्य राज्यस्तरीय अनुसूचित दर निर्धारण समिति

-सह-अभियंता प्रमुख, तकनीकी परीक्षण कोषांग,

निगरानी विभाग, बिहार, पटना।

संयोजक, राज्यस्तरीय अनुसूचित दर निर्धारण

समिति-सह-अभियंता प्रमुख,

पथ निर्माण विभाग, बिहार, पटना।

# INPUT

(A) Usage Rates of Plant and Machinery						
Sl. No.	Description of Machine	Activity	Output of Machine	Output	Unit	Rate
P&M-001	Air Compressor	General Purpose	capacity in cfm	170/250	hour	405.00
P&M-002	Batching and Mixing Plant (a) 30 cum capacity	Concrete Mixing	cum/hour	20	hour	2325.00
P&M-003	Batching and Mixing Plant (b) 15 - 20 cum capacity	Concrete Mixing	cum/hour	13	hour	1511.00
P&M-004	Bitumen Pressure Distributor	Applying bitumen tack coat	sqm/hour	1750	hour	1356.00
P&M-005	Bitumen Boiler oil fired	Bitumen Spraying	capacity in litre	1500	hour	251.00
P&M-006	Concrete Paver Finisher with 40 HP Motor	Paving of concrete surface	cum / hour	20	hour	1236.00
P&M-007	Concrete Pump of 45 & 30 cum capacity	Pumping of concrete	cum / hour	33 / 22	hour	323.00
P&M-008	Concrete Bucket	For Pouring concrete	capacity in cum	1	hour	20.00
P&M-009	Concrete Mixer (a) 0.4/0.28 cum	Concrete Mixing	cum/hour	2.5	hour	58.00
P&M-010	Concrete Mixer (b) 1 cum	Concrete Mixing	cum/hour	7.5	hour	174.00
P&M-011	Crane (a) 80 tonnes	Lifting Purpose			hour	1617.00
P&M-012	Cranes b) 35 tonnes	Lifting Purpose			hour	1079.00
P&M-013	Cranes c) 3 tonnes	Lifting Purpose			hour	452.00
P&M-014	Dozer D - 80 - A 12	Spreading /Cutting / Clearing	cum/hour	300/ 150/250	hour	4704.00
P&M-015	Dozer D - 50 - A 15	Spreading /Cutting / Clearing	cum/hour	200/ 120/150	hour	2789.00
P&M-016	Emulsion Pressure Distributor	Applying emulsion tack coat	sqm/hour	1750	hour	1011.00
P&M-017	Front End loader 1 cum bucket capacity	Soil loading / Aggregate loading	cum/hour	60 /25	hour	1071.00
P&M-018	Generator (a) 125 KVA	Generation of electric Energy	KVA	100	hour	2062.00
P&M-019	Generator( b) 63 KVA	Generation of electric Energy	KVA	50	hour	893.00
P&M-020	GSB Plant 50 cum	Producing GSB	cum/hour	40	hour	1314.00
P&M-021	Hotmix Plant - 120 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	40	hour	39379.00
P&M-022	Hotmix Plant - 100 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	30	hour	29942.00
P&M-023	Hotmix Plant - 60 to 90 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	25	hour	25209.00
P&M-024	Hotmix Plant - 40 to 60 TPH capacity	DBM/BM/SDC/ Premix	cum/hour	17	hour	17598.00
P&M-025	Hydraulic Chip Spreader	Surface Dressing	sqm/hour	1500	hour	3332.00
P&M-026	Hydraulic Excavator of 1 cum bucket	Soil Ordinary/Soil Marshy / Soil Unsuitable	cum/hour	60 /60 /60	hour	1646.00
P&M-027	Integrated Stone Crusher 100THP	Crushing of Spalls	TPH	100	hour	10957.00
P&M-028	Integrated Stone Crusher 200 HP	Crushing of Spalls	TPH	200	hour	23050.00
P&M-029	Kerb Casting Machine	Kerb Making	Rm/hour	80	hour	392.00
P&M-030	Mastic Cooker	Mastic Wearing coat	capacity in tonne	1	hour	78.00
P&M-031	Mechanical Broom Hydraulic	Surface Cleaning	sqm/hour	1250	hour	422.00
P&M-032	Motor Grader 3.35 mtr blade	Clearing /Spreading /GSB /WBM	cum/hour	200/200/50/ 50	hour	2435.00
P&M-033	Mobile slurry seal equipment	Mixing and laying slurry seal	sqm/hour	2700	hour	1275.00
P&M-034	Paver Finisher Hydrostatic with sensor control 100 TPH	Paving of DBM/ BM/SDC/ Premix	cum/hour	40	hour	2889.00
P&M-035	Paver Finisher Mechanical 100 TPH	Paving of WMM /Paving of DLC	cum/hour	40/30	hour	1123.00
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	6909.00
P&M-037	Pneumatic Road Roller	Rolling of Asphalt Surface	cum/hour	25	hour	1573.00
P&M-038	Pneumatic Sinking Plant	Pneumatic Sinking of wells	cum/hour	1.5 to 2.00	hour	5273.00
P&M-039	Pot Hole Repair Machine	Repair of potholes	cum/hour	4	hour	1146.00
P&M-040	Prestressing Jack with Pump & access	Stressing of steel wires/stands			hour	163.00
P&M-041	Ripper	Scarifying	cum/hour	60	hour	36.00
P&M-042	Rotavator	Scarifying	cum/hour	25	hour	22.00
P&M-043	Road marking machine	Road marking	Sqm/hour	100	hour	118.00
P&M-044	Smooth Wheeled Roller 8 tonne	Soil Compaction /BM Compaction	cum/hour	70/25	hour	604.00
P&M-045	Tandem Road Roller	Rolling of Asphalt Surface	cum/hour	30	hour	1447.00
P&M-046	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	km	31.00

## INPUT

P&M-047	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	tonne.km	6.85
P&M-048	Tipper - 5 cum	Transportation of soil, GSB, WMM, Hotmix etc.	Capacity in cum	5.5	hour	787.00
P&M-049	Transit Mixer 4.0/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	hour	1176.00
P&M-050	Transit Mixer 4/4.5 cum	Transportation of Concrete Mix to site	cum/hour	4.5	tonne.km	6.00
P&M-051	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	hour	1079.00
P&M-052	Transit Mixer 3.0 cum	Transportation of Concrete Mix to site	cum/hour	3	tonne.km	8.00
P&M-053	Tractor	Pulling	capacity in HP	50	hour	459.00
P&M-054	Tractor with Rotevator	Rate of Tractor + Rotevator			hour	480.00
P&M-055	Tractor with Ripper	Rate of Tractor 6+ Ripper			hour	494.00
P&M-056	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	km	28.00
P&M-057	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	hour	782.00
P&M-058	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/cum	4.5	tonne.km	3.00
P&M-059	Vibratory Roller 8 tonne	Earth or soil / GSB / WBM	cum/hour	100/60/60	hour	1614.00
P&M-060	Water Tanker	Water Transport	capacity in KL	6	hour	154.00
P&M-061	Water Tanker	Water Transport	capacity in KL	6	km	31.00
P&M-062	Wet Mix Plant 60 TPH	Wet Mix	cum/hour	25	hour	1523.00
<b>Sl. No.</b>	<b>Description of Machine</b>				<b>Unit</b>	<b>Rate</b>
P&M-063	Air compressor with pneumatic chisel attachment for cutting hard clay.				hour	784.00
P&M-064	Batch type cold mixing plant 100-120 TPH capacity producing an average output of 75 tonne per hour				hour	3136.00
P&M-065	Belt conveyor system				hour	input
P&M-066	Boat to carry atleast 20 persons				hour	196.00
P&M-067	Cement concrete batch mix plant @ 175 cum per hour (effective output)				hour	6584.00
P&M-068	Cement concrete batch mix plant @ 75 cum per hour				hour	2822.00
P&M-069	Cold milling machine @ 20 cum per hour				hour	1176.00
P&M-070	Crane 5 tonne capacity				hour	1079.00
P&M-071	Crane 10 tonne capacity				hour	1079.00
P&M-072	Crane 15 tonne capacity				hour	1079.00
P&M-073	Crane 20 tonne capacity				hour	1079.00
P&M-074	Crane 40 T capacity				hour	1617.00
P&M-075	Crane with grab 0.75 cum capacity				hour	1617.00
P&M-076	Compressor with guniting equipment along with accessories				hour	196.00
P&M-077	Drum mix plant for cold mixes of appropriate capacity but not less than 75 tonnes/hour.				hour	1523.00
P&M-078	Epoxy Injection gun				hour	147.00
P&M-079	Generator 33 KVA				hour	470.00
P&M-080	Generator 100 KVA				hour	1532.00
P&M-081	Generator 250 KVA				hour	2896.00
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	295.00
P&M-084	Jack for Lifting 40 tonne lifting capacity.				day	1079.00
P&M-085	Piling rig Including double acting pile driving hammer (Hydraulic rig)				hrs	6909.00
P&M-086	Plate compactor				hour	392.00
P&M-087	Snow blower equipment 140 HP @ 600 cum per hour				hour	input
P&M-088	Texturing machine (for rigid pavement)				hour	99.00
P&M-089	Truck Trailor 30 tonne capacity				hour	3136.00
P&M-090	Truck Trailor 30 tonne capacity				t.km	3.00
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	2297.00
P&M-094	Wet Mix Plant 75 TPH				hour	2297.00



# INPUT

## (B) Labour

SI. No.	Description of Labour	Unit	Rate
L-01	Blacksmith (IInd class)	day	190.00
L-02a	Blacksmith (Ist class)	day	213.00
L-02b	Welder	day	239.00
L-02c	Plumber	day	201.00
L-02d	Electrician	day	201.00
L-03	Blaster (Stone cutter)	day	264.00
L-04	Carpenter I Class	day	213.00
L-05	Chiseller (Head Mazdoor)	day	200.00
L-06	Driller (Jumper)	day	190.00
L-07	Diver (Sarang)	day	227.00
L-08	Fitter	day	216.00
L-09	Mali	day	200.00
L-10	Mason (IInd class)	day	190.00
L-11	Mason (Ist class)	day	213.00
L-12	Mate / Supervisor	day	171.00
L-13	Mazdoor	day	157.00
L-14	Mazdoor/Dresser (Semi Skilled)	day	164.00
L-15	Mazdoor/Dresser/Sinker (Skilled)	day	200.00
L-16	Medical Officer	day	626.06
L-17	Operator(grouting)	day	177.00
L-18	Painter I class	day	201.00
L-19	Para medical personnel	day	312.00

# INPUT

(C) Materials				
Sl. No.	Description	Unit	Rate	
M-001	Stone Boulder of size 150 mm and below at Quarry	cum	294.26	
M-002	Supply of quarried stone 150 - 200 mm size for Hand Broken at Quarry	cum	294.26	
M-003	Boulder with minimum size of 300 mm for Pitching at Quarry	cum	294.26	
M-004	Coarse sand at Quarry (Equivalent to Koliwar sand)	cum	133.28	
M-005	Coarse sand at Quarry (Equivalent to Koliwar sand)	cum	133.28	
M-006	Fine sand at Quarry	cum	113.71	
M-007	Moorum at Quarry	cum	127.69	
M-008	Gravel/Quarry spall at Quarry	Cum	294.26	
M-009	Granular Material or hard murrum for GSB works at Quarry	Cum	127.69	
M-010	Granular Material or hard murrum for GSB works at Quarry	Cum	127.69	
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	391.93	
	<b>Description</b>	<b>Unit</b>	<b>Rate at Plant (HMP / Batching)</b>	<b>Rate at Quarry Site</b>
M-013	Close graded Granular sub-base Material 53 mm to 9.5 mm at Quarry	cum	494.46	494.46
M-014	Close graded Granular sub-base Material 37.5 mm to 9.5 mm at Quarry	cum	471.86	471.86
M-015	Close graded Granular sub-base Material 26.5 mm to 9.5 mm at Quarry	cum	529.62	529.62
M-016	Close graded Granular sub-base Material 9.5 mm to 4.75 mm at Quarry	cum	508.74	508.74
M-017	Close graded Granular sub-base Material 9.5 mm to 2.36 mm at Quarry	cum	394.31	394.31
M-018	Close graded Granular sub-base Material 4.75mm to 2.36 mm at Quarry	cum	195.72	195.72
M-019	Close graded Granular sub-base Material 4.75mm to 75 micron mm at Quarry	cum	181.88	181.88
M-020	Close graded Granular sub-base Material 2.36 mm at Quarry	cum	181.88	181.88
M-021	Stone crusher dust finer than 3mm with not more than 10% passing 0.075 sieve at Quarry	cum	92.57	92.57
M-022	Coarse graded Granular sub-base Material 2.36 mm & below at Quarry	cum	181.88	181.88
M-023	Coarse graded Granular sub-base Material 4.75mm to 75 micron mm at Quarry		181.88	181.88
M-024	Coarse graded Granular sub-base Material 4.75 mm to 2.36 mm at Quarry	cum	195.72	195.72
M-025	Coarse graded Granular sub-base Material 9.5 mm to 4.75 mm at Quarry	cum	508.74	508.74
M-026	Coarse graded Granular sub-base Material 26.5 mm to 4.75 mm at Quarry	cum	480.94	480.94
M-027	Coarse graded Granular sub-base Material 26.5 mm to 9.5 mm at Quarry	cum	529.62	529.62
M-028	Coarse graded Granular sub-base Material 37.5 mm to 9.5 mm at Quarry	cum	471.86	471.86
M-029	Coarse graded Granular sub-base Material 53 mm to 26.5 mm at Quarry	cum	441.36	441.36
M-030	Aggregates below 5.6 mm at Quarry	cum	195.72	195.72
M-031	Aggregates 22.4 mm to 2.36 mm at Quarry	cum	507.98	507.98
M-032	Aggregates 22.4 mm to 5.6 mm at Quarry	cum	507.98	507.98
M-033	Aggregates 45 mm to 2.8 mm at Quarry	cum	453.47	453.47
M-034	Aggregates 45 mm to 22.4 mm at Quarry	cum	461.26	461.26
M-035	Aggregates 53 mm to 2.8 mm at Quarry	cum	453.47	453.47
M-036	Aggregates 53 mm to 22.4 mm at Quarry	cum	441.36	441.36
M-037	Aggregates 63 mm to 2.8 mm at Quarry	cum	412.37	412.37
M-038	Aggregates 63 mm to 45 mm at Quarry	cum	412.26	412.26

## INPUT

M-039	Aggregates 90 mm to 45 mm at Quarry	cum	382.30	382.30
M-040	Aggregates 10 mm to 5 mm at Quarry	cum	508.74	508.74
M-041	Aggregates 11.2 mm to 0.09 mm at Quarry	cum	333.95	333.95
M-042	Aggregates 13.2 mm to 0.09 mm at Quarry	cum	452.61	452.61
M-043	Aggregates 13.2 mm to 5.6 mm at Quarry	cum	589.97	589.97
M-044	Aggregates 13.2 mm to 10 mm at Quarry	cum	617.12	617.12
M-045	Aggregates 20 mm to 10 mm at Quarry	cum	617.12	617.12
M-046	Aggregates 25 mm to 10 mm at Quarry	cum	588.46	588.46
M-047	Aggregates 19 mm to 6 mm at Quarry	cum	507.98	507.98
M-048	Aggregates 37.5 mm to 19 mm at Quarry	cum	461.26	461.26
M-049	Aggregates 37.5 mm to 25 mm at Quarry	cum	461.26	461.26
M-050	Aggregates 6 mm nominal size at Quarry	cum	394.20	394.20
M-051	Aggregates 10 mm nominal size at Quarry	cum	589.97	589.97
M-052	Aggregates 13.2/12.5 mm nominal size at Quarry	cum	617.12	617.12
M-053	Aggregates 20 mm nominal size at Quarry	cum	529.62	529.62
M-054	Aggregates 25 mm nominal size at Quarry	cum	505.28	505.28
M-055	Aggregates 40 mm nominal size at Quarry	cum	425.02	425.02

*दिवान*

सदस्य

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

*दिवान*  
13/3/13

सदस्य

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

*दिवान*  
13-3-13

सदस्य

राज्यस्तरीय अनुसूचित दर  
समिति-सह-परियोजना संयोजक,  
नल कूप प्रभाग, लघु जल संसाधन,  
विभाग, बिहार, पटना

*मुख्य अभियंता*

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
निर्धारणसमिति-सह-मुख्य अभियंता (असै0)  
बिहार राज्य बिजली बोर्ड, बिहार, पटना

*मुख्य अभियंता*  
13/02/13

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-मुख्य अभियंता  
ऊर्जा विभाग, बिहार पटना।

*संयोजक*  
13/3/13

सदस्य

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

*मुख्य अभियंता*  
13/3/13

सदस्य

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

*दिवान*

सदस्य

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

*संयोजक*  
12/03/13

संयोजक

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति- सह-अभियंता प्रमुख स्वास्थ्य  
पथ निर्माण विभाग, बिहार, पटना

# INPUT

Sl. No.	Description	Unit	Rate
M-056	AC pipe 100 mm dia	metre	44.72
M-057	Acrylic polymer bonding coat	litre	input
M-058	Alluminium Paint	litre	117.65
M-059	Aluminium alloy plate 2mm Thick	sqm	9000.00
M-060	Aluminium alloy/galvanised steel	tonne	36000.00
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	8400.00
M-062	Road Stud with Micro Prismatic lense reflectors( with shank)	each	165.00
M-063	Barbed wire	kg	52.94
M-064	Bearing (Cost of parts)	nos	input
M-065	Bearing (Cast steel rocker bearing assembly of 250 tonne )	nos	74250.00
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	0.58
M-067	Bearing (Forged steel roller bearing of 250 tonne	nos	44550.00
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	input
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	30000.00
M-071	Bentonite	kg	3.171
M-072	Binding wire	kg	53.85
M-073	Bitumen ( Cationic Emulsion ) Ex- Patna (M.S) Packed	tonne	43116.00
M-074	Bitumen (60-70 grade) Ex- Barauni Packed	tonne	48460.30
M-075	Bitumen (80-100 grade ) Ex- Barauni Packed	tonne	47544.90
M-076	Bitumen (Cutback ) Ex- Barauni Packed(60/70)	tonne	48460.30
M-077	Bitumen (emulsion) Ex- Patna (M.S) Packed	tonne	43116.00
M-078	Bitumen (modified graded) Ex - Barauni (CRMB - 55) Packed	tonne	48563.30
M-079	Brick - Patna Urban	each	5.636
M-080	C.I.shoes for the pile	kg	47.06
M-081	Cement (OPC) at Patna	tonne	5462.00
M-082	TMT bars (HYSD Bars) ( average rate of Fe 500)	tonne	42812.50
M-083	Coller for joints 300 mm dia	nos	0.00
M-084	Compressible Fibre Board(20mm thick)	sqm	801.00
M-085	Connectors/ Staples	each	input
M-086	Copper Plate(12m long x 250mmwide)	kg	690.13
M-087	Corrosion resistant Structural steel	tonne	43326.51
M-088	Corrugated sheet, 3 mm thick, "Thrie" beam section railing	kg	48.63
M-089	Credit for excavated rock found suitable for use	cum	135.00
M-090	Curing compound	litre	120.00
M-091	Delineators from ISI certified firm as per the standard drawing given in IRC - 79	each	774.40
M-092	Earth Cost or compensation for earth taken from private land	cum	23.650
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	25725.00
M-094	Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	100 nos	600.00
M-095	Epoxy compound with accessories for preparing epoxy mortar	kg	525.00
M-096	Epoxy mortar	kg	720.00
M-097	Epoxy primer	kg	12.00
M-098	Epoxy resin-hardner mix for prime coat	kg	637.50

# INPUT

M-099	Flag of red color cloth 600 x 600 mm	each	45.00
M-100	Flowering Plants	each	30.00
M-101	Galvanised MS flat clamp	nos	14.87
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	93.906
M-103	Galvanised structural steel plate 200 mm wide, 6 mm thick, 24 m long	kg	43.29
M-104	Gelatin 80%	kg	643.63
M-105	Geo grids	sqm	input
M-106	Geomembrane	sqm	input
M-107	Geonets	sqm	103.13
M-108	Geotextile	sqm	80.63
M-109	Geotextile filter fabric	sqm	80.63
M-110	GI bolt 10 mm Dia	nos	15.00
M-111	Grouting pump with agitator	hour	150.00
M-112	Grass (Doob)	kg	3.89
M-113	Grass (Fine)	kg	3.89
M-114	HDPE pipes 75mm dia	metre	202.50
M-115	HDPE pipes 90mm dia	metre	202.50
M-116	Hedge plants	each	30.00
M-117	Helical pipes 600mm diameter	metre	input
M-118	Hot applied thermoplastic compound (Sp. Gravity - 2.10)	litre	195.17
M-119	HTS strand	tonne	66566.75
M-120	Joint Sealant Compound	kg	24.00
M-121	Jute netting, open weave, 2.5 cm square opening for seeding and Mulching	sqm	37.50
M-122	LDO for steam curing	litre	input
M-123	M.S. Clamps	nos	32.07
M-124	M.S. Clamps	kg	58.05
M-125	M.S.shoes @ 35 Kg per pile of 15 m	kg	22.20
M-126	Mild Steel bars (Average of M6)	tonne	43971.42
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	28350.00
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	58.03
M-131	Paint	litre	217.80
M-132	Pavement Marking Paint	litre	217.80
M-133	Paving Fabric	sqm	input
M-134	Perforated geosynthetic pipe 150 mm dia	metre	25.58
M-135	Perforated pipe of cement concrete, internal dia 100 mm	metre	108.00
M-136	Pesticide	kg	68.40
M-137	Pipes 200 mm dia, 2.5 m long for drainage	metre	165.00
M-138	Plastic sheath, 1.25 mm thick for dowel bars	sqm	15.00
M-139	Plastic tubes 50 cm dia, 1.2 m high	nos	input
M-140	Polymer braids	metre	input

## INPUT

M-141	Pre moulded Joint filler,25 mm thick for expansion joint.	sqm	937.50
M-142	Pre-coated stone chips of 13.2 mm nominal size	cum	617.12
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	937.50
M-145	Pre-packed cement based polymer concrete of strength 45 Mpa at 28 days	kg	input
M-146	Primer	kg	12.00
M-147	Quick setting compound	kg	input
M-148	Random Rubble Stone	cum	294.26
M-149	RCC Pipe NP 4 heavy duty non pressure pipe 1000 mm dia	metre	2811.63
M-150	RCC Pipe NP 4 heavy duty non pressure pipe 1200 mm dia	metre	3997.25
M-151	RCC Pipe NP 4 heavy duty non pressure pipe 300 mm dia	metre	514.90
M-152	Reflectorsing glass beads	kg	63.43
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	7.50
M-159	Sand bags (Cost of sand and Empty cement bag)	nos	6.73
M-160	Sapling 2 m high 25 mm dia	each	22.50
M-161	Scrap tyres of size 900 x 20	nos	75.00

*दिव्य*

सदस्य

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

*किशोर*  
13.3.13

सदस्य

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

*अनुराग*  
13.3.13

सदस्य

राज्यस्तरीय अनुसूचित दर  
समिति-सह-परियोजना संयोजक,  
नल कूप प्रभाग, लघु जल संसाधन,  
विभाग, बिहार, पटना

*मुकुटजयराज*

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
निर्धारणसमिति-सह-मुख्य अभियंता (असै0)  
बिहार राज्य बिजली बोर्ड, बिहार, पटना

*अनुराग*  
13/3/13

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-मुख्य अभियंता  
ऊर्जा विभाग, बिहार पटना।

*अनुराग*  
13/3/13

सदस्य

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

*अनुराग*  
13/3/13

सदस्य

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

*दिव्य*

सदस्य

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

*अनुराग*  
13/03/13

संयोजक

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति- सह-अभियंता प्रमुख स्वास्थ्य  
पथ निर्माण विभाग, बिहार, पटना

# INPUT

M-162	Seeds		kg	30.00
M-163	Selected earth (Including royalty @ Rs. 22.0 per cum & compensation @ Rs. 1.65 per cum)		cum	23.65
M-164	Separation Membrane of impermeable plastic sheeting 125 micron thick		sqm	15.00
M-165	Sheathing duct		metre	82.50
M-166	Shrubs		each	15.00
M-167	Sludge / Farm yard manure @ 0.18 cum per 100 sqm at site of work for turfing		cum	675.00
M-168	Sodium vapour lamp		each	input
M-169	Square Rubble Coursed Stone		cum	294.26
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	120.00
M-173	Steel helmet and cushion block on top of pile head during driving.		kg	39.52
M-174	Steel pipe 25 mm external dia as per IS:1239		metre	123.54
M-175	Steel pipe 50 mm external dia as per IS:1239		metre	221.11
M-176	Steel wire rope 20 mm		kg	38.29
M-177	Steel wire rope 40 mm		kg	38.29
M-178	Strip seal expansion join		metre	7980.95
M-179	Structural Steel ( average rate of M6+M8+M9)		tonne	44879.36
M-180	Super plastisizer admixture IS marked as per 9103-1999		kg	150.00
M-181	Synthetic Geogrids as per clause 3102.8 and approved design and specifications.		sqm	input
M-182	Through and bond stone		each	11.25
M-183	Tie rods 20mm diameter		nos	input
M-184	Tiles size 300 x 300 mm and 25 mm thick		each	37.50
M-185	Timber		cum	41550.00
M-186	Traffic cones with 150 mm reflective sleeve		nos	input
M-187	Tube anchorage set complete with bearing plate, permanent wedges etc		nos	45.00
M-188	Unslaked lime		tonne	3069.00
M-189	Water		KL	225.00
M-190	Water based cement paint		litre	110.85
M-191	Welded steel wire fabric		kg	37.07
M-192	Wire mesh 50mm x 50mm size of 3mm wire		kg	37.07
M-193	Wooden ballies 2" Dia for bracing		each	24.00
M-194	Wooden ballies 8" Dia and 9 m long (9 m @ Rs. 64.5.00/m)		each	580.50
M-195	Wooden packing		cum	input
M-196	Wooden staff for fastening of flag 25 mm dia, 1.0 m long		each	30.00
M-197	Bituen (30/40 grade) Ex-Barauni Packed		MT	51378.00
M-198	Fly Ash Brick conforming to IS: 3812 ( Part I & II ) (Excluding the carrige cost* of Fly Ash from point of production to Kiln site) (*Carrige cost of fly ash is same as sand)		each	4.501
M-199	Paver Block (Excluding VAT )			
	(i) M -35 Grade and 60 mm thickness	(a) White	sqm	441.40
		(b) Red	sqm	449.33
		(c) Yellow	sqm	463.44
	(ii) M-40 Grade and 80mm thickness	(a) White	sqm	506.60
		(b) Red	sqm	519.82
		(c) Yellow	sqm	536.56
M-200	Kerb- Stone Block- M30 Grade (Size375mm x 300mm x150mm )		each	95.75

## INPUT

Overheads for Road Works	0.1	}				
Contractors profit for Road Works	0.1					
Overheads for Bridge Works	0.25	}	for input of Overheads or Contractors profit please type in column C as like below			
Overheads for Bridge Works (Rehabilitation)	0.3		Type symbol of apostrophe(') then input value then one space then symble of percentage (%) for example ' 08 %			
Contractors profit for Bridge Works	0.1					
Lead from Mixing Plant to working site	1 km					
Lead for E/W borow area to site	1 km					

*[Signature]*

सदस्य

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

*[Signature]*  
13/3/13

सदस्य

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

*[Signature]*  
13-3-13

सदस्य

राज्यस्तरीय अनुसूचित दर  
समिति-सह-परियोजना संयोजक,  
नल कूप प्रभाग, लघु जल संसाधन,  
विभाग, बिहार, पटना

*[Signature]*

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
निर्धारणसमिति-सह-मुख्य अभियंता (असै0)  
बिहार राज्य बिजली बोर्ड, बिहार, पटना

*[Signature]*  
13/02/13

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-मुख्य अभियंता  
ऊर्जा विभाग, बिहार पटना।

*[Signature]*  
13/3/13

सदस्य

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

*[Signature]*  
13/3/13

सदस्य

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

*[Signature]*

सदस्य

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

*[Signature]*  
12/06/13

संयोजक

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति- सह-अभियंता प्रमुख स्वास्थ्य  
पथ निर्माण विभाग, बिहार, पटना



# INPUT

Items No.	Summary of Rates calculated and used for analysis of rates of other items	Unit	Rate
Item 8.3	Printing new letter and figures of any shade (ii) English Roman	per cm height per letter	0.34
Item 8.8	Painting Two Coats on New Concrete Surfaces	sqm	57.00
Item 8.9	Painting angle iron post two coats	sqm	50.00
Item 12.6 (B)	Cement mortar 1:2 (Excluding OH & CP)	cum	3943.00
Item 12.6 (A)	Cement mortar 1:3 (Excluding OH & CP)	cum	3074.00
Item 12.6 (D)	Cement mortar 1:6 (Excluding OH & CP)	cum	1899.00
Item 12.7 (A)	Course Rubble masonry in cement mortar 1:3 (including OH & CP)	cum	2680.00
Item 12.7 (Addl.B)	Random Rubble masonry in cement mortar 1:6 (including OH & CP)	cum	2132.00
Item 12.8 (A)	PCC Grade M15 including OH & CP for Open Foundation by Mixer	cum	3733.00
Item 12.8 (A)	PCC Grade M15 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	2611.00
Item 12.8 (B) PCC	PCC Grade M20 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	2841.00
Item 12.8 (C)	RCC Grade M20 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	2908.00
Item 12.8 (C) RCC	RCC Grade M20 including OH & CP for Open Foundation by Batching Plant	cum	4160.00
Item 12.8 (C)	RCC Grade M20 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	2910.00
Item 12.8 (D)	PCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3143.00
Item 12.8 (D)	PCC Grade M25 including OH & CP for Open Foundation by Batching Plant	cum	4489.00
Item 12.8 (D)	PCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3147.00
Item 12.8 (E)	RCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3214.00
Item 12.8 (E)	RCC Grade M25 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3457.00
Item 12.8 (F)	PCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3176.00
Item 12.8 (F)	PCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3177.00
Item 12.8 (G)	RCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3232.00
Item 12.8 (G)	RCC Grade M30 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3235.00
Item 12.8 (H) Case I	RCC Grade M35 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3315.00
Item 12.8 (H) Case II	RCC Grade M35 including OH & CP for Open Foundation by Batching Plant	cum	5058.00
Item 12.8 (H)	RCC Grade M35 excluding OH & CP for Open Foundation by Batching Plant	cum	3678.00
Item 12.8 (H)	RCC Grade M35 for Open Foundation Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3572.00
Item 12.11 (C) i	PCC Grade M20 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3350.00
Item 12.11 (C) i	PCC Grade M20 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Batching Plant	cum	3220.00
Item 12.11 (C) ii	PCC Grade M25 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Machinery by Mixer	cum	3540.00
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	3409.00

# INPUT

Item 12.11 (C) iii	PCC Grade M30 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Mechinery by Mixer	cum	3573.00
Item 12.11 (C) iii	PCC Grade M30 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Mechinery by Batching Plant	cum	3443.00
Item 12.11 (C) iv	PCC Grade M35 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Mechinery by Mixer	cum	3650.00
Item 12.11 (C) iv	PCC Grade M35 including OH & CP for Well Foundation (Bottom Plug) by Batching Plant	cum	5049.00
Item 12.11 (C) iv	PCC Grade M35 for Open Foundation (Bottom Plug) Per Cum Basic Cost of Labour, Material & Mechinery by Batching Plant	cum	3518.00
Item 12.11 (F) iv	RCC Grade M35 including OH & CP for Well Foundation (Well Cap) by Batching Plant	cum	4699.00
Item No. 3.13 A	Excavation for Structures (Manual Means)	cum	159.00
Item No. 3.13 B	Excavation for Structures (Mechanical Meanse)	cum	45.00
Item 14.1(A)	RCC Grade M20 for super-structure including OH & CP by Batching Plant	cum	4745.00
Item 14.1(B)	RCC Grade M25 for super-structure including OH & CP by Batching Plant	cum	5273.00
Item 14.1(E)	PSC Grade M-40 for super-structure including OH & CP by Batching Plant	cum	6317.00
Item 14.1(C) case II	RCC Grade M30 for super-structure including formwork and excluding OH & CP by Batching Plant	cum	3883.00
Item 14.1(C) case II	RCC Grade M30 for super-structure excluding formwork and excluding OH & CP by Batching Plant	cum	3238.00
Item 14.2 A	Supplying ,fitting and placing HYSD bar reinforcement in super-structure excluding OH & CP	tonne	47355.00
Item 13.6	Supplying, fitting and placing HYSD including OH & CP for sub-structure	tonne	64324.00
Item 5.17	Fog Seal	sqm	39.98
Item 5.21 Case-I	Crack Prevention courses. Case-I Stress Absorbing Membrane (SAM) crack width less than 6 mm	sqm	55.00
Item 5.21 Case-II	Crack Prevention courses. Case-II Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm	sqm	68.00
Item 5.21 Case-III	Crack Prevention courses. Case-III Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 %	sqm	90.00
Item 5.21 Case-IV	Crack Prevention courses. Case-IV Bitumen Impregnated Geotextile	sqm	165.00
Item 5.15 Case-I	Slurry Seal Case I, 5 mm thickness	sqm	67.00
Item 5.15 Case-II	Slurry Seal Case II, 3 mm thickness	sqm	47.00
Item 5.15 Case-III	Slurry Seal Case III, 1.5 mm thickness	sqm	29.10
Item 5.9 Case-I	Surface Dressing Case I, 19 mm nominal chipping size	sqm	80.00
Item 5.9 Case-II	Surface Dressing Case II, 13 mm nominal chipping size	sqm	68.00

*Signature*

सदस्य

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

*Signature*  
13.3.13

सदस्य

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

*Signature*  
13.3.13

सदस्य

राज्यस्तरीय अनुसूचित दर  
समिति-सह-परियोजना संयोजक,  
नल कूप प्रभाग, लघु जल संसाधन,  
विभाग, बिहार, पटना

*Signature*  
सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
निर्धारणसमिति-सह-मुख्य अभियंता (असै०)  
बिहार राज्य बिजली बोर्ड, बिहार, पटना

*Signature*  
13/02/13

सदस्य

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति-सह-मुख्य अभियंता  
ऊर्जा विभाग, बिहार पटना।

*Signature*  
सदस्य

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

*Signature*  
सदस्य

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

सदस्य

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

*Signature*  
संयोजक

राज्यस्तरीय अनुसूचित दर निर्धारण  
समिति- सह-अभियंता प्रमुख स्वास्थ्य  
पथ निर्माण विभाग, बिहार, पटना

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

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

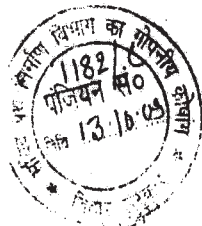
New Delhi, dt. 6-10-2009

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:



930/1114  
14/1/10  
13/10/09

S. O. 12 - Commercial  
14/1/10

13/10/09

136  
13/10/09

2/-

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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 have 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 Rs. 50 crores                      8 Per cent

- 4. Contractor Profit**    10 per cent of cost of works

Contractor 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.

**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 include 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.

**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.

- 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,

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 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.

# 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 Rs. 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.

## Summary of Rate Analysis

### CHAPTER-1

Item No.	Descriptions	Unit	Rate (in Rs.)
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	135.00
1.2	<b>Loading and Unloading of Boulders by Manual Means</b>	cum	160.00
1.3	<b>Loading and Unloading of Cement or Steel by Manual Means and stacking.</b>	tonne	229.00
1.4	<b>Cost of Haulage Excluding Loading and Unloading</b>		
(i)	<b>Surfaced Road</b>	tonne.km	6.60
(ii)	<b>Unsurfaced Gravelled Road</b>	tonne.km	7.90
(iii)	<b>Katcha Track and Track in river bed / nallah bed and choe bed.</b>	tonne.km	15.90
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	689.00
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	793.00
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	673.00
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	568.00



**Analysis of Rate  
Chapter - 1**

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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					
		<i>Unit = cum</i>					
		<i>Taking output = 5.5 cum</i>					
		<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	787.00	259.71	P&M-048
		Front end-loader 1 cum bucket capacity @ 25 cum/hour	hour	0.330	1071.00	353.43	P&M-017
		<b>b) Overhead charges @ 0.1 on (a)</b>				61.31	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				67.45	
		Cost for 5.5 cum = a+b+c				741.90	
		<b>Rate per cum = (a+b+c)/ 5.5</b>				134.89	
	Note	Unloading will be by tipping.			<i>say</i>	<i>135.00</i>	
1.2		<b>Loading and Unloading of Boulders by Manual Means</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 5.5 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.110	171.00	18.81	L-12
		Mazdoor for loading and unloading	day	0.750	157.00	117.75	L-13
		<b>b) Machinery</b>					
		Tipper 5.5 tonne capacity	hour	0.750	787.00	590.25	P&M-048
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				72.68	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				79.95	
		Cost for 5.5 cum = a+b+c+d				879.44	
		<b>Rate per cum = (a+b+c+d)/5.5</b>				159.90	
	Note	Unloading will be by tipping.			<i>say</i>	<i>160.00</i>	
1.3		<b>Loading and Unloading of Cement or Steel by Manual Means and Stacking.</b>					
		<i>Unit = tonne</i>					
		<i>Taking output = 10 tonnes</i>					
		<b>a) Labour</b>					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor for loading and unloading	day	2.000	157.00	314.00	L-13
		<b>b) Machinery</b>					
		Truck 10 tonne capacity	hour	2.000	782.00	1564.00	P&M-057
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				189.17	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				208.08	
		Cost for 10 tonnes = a+b+c+d				2288.93	
		<b>Rate per tonnes = (a+b+c+d)/10</b>				228.89	
					<i>say</i>	<i>229.00</i>	
1.4		<b>Cost of Haulage Excluding Loading and Unloading</b>					
		Haulage of materials by tipper excluding cost of loading, unloading and stacking.					
		<i>Taking output 10 tonnes load and lead 10 km = 100 t.km</i>					
	(i)	<b>Surfaced Road</b>					

**Analysis of Rate  
Chapter - 1**

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks / Input ref.
		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	787.00	314.80	P&M-048
		Time taken for empty return trip.	hour	0.290	787.00	228.23	P&M-048
		<b>b) Overhead charges @ 0.1 on (a)</b>				54.30	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				59.73	
		cost for 100 t km = a+b+c				657.07	
		<b>Rate per t.km = (a+b+c)/100</b>				6.57	
					<i>say</i>	<u>6.60</u>	
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	787.00	393.50	P&M-048
		Time taken for empty return trip	hour	0.330	787.00	259.71	P&M-048
		<b>b) Overhead charges @ 0.1 on (a)</b>				65.32	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				71.85	
		Cost for 100 t .km = a+b+c				790.38	
		<b>Rate per t.Km = (a+b+c)/100</b>				7.90	
					<i>say</i>	<u>7.90</u>	
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	787.00	787.00	P&M-048
		Time taken for empty return trip	hour	0.670	787.00	527.29	P&M-048
		<b>b) Overhead charges @ 0.1 on (a)</b>				131.43	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				144.57	
		Cost for 100 t .km = a+b+c				1590.29	
		<b>Rate per t.Km = (a+b+c)/100</b>				15.90	
					<i>say</i>	<u>15.90</u>	

**Analysis of Rate  
Chapter - 1**

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.060	171.00	10.26	L-12
		Mazdoor	day	1.500	157.00	235.50	L-13
		<b>b) Material</b>					
		Supply of quarried stone 150 - 200 mm size	cum	1.100	294.26	323.69	M-002
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				56.94	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				62.64	
		<b>Rate per cum = a+b+c+d</b>				689.03	
					<i>say</i>	<i>689.00</i>	
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.					
		<i>Unit = cum</i>					
		<i>Taking Output = 600 cum at crusher locatlon.</i>					
		<b>a) Labour</b>					
		Mate	day	0.760	171.00	129.96	L-12
		Mazdoor Skilled	day	2.000	200.00	400.00	L-15
		Mazdoor including breaking of any oversize boulder.	day	17.000	157.00	2669.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	294.26	235408.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	23050.00	138300.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	1071.00	21420.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	787.00	15740.00	P&M-048
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				41406.70	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				45547.37	
		Cost for 600 cum = (a+b+c+d+e)x0.95				475969.97	
		<b>Rate per cum = (a+b+c+d+e) * 0.95 / 600</b>				<b>793.28</b>	
					<i>say</i>	<i>793.00</i>	
		<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.					

**Analysis of Rate  
Chapter - 1**

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks / Input ref.
		<i>Unit = cum</i>					
		<i>Taking Output = 670 cum at crusher location.</i>					
		<b>a) Labour</b>					
		Mate	day	0.760	171.00	129.96	L-12
		Mazdoor Skilled	day	2.000	200.00	400.00	L-15
		Mazdoor including breaking of any size boulder.	day	17.000	157.00	2669.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	294.26	235408.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	23050.00	138300.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	1071.00	21420.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	787.00	15740.00	P&M-048
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				41406.70	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				45547.37	
		Cost for 670 cum = (a+b+c+d+e)x0.90				450918.92	
		<b>Rate per cum = (a+b+c+d+e) * 0.90 / 670</b>				<b>673.01</b>	
					<i>say</i>	<b>673.00</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.					
		<i>Unit = cum</i>					
		<i>Taking Output = 750 cum at crusher location.</i>					
		<b>a) Labour</b>					
		Mate	day	0.760	171.00	129.96	L-12
		Mazdoor Skilled	day	2.000	200.00	400.00	L-15
		Mazdoor	day	17.000	157.00	2669.00	L-13
		<b>b) Material</b>					
		Stone Boulder of size 150 mm and below	cum	800.000	294.26	235408.00	M-001
		<b>c) Machinery</b>					
		Integrated stone crusher of 200 TPH including belt conveyor and vibrating screens	Hour	6.000	23050.00	138300.00	P&M-028
		Front end loader 1 cum bucket capacity	Hour	20.000	1071.00	21420.00	P&M-017
		Tipper 5.5 cum capacity	Hour	20.000	787.00	15740.00	P&M-048
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				41406.70	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				45547.37	
		Cost for 750 cum = (a+b+c+d+e)x0.85				425867.87	
		<b>Rate per cum = (a+b+c+d+e)x0.85/750</b>				<b>567.82</b>	
					<i>say</i>	<b>568.00</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.					

## 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-kilometrage.
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.

## Summary of Rate Analysis

### CHAPTER-2 SITE CLEARANCE

Item No.	Descriptions	Unit	Rate (in Rs.)
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	174.00
(ii)	<b>Girth from 600 mm to 900 mm</b>	each	346.00
(iii)	<b>Girth from 900 mm to 1800 mm</b>	each	619.00
(iv)	<b>Girth above 1800 mm</b>	each	1126.00
2.2	<b>Clearing Grass and Removal of Rubbish</b>	hectare	9912.00
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	30292.00
B	<b>In area of thorny jungle</b>	hectare	40760.00
(ii)	<b>By Mechanical Means</b>		
A	<b>In area of light jungle</b>	hectare	58267.00
B	<b>In area of thorny jungle</b>	hectare	70325.00
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	279.00
B	<b>Cement Concrete Grade M-15 &amp; M-20</b>	cum	318.00
C	<b>Prestressed / Reinforced cement concrete grade M-20 &amp; above</b>	cum	728.00
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	464.00
B	<b>Prestressed / Reinforced cement concrete grade M-20 &amp; above</b>	cum	715.00
(ii)	<b>Dismantling Brick / Tile work</b>		
A	<b>In lime mortar</b>	cum	199.00
B	<b>In cement mortar</b>	cum	239.00
C	<b>In mud mortar</b>	cum	183.00
D	<b>Dry brick pitching or brick soling</b>	cum	175.00
(iii)	<b>Dismantling Stone Masonry</b>		
A	<b>Rubble stone masonry in lime mortar</b>	cum	215.00
B	<b>Rubble stone masonry in cement mortar.</b>	cum	239.00
C	<b>Rubble Stone Masonry in mud mortar.</b>	cum	199.00
D	<b>Dry rubble masonry</b>	cum	191.00
E	<b>Dismantling stone pitching/ dry stone spalls.</b>	cum	183.00
F	<b>Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials.</b>	cum	199.00
(iv)	<b>Wood work wrought framed and fixed in frames of trusses upto a height of 5 m above plinth level</b>	cum	385.00
(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	875.00

## Summary of Rate Analysis

<b>B</b>	<b>Excluding dismembering.</b>	tonne	663.00
<b>C</b>	<b>Extra over item No( V ) A and( V ) B for cutting rivets.</b>	each	6.00
<b>(vi)</b>	<b>Scraping of bricks dismantled from brick work including stacking.</b>		
<b>A</b>	<b>In lime/Cement mortar</b>	1000 numbers	694.00
<b>B</b>	<b>In mud mortar</b>	1000 numbers	248.00
<b>(vii)</b>	<b>Scraping of Stone from dismantled stone masonry</b>		
<b>A</b>	<b>In cement and lime mortar</b>	cum	278.00
<b>B</b>	<b>In Mud mortar</b>	cum	59.00
<b>(viii)</b>	<b>Scarping plaster in lime or cement mortar from brick/ stone masonry</b>	sqm	9.70
<b>(ix)</b>	<b>Removing all type of hume pipes and stacking within a lead of 1000 metres including earthwork and dismantling of masonry works.</b>		
<b>A</b>	<b>Up to 600 mm dia</b>	metre	103.00
<b>B</b>	<b>Above 600 mm to 900 mm dia</b>	metre	139.00
<b>C</b>	<b>Above 900 mm</b>	metre	238.00
<b>2.5</b>	<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)		
<b>I</b>	<b>By Manual Means</b>		
<b>A</b>	<b>Bituminous courses</b>	cum	508.00
<b>B</b>	<b>Granular courses</b>	cum	382.00
<b>II</b>	<b>By Mechanical Means</b>		
<b>A</b>	<b>Bituminous course</b>	cum	280.00
<b>2.6</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)	cum	1270.00
<b>2.7</b>	<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	58.00
<b>2.8</b>	<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	14.00
<b>2.9</b>	<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	21.00
<b>2.10</b>	<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.)		
<b>A</b>	<b>5th KM stone</b>	each	253.00
<b>B</b>	<b>Ordinary KM Stone</b>	each	155.00
<b>C</b>	<b>Hectometre Stone</b>	each	30.90
<b>2.11</b>	<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	29.30
<b>2.12</b>	<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	97.00
<b>2.13</b>	<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	183.00
<b>2.14</b>	<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	111.00

**Analysis of Rate**

**CHAPTER - 2  
SITE CLEARANCE**

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.1	201	Cutting of Trees, including cutting of Trunks, Branches and Removal					
		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.					
		<i>Unit = Each</i>					
	(i)	Girth from 300 mm to 600 mm					
		a) Labour					
		Mate	day	0.020	171.00	3.42	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	157.00	94.20	L-13
		b) Machinery					
		Tractor-trolley	hour	0.100	459.00	45.90	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				14.35	
		d) Contractor's profit @ 0.1 on (a+b+c)				15.79	
		Rate for each tree = a+b+c+d				173.66	
					<i>say</i>	<u>174.00</u>	
2.1	(ii)	Girth from 600 mm to 900 mm					
		a) Labour					
		Mate	day	0.040	171.00	6.84	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	157.00	141.30	L-13
		b) Machinery					
		Tractor-trolley	hour	0.300	459.00	137.70	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				28.58	
		d) Contractor's profit @ 0.1 on (a+b+c)				31.44	
		Rate for each tree = a+b+c+d				345.87	
					<i>say</i>	<u>346.00</u>	
2.1	(iii)	Girth from 900 mm to 1800 mm					
		a) Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoors for cutting trees including cutting, refilling, compaction of backfilling and stacking of serviceable materials within 1000 metres	day	2.000	157.00	314.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.400	459.00	183.60	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				51.13	
		d) Contractor's profit @ 0.1 on (a+b+c)				56.24	
		Rate for each tree = a+b+c+d				618.65	
					<i>say</i>	<u>619.00</u>	
2.1	(iv)	Girth above 1800 mm					
		a) Labour					
		Mate	day	0.160	171.00	27.36	L-12
		Mazdoors for cutting trees including cutting, refilling, compaction of backfilling and stacking of serviceable materials within 1000 metres	day	4.000	157.00	628.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.600	459.00	275.40	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				93.08	
		d) Contractor's profit @ 0.1 on (a+b+c)				102.38	
		Rate for each tree = a+b+c+d				1126.22	
					<i>say</i>	<u>1126.00</u>	



**Analysis of Rate**

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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>					
		<i>Unit = Hectare</i>					
		<i>Taking output = 1 Hectare</i>					
		a) Labour					
		Mate	day	2.000	171.00	342.00	L-12
		Mazdoor	day	50.000	157.00	7850.00	L-13
		b) Overhead charges @ 0.1 on (a)				819.20	
		c) Contractor's profit @ 0.1 on (a+b)				901.12	
		Rate per Hectare = a+b+c				9912.32	
						<i>say</i>	<u>9912.00</u>
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.					
		<i>Unit = Hectare</i>					
		<i>Taking output = 1 Hectare</i>					
	(i)	By Manual Means:-					
	A	In area of light jungle					
		a) Labour					
		Mate	day	6.000	171.00	1026.00	L-12
		Mazdoor	day	150.000	157.00	23550.00	L-13
		b) Machinery					
		Tractor-trolley	hour	1.000	459.00	459.00	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				2503.50	
		d) Contractor's profit @ 0.1 on (a+b+c)				2753.85	
		Rate per Hectare = a+b+c+d				30292.35	
						<i>say</i>	<u>30292.00</u>
2.3 (i)	B	In area of thorny jungle					
		a) Labour					
		Mate	day	8.000	171.00	1368.00	L-12
		Mazdoor	day	200.000	157.00	31400.00	L-13
		b) Machinery					
		Tractor-trolley	hour	2.000	459.00	918.00	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				3368.60	
		d) Contractor's profit @ 0.1 on (a+b+c)				3705.46	
		Rate per Hectare = a+b+c+d				40760.06	
						<i>say</i>	<u>40760.00</u>
2.3	(ii)	By Mechanical Means					
	A	In area of light jungle					
		a) Labour					
		Mate	day	0.160	171.00	27.36	L-12
		Mazdoor	day	4.000	157.00	628.00	L-13
		b) Machinery					
		Dozer 80 HP with attachment for removal of trees & stumps	hour	10.000	4704.00	47040.00	P&M-014
		Tractor-trolley	hour	1.000	459.00	459.00	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				4815.44	
		d) Contractor's profit @ 0.1 on (a+b+c)				5296.98	
		Rate per Hectare = a+b+c+d				58266.78	
						<i>say</i>	<u>58267.00</u>

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.3 (ii)		B	In area of thorny jungle					
			a) Labour					
			Mate	day	0.240	171.00	41.04	L-12
			Mazdoor	day	6.000	157.00	942.00	L-13
			b) Machinery					
			Dozer 80 HP with attachment for removal of trees & stumps	hour	12.000	4704.00	56448.00	P&M-014
			Tractor-trolley	hour	1.500	459.00	688.50	P&M-053
			c) Overhead charges @ 0.1 on (a+b)				5811.95	
			d) Contractor's profit @ 0.1 on (a+b+c)				6393.15	
			Rate per Hectare = a+b+c+d				70324.64	
						say	<u>70325.00</u>	
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					
			<i>Unit = cum</i>					
			<i>Taking output = 1.25 cum</i>					
		(i)	Lime /Cement Concrete					
		I	By Manual Means					
		A	Lime Concrete, cement concrete grade M-10 and below					
			a) Labour					
			Mate	day	0.040	171.00	6.84	L-12
			Mazdoor for dismantling and loading	day	1.000	157.00	157.00	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
			c) Overhead charges @ 0.1 on (a+b)				28.78	
			d) Contractor's profit @ 0.1 on (a+b+c)				31.65	
			Cost for 1.25 cum = a+b+c+d				348.20	
			Rate per cum = (a+b+c+d)/ 1.25				278.56	
						say	<u>279.00</u>	
2.4 (i)		B	Cement Concrete Grade M-15 & M-20					
			a) Labour					
			Mate	day	0.050	171.00	8.55	L-12
			Mazdoor for dismantling and loading	day	1.250	157.00	196.25	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
			c) Overhead charges @ 0.1 on (a+b)				32.87	
			d) Contractor's profit @ 0.1 on (a+b+c)				36.16	
			Cost for 1.25 cum = a+b+c+d				397.76	
			Rate per cum = (a+b+c+d)/ 1.25				318.21	
						say	<u>318.00</u>	
2.4 (i)		C	Prestressed / Reinforced cement concrete grade M-20 & above					
			a) Labour					
			Mate	day	0.150	171.00	25.65	L-12
			Blacksmith	day	0.250	213.00	53.25	L-02a
			Mazdoor for dismantling, loading and unloading	day	3.500	157.00	549.50	L-13
			b) Machinery					
			Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
			c) Overhead charges @ 0.1 on (a+b)				75.23	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Contractor's profit @ 0.1 on (a+b+c)				82.76	
		Cost for 1.25 cum = a+b+c+d				910.32	
		Rate per cum = (a+b+c+d)/ 1.25				728.26	
					say	<u>728.00</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	171.00	3.42	L-12
		Mazdoor for loading and unloading	day	0.250	157.00	39.25	L-13
		Mazdoor with Pneumatic breaker	day	0.250	164.00	41.00	L-14
		b) Machinery					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1.5 cum per hour	hour	0.670	405.00	271.35	P&M-001
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				47.90	
		d) Contractor's profit @ 0.1 on (a+b+c)				52.68	
		Cost for 1.25 cum = a+b+c+d				579.53	
		Rate per cum = (a+b+c+d)/ 1.25				463.62	
					say	<u>464.00</u>	
2.4 II	B	Prestressed / reinforced cement concrete grade M-20 & above					
		a) Labour					
		Mate	day	0.050	171.00	8.55	L-12
		Mazdoor with Pneumatic breaker	day	0.660	164.00	108.24	L-14
		Blacksmith	day	0.250	213.00	53.25	L-02a
		Mazdoor for loading and unloading	day	0.250	157.00	39.25	L-13
		b) Machinery					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1.00 cum per hour	hour	1.000	405.00	405.00	P&M-001
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				73.82	
		d) Contractor's profit @ 0.1 on (a+b+c)				81.20	
		Cost for 1.25 cum = a+b+c+d				893.25	
		Rate per cum = (a+b+c+d)/ 1.25				714.60	
					say	<u>715.00</u>	
2.4	(ii)	Dismantling Brick / Tile work					
	A	In lime mortar					
		a) Labour					
		Mate	day	0.020	171.00	3.42	L-12
		Mazdoor for dismantling, loading and unloading	day	0.500	157.00	78.50	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				20.59	
		d) Contractor's profit @ 0.1 on (a+b+c)				22.64	
		Cost for 1.25 cum = a+b+c+d				249.08	
		Rate per cum = (a+b+c+d)/ 1.25				199.26	
					say	<u>199.00</u>	
2.4 (ii)	B	In cement mortar					
		a) Labour					
		Mate	day	0.030	171.00	5.13	L-12
		Mazdoor for dismantling, loading and unloading	day	0.750	157.00	117.75	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				24.68	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Contractor's profit @ 0.1 on (a+b+c)				27.15	
		Cost for 1.25 cum = a+b+c+d				298.64	
		Rate per cum = (a+b+c+d)/ 1.25				238.91	
					say	<u>239.00</u>	
2.4 (ii)	C	In mud mortar					
		a) Labour					
		Mate	day	0.016	171.00	2.74	L-12
		Mazdoor for dismantling and loading	day	0.400	157.00	62.80	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				18.95	
		d) Contractor's profit @ 0.1 on (a+b+c)				20.84	
		Cost for 1.25 cum = a+b+c+d				229.25	
		Rate per cum = (a+b+c+d)/ 1.25				183.40	
					say	<u>183.00</u>	
2.4 (ii)	D	Dry brick pitching or brick soling					
		a) Labour					
		Mate	day	0.014	171.00	2.39	L-12
		Mazdoor for Dismantling, loading and unloading	day	0.350	157.00	54.95	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				18.13	
		d) Contractor's profit @ 0.1 on (a+b+c)				19.94	
		Cost for 1.25 cum = a+b+c+d				219.34	
		Rate per cum = (a+b+c+d)/ 1.25				175.47	
					say	<u>175.00</u>	
2.4	(iii)	Dismantling Stone Masonry					
	A	Rubble stone masonry in lime mortar					
		a) Labour					
		Mate	day	0.024	171.00	4.10	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.600	157.00	94.20	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				22.22	
		d) Contractor's profit @ 0.1 on (a+b+c)				24.45	
		Cost for 1.25 cum = a+b+c+d				268.90	
		Rate per cum = (a+b+c+d)/ 1.25				215.12	
					say	<u>215.00</u>	
2.4 (iii)	B	Rubble stone masonry in cement mortar.					
		a) Labour					
		Mate	day	0.030	171.00	5.13	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.750	157.00	117.75	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				24.68	
		d) Contractor's profit @ 0.1 on (a+b+c)				27.15	
		Cost for 1.25 cum = a+b+c+d				298.64	
		Rate per cum = (a+b+c+d)/ 1.25				238.91	
					say	<u>239.00</u>	
2.4 (iii)	C	Rubble Stone Masonry in mud mortar.					
		a) Labour					
		Mate	day	0.020	171.00	3.42	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.500	157.00	78.50	L-13

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Machinery					
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				20.59	
		d) Contractor's profit @ 0.1 on (a+b+c)				22.64	
		Cost for 1.25 cum = a+b+c+d				249.08	
		Rate per cum = (a+b+c+d)/ 1.25				199.26	
					say	<u>199.00</u>	
2.4 (iii)	D	Dry rubble masonry					
		a) Labour					
		Mate	day	0.018	171.00	3.08	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.450	157.00	70.65	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				19.77	
		d) Contractor's profit @ 0.1 on (a+b+c)				21.74	
		Cost for 1.25 cum = a+b+c+d				239.17	
		Rate per cum = (a+b+c+d)/ 1.25				191.33	
					say	<u>191.00</u>	
2.4 (iii)	E	Dismantling stone pitching/ dry stone spalls.					
		a) Labour					
		Mate	day	0.016	171.00	2.74	L-12
		Mazdoor for dismantling, loading and unloading.	day	0.400	157.00	62.80	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				18.95	
		d) Contractor's profit @ 0.1 on (a+b+c)				20.84	
		Cost for 1.25 cum = a+b+c+d				229.25	
		Rate per cum = (a+b+c+d)/ 1.25				183.40	
					say	<u>183.00</u>	
2.4 (iii)	F	Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials.					
		a) Labour					
		Mate	day	0.020	171.00	3.42	L-12
		Mazdoor for dismantling, loading and unloading	day	0.500	157.00	78.50	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				20.59	
		d) Contractor's profit @ 0.1 on (a+b+c)				22.64	
		Cost for 1.25 cum = a+b+c+d				249.08	
		Rate per cum = (a+b+c+d)/ 1.25				199.26	
					say	<u>199.00</u>	
2.4	(iv)	Wood Work wrought framed and fixed in frames of trusses upto a height of 5 m above plinth level					
		a) Labour					
		Mate	day	0.060	171.00	10.26	L-12
		Carpenter	day	0.500	213.00	106.50	L-04
		Mazdoor for dismantling, loading and unloading.	day	1.000	157.00	157.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.270	459.00	123.93	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				39.77	
		d) Contractor's profit @ 0.1 on (a+b+c)				43.75	
		Cost for 1.25 cum = a+b+c+d				481.20	
		Rate per cum = (a+b+c+d)/ 1.25				384.96	
					say	<u>385.00</u>	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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.					
		<i>Unit = tonne</i>					
		<i>Taking output = 1 tonne</i>					
	A	Including dismembering					
	a)	Labour					
		Mate	day	0.140	171.00	23.94	L-12
		Blacksmith	day	1.000	213.00	213.00	L-02a
		Mazdoor for dismantling, loading and unloading	day	2.500	157.00	392.50	L-13
		Add 2.5 per cent of cost of labour for gas cutting, ropes, pulleys etc.				15.74	
	b)	Machinery					
		Tractor-trolley	hour	0.170	459.00	78.03	P&M-053
	c)	Overhead charges @ 0.1 on (a+b)				72.32	
	d)	Contractor's profit @ 0.1 on (a+b+c)				79.55	
		Rate per tonne = a+b+c+d				875.08	
					<i>say</i>	<u>875.00</u>	
2.4 (v)	B	Excluding dismembering.					
	a)	Labour					
		Mate	day	0.220	171.00	37.62	L-12
		Mazdoor for dismantling, loading and unloading	day	2.000	157.00	314.00	L-13
		Blacksmith	day	0.500	213.00	106.50	L-02a
		Add 2.5 per cent of cost of labour for gas cutting, ropes, pulleys etc.				11.45	
	b)	Machinery					
		Tractor-trolley	hour	0.170	459.00	78.03	P&M-053
	c)	Overhead charges @ 0.1 on (a+b)				54.76	
	d)	Contractor's profit @ 0.1 on (a+b+c)				60.24	
		Rate per tonne = a+b+c+d				662.60	
					<i>say</i>	<u>663.00</u>	
2.4 (v)	C	Extra over item No(v) A and(v) B for cutting rivets.					
		<i>Unit = each</i>					
		<i>Taking output = 10 rivets</i>					
	a)	Labour					
		Mate	day	0.010	171.00	1.71	L-12
		Blacksmith	day	0.130	213.00	27.69	L-02a
		Mazdoor	day	0.130	157.00	20.41	L-13
	b)	Overhead charges @ 0.1 on (a)				4.98	
	c)	Contractor's profit @ 0.1 on (a+b)				5.48	
		Cost for 10 rivets = a+b+c				60.27	
		Rate for each rivet = (a+b+c)/10				6.03	
					<i>say</i>	<u>6.00</u>	
2.4	(vi)	Scrapping of Bricks Dismantled from Brick Work including Stacking.					
		<i>Unit = numbers</i>					
		<i>Taking output = 1000 numbers</i>					
	A	In lime/Cement mortar					
	a)	Labour					
		Mate	day	0.140	171.00	23.94	L-12
		Mazdoor	day	3.500	157.00	549.50	L-13
	b)	Overhead charges @ 0.1 on (a)				57.34	
	c)	Contractor's profit @ 0.1 on (a+b)				63.08	
		Rate per1000 Nos = a+b+c				693.86	
					<i>say</i>	<u>694.00</u>	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.4 (iv)		B	In mud mortar					
			a) Labour					
			Mate	day	0.050	171.00	8.55	L-12
			Mazdoor	day	1.250	157.00	196.25	L-13
			b) Overhead charges @ 0.1 on (a)				20.48	
			c) Contractor's profit @ 0.1 on (a+b)				22.53	
			Rate per 1000 Nos = a+b+c				247.81	
						<i>say</i>	<u>248.00</u>	
2.4		(vii)	Scraping of Stone from Dismantled Stone Masonry					
			<i>Unit = cum</i>					
			<i>Taking output = 1 cum</i>					
		A	In cement and lime mortar					
			a) Labour					
			Mate	day	0.060	171.00	10.26	L-12
			Mazdoor	day	1.400	157.00	219.80	L-13
			b) Overhead charges @ 0.1 on (a)				23.01	
			c) Contractor's profit @ 0.1 on (a+b)				25.31	
			Rate per cum = a+b+c				278.37	
						<i>say</i>	<u>278.00</u>	
2.4 (vii)		B	In Mud mortar					
			a) Labour					
			Mate	day	0.010	171.00	1.71	L-12
			Mazdoor	day	0.300	157.00	47.10	L-13
			b) Overhead charges @ 0.1 on (a)				4.88	
			c) Contractor's profit @ 0.1 on (a+b)				5.37	
			Rate per cum = a+b+c				59.06	
						<i>say</i>	<u>59.00</u>	
2.4		(viii)	Scarping Plaster in Lime or Cement Mortar from Brick/Stone Masonry					
			<i>Unit = sqm</i>					
			<i>Taking output = 100 sqm</i>					
			a) Labour					
			Mate	day	0.160	171.00	27.36	L-12
			Mazdoor for scarping and loading	day	4.000	157.00	628.00	L-13
			b) Machinery					
			Tractor-trolley	hour	0.320	459.00	146.88	P&M-053
			c) Overhead charges @ 0.1 on (a+b)				80.22	
			d) Contractor's profit @ 0.1 on (a+b+c)				88.25	
			Cost for 100 sqm = a+b+c+d				970.71	
			Rate per sqm = (a+b+c+d)/100				9.71	
						<i>say</i>	<u>9.70</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.					
			<i>Unit = metre</i>					
			<i>Taking output = 1 metre</i>					
		A	Up to 600 mm dia					
			a) Labour					
			Mate	day	0.020	171.00	3.42	L-12
			Mazdoor	day	0.520	157.00	81.64	L-13
			b) Overhead charges @ 0.1 on (a)				8.51	
			c) Contractor's profit @ 0.1 on (a+b)				9.36	
			Rate per metre = a+b+c				102.92	
						<i>say</i>	<u>103.00</u>	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
2.4 (ix)		B	Above 600 mm to 900 mm dia					
			a) Labour					
			Mate	day	0.030	171.00	5.13	L-12
			Mazdoor	day	0.700	157.00	109.90	L-13
			b) Overhead charges @ 0.1 on (a)				11.50	
			c) Contractor's profit @ 0.1 on (a+b)				12.65	
			Rate per metre = a+b+c				139.19	
						<i>say</i>	<u>139.00</u>	
2.4 (ix)		C	Above 900 mm					
			a) Labour					
			Mate	day	0.050	171.00	8.55	L-12
			Mazdoor	day	1.200	157.00	188.40	L-13
			b) Overhead charges @ 0.1 on (a)				19.70	
			c) Contractor's profit @ 0.1 on (a+b)				21.66	
			Rate per metre = a+b+c				238.31	
							<i>say</i>	<u>238.00</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					
			<i>Unit = cum</i>					
			<i>Taking output = 1 cum</i>					
		I	By Manual Means					
		A	Bituminous courses					
			a) Labour					
			Mate	day	0.060	171.00	10.26	L-12
			Mazdoor for dismantling, loading and unloading	day	1.500	157.00	235.50	L-13
			b) Machinery					
			Tractor-trolley	hour	0.380	459.00	174.42	P&M-053
			c) Overhead charges @ 0.1 on (a+b)				42.02	
			d) Contractor's profit @ 0.1 on (a+b+c)				46.22	
			Rate per cum = a+b+c+d				508.42	
							<i>say</i>	<u>508.00</u>
2.5 I		B	Granular courses					
			a) Labour					
			Mate	day	0.040	171.00	6.84	L-12
			Mazdoor for dismantling, loading and unloading.	day	1.000	157.00	157.00	L-13
			b) Machinery					
			Tractor-trolley	hour	0.330	459.00	151.47	P&M-053
			c) Overhead charges @ 0.1 on (a+b)				31.53	
			d) Contractor's profit @ 0.1 on (a+b+c)				34.68	
			Rate per cum = a+b+c+d				381.53	
							<i>say</i>	<u>382.00</u>
2.5		II	By Mechanical Means					
		A	Bituminous course					
			a) Labour					
			Mate	day	0.010	171.00	1.71	L-12
			Mazdoor	day	0.300	157.00	47.10	L-13
			b) Machinery					
			Tractor-trolley	hour	0.380	459.00	174.42	P&M-053



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Farm tractor with ripper @ 60 cum per hour	hour	0.017	494.00	8.40	P&M-055
		c) Overhead charges @ 0.1 on (a+b)				23.16	
		d) Contractor's profit @ 0.1 on (a+b+c)				25.48	
		Rate per cum = a+b+c+d				280.27	
					<i>say</i>	<u>280.00</u>	
2.6	202	Dismantling of Cement Concrete Pavement					
		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					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Labour					
		Mate	day	0.030	171.00	5.13	L-12
		Semi skilled mazdoor for operating pneumatic tools	day	0.500	164.00	82.00	L-14
		Mazdoors as helpers including loading and unloading	day	0.500	157.00	78.50	L-13
		b) Machinery					
		Air compressor 250 cfm with two leads for pneumatic cutters/ hammers @ 1 cum per hour	hour	1.000	405.00	405.00	P&M-001
		Tractor-trolley	hour	0.400	459.00	183.60	P&M-053
		Joint Cutting Machine with 2-3 blades	hour	1.000	295.00	295.00	P&M-083
		c) Overhead charges @ 0.1 on (a+b)				104.92	
		d) Contractor's profit @ 0.1 on (a+b+c)				115.42	
		Rate per cum = a+b+c+d				1269.57	
						<i>say</i>	<u>1270.00</u>
		<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.					
2.7	202	Dismantling of Guard Rails					
		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.					
		<i>Unit = running metre</i>					
		<i>Taking output = 1 metre</i>					
		a) Labour					
		Mate	day	0.006	171.00	1.03	L-12
		Mazdoor including loading and unloading	day	0.150	157.00	23.55	L-13
		b) Machinery					
		Tractor-trolley	hour	0.050	459.00	22.95	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				4.75	
		d) Contractor's profit @ 0.1 on (a+b+c)				5.23	
		Rate per metre = a+b+c+d				57.51	
						<i>say</i>	<u>58.00</u>
2.8	202	Dismantling of Kerb Stone					
		Dismantling kerb stone by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre					
		<i>Unit = running metre</i>					
		<i>Taking output = 10 metre</i>					
		a) Labour					
		Mate	day	0.010	171.00	1.71	L-12
		Mazdoor including loading and unloading	day	0.150	157.00	23.55	L-13

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Machinery					
		Tractor-trolley	hour	0.200	459.00	91.80	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				11.71	
		d) Contractor's profit @ 0.1 on (a+b+c)				12.88	
		Cost for 10 m = a+b+c+d				141.64	
		Rate per metre = (a+b+c+d)/10				14.16	
					say	<u>14.00</u>	
2.9	202	Dismantling of Kerb Stone Channel					
		Dismantling kerb stone channel by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre					
		<i>Unit = running metre</i>					
		<i>Taking output = 10 metre</i>					
		a) Labour					
		Mate	day	0.015	171.00	2.57	L-12
		Mazdoor including loading and unloading	day	0.225	157.00	35.33	L-13
		b) Machinery					
		Tractor-trolley	hour	0.300	459.00	137.70	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				17.56	
		d) Contractor's profit @ 0.1 on (a+b+c)				19.31	
		Cost for 10 m = a+b+c+d				212.46	
		Rate per metre = (a+b+c+d)/10				21.25	
					say	<u>21.00</u>	
2.10	202	Dismantling of Kilometre Stone					
		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.					
		<i>Unit = Each</i>					
		<i>Taking output = one KM stone</i>					
	A	5th KM stone					
		Quantity of cement concrete = 0.392 cum					
		a) Labour					
		Mate	day	0.130	171.00	22.23	L-12
		Mazdoor	day	0.750	157.00	117.75	L-13
		b) Machinery					
		Tractor-trolley	hour	0.150	459.00	68.85	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				20.88	
		d) Contractor's profit @ 0.1 on (a+b+c)				22.97	
		Rate for one 5th KM stone = a+b+c+d				252.68	
					say	<u>253.00</u>	
	B	Ordinary KM Stone					
		Quantity of cement concrete = 0.269 cum					
		a) Labour					
		Mate	day	0.020	171.00	3.42	L-12
		Mazdoor	day	0.500	157.00	78.50	L-13
		b) Machinery					
		Tractor-trolley	hour	0.100	459.00	45.90	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				12.78	
		d) Contractor's profit @ 0.1 on (a+b+c)				14.06	
		Rate for one ordinary KM stone = a+b+c+d				154.66	
					say	<u>155.00</u>	
	C	Hectometre Stone					
		Quantity of cement concrete = 0.048 cum					
		a) Labour					
		Mate	day	0.004	171.00	0.68	L-12

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor	day	0.100	157.00	15.70	L-13
		b) Machinery					
		Tractor-trolley	hour	0.020	459.00	9.18	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				2.56	
		d) Contractor's profit @ 0.1 on (a+b+c)				2.81	
		Rate for one Hectometre stone = a+b+c+d				30.93	
					say	<u>30.90</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.					
		<i>Unit = running metre</i>					
		<i>Taking output = 30 metres</i>					
		a) Labour					
		Mate	day	0.150	171.00	25.65	L-12
		Mazdoor including loading and unloading	day	3.000	157.00	471.00	L-13
		Blacksmith	day	0.750	213.00	159.75	L-02a
		b) Machinery					
		Tractor-trolley	hour	0.150	459.00	68.85	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				72.53	
		d) Contractor's profit @ 0.1 on (a+b+c)				79.78	
		Cost for 30 metres = a+b+c+d				877.55	
		Rate per metre = (a+b+c+d)/30				29.25	
					say	<u>29.30</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					
		<i>Unit = running metre</i>					
		<i>Taking output = 10 metres</i>					
		a) Labour					
		Mate	day	0.090	171.00	15.39	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		Plumber	day	0.250	201.00	50.25	L-02c
		b) Machinery					
		Truck 10 tonne capacity	hour	0.250	782.00	195.50	P&M-057
		Light Crane 3 tonne capacity	hour	0.500	452.00	226.00	P&M-013
		c) Overhead charges @ 0.1 on (a+b)				80.11	
		d) Contractor's profit @ 0.1 on (a+b+c)				88.13	
		Cost for 10 metres = a+b+c+d				969.38	
		Rate per metre = (a+b+c+d)/10				96.94	
					say	<u>97.00</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.
2.13	202	Removal of Cement Concrete Pipe of Sewer Gutter					
		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.					
		<i>Unit = running metre</i>					
		<i>Taking output = 10 metres</i>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		a) Labour						
		Mate	day	0.100	171.00	17.10	L-12	
		Mazdoor	day	2.500	157.00	392.50	L-13	
		b) Machinery						
		Crane 5 tonne capacity	hour	0.300	1079.00	323.70	P&M-070	
		Truck flat body 10 tonne	hour	1.000	782.00	782.00	P&M-057	
		c) Overhead charges @ 0.1 on (a+b)				151.53		
		d) Contractor's profit @ 0.1 on (a+b+c)				166.68		
		Cost for 10 metres = a+b+c+d				1833.51		
		Rate per metre = (a+b+c+d)/10				183.35		
					<i>say</i>	<u>183.00</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.					
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						
		<i>Unit = each</i>						
		<i>Taking output = 30 Nos</i>						
		a) Labour						
		Mate	day	0.480	171.00	82.08	L-12	
		Mazdoor	day	10.000	157.00	1570.00	L-13	
		Electrician/Lineman	day	2.000	201.00	402.00	L-02d	
		b) Machinery						
		Tractor-trolley	hour	1.500	459.00	688.50	P&M-053	
		c) Overhead charges @ 0.1 on (a+b)				274.26		
		d) Contractor's profit @ 0.1 on (a+b+c)				301.68		
		Cost for 30 poles = a+b+c+d				3318.52		
		Rate per pole = (a+b+c+d)/30				110.62		
					<i>say</i>	<u>111.00</u>		

## 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-kilometrage.
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.
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.

## 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.

## Summary of Rate Analysis

### CHAPTER-3 EARTH WORK, EROSION CONTROL AND DRAINAGE

Item No.	Descriptions	Unit	Rate (in Rs.)
3.1	<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 @ Rs. 22.0 per cum but excluding the cost of watering, rolling & compaction	cum	175.00
(ii)	Including Royalty @ Rs. 22.0 per cum and cost of watering, rolling & compaction	cum	196.00
<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 @ Rs. 22.00 per cum.	cum	96.00
3.2 (i)	<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 @ Rs. 22.00 per cum but excluding cost of watering , rolling & compaction	cum	216.00
(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 @ Rs. 22.00 per cum and cost of watering , rolling & compaction	cum	238.00
<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 @ Rs. 22.00 per cum.	cum	138.00
3.3	<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	192.00
3.4	<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	322.00
3.5	<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	516.00
3.6	<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 @ Rs. 22.00 per cum but excluding the cost of watering, rolling & compaction.	cum	99.00
(ii)	Including Royalty @ Rs. 22.00 per cum, cost of watering, rolling & compaction.	cum	120.00
3.7	<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 @ Rs. 22.00 per cum but excluding the cost of watering, rolling & compaction.	cum	117.00
(ii)	Including Royalty @ Rs. 22.00 per cum and cost of watering, rolling & compaction.	cum	138.00
3.8	<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	477.00
<b>B</b>	<b>Manual Method</b>	cum	681.00



## Summary of Rate Analysis

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	558.00
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 @ Rs. 22.00 per cum but excluding the cost of watering, rolling & compaction.	cum	106.00
(ii)	Including Royalty @ Rs. 22.00 per cum and cost of watering, rolling & compaction.	cum	128.00
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	78.00
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	214.00
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	Manual Means (Depth upto 3 m)	cum	159.00
B	Mechanical Means (Depth upto 3 m)	cum	45.00
(ii)	<b>Ordinary rock (not requiring blasting)</b>		
A	Manual Means (Depth upto 3 m)	cum	198.00
B	Mechanical Means	cum	61.00
(iii)	<b>Hard rock ( requiring blasting )</b>		
A	Manual Means	cum	587.00
(iv)	<b>Hard rock ( blasting prohibited )</b>		
A	Mechanical Means	cum	589.00
(v)	<b>Marshy soil</b>		
A	Manual means ( upto 3 m depth)	cum	361.00
B	Mechanical Means	cum	131.00
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	19.20
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	5.80
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	229.00
(ii)	Rolling with smooth wheeled roller	cum	220.00
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	173.00
(ii)	Rolling with smooth wheeled roller	cum	164.00
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	264.00

## Summary of Rate Analysis

(ii)	Rolling with smooth wheeled roller	cum	253.00
<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	76.00
(ii)	Rolling with smooth wheeled roller	cum	65.00
<b>Case-II</b>	<b>Compacting original ground supporting embankment</b>		
(i)	Rolling with vibratory roller	cum	43.00
(ii)	Rolling with smooth wheeled roller	cum	32.00
<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	156.00
<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	115.00
<b>3.22</b>	<b>Turfing with Sodds</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	49.00
<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	184.00
<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	71.00
<b>B</b>	<b>Manual Means</b>	metre	40.00
<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	143.00
<b>B</b>	<b>Manual Means</b>	metre	59.00
<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	283.00
<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	93.00
<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	2127.00
<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	2.60
<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	87.00
<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	210.00
<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	303.00

### Summary of Rate Analysis

<b>3.34</b>	<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	489.00
<b>3.35</b>	<b>Work in Urban Roads</b> (The cost of earth work in urban roads inhabited area will be comparatively higher due to following reasons:)		-
<b>3.36</b>	<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	130.00

## Analysis of Rate

### CHAPTER - 3

### EARTH WORK, EROSION CONTROL AND DRAINAGE

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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.					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Labour					
		Mate	day	1.800	171.00	307.80	L-12
		Mazdoor	day	45.000	157.00	7065.00	L-13
		b) Machinery					
		Truck 5.5 cum capacity	hour	10.000	782.00	7820.00	P&M-057
		c) Overhead charges @ 0.1 on (a+b)				1519.28	
		d) Contractor's profit @ 0.1 on (a+b+c)				1671.21	
		Cost of 120 cum = a+b+c+d				18383.29	
		Rate per cum = (a+b+c+d)/120				153.19	
		<b>Royalty @ Rs. 22.00 per Cum</b>				22.00	
		Rate per cum			say	175.00	
	(ii)	Including Royalty @ Rs. 22.0 per cum and cost of watering, rolling & compaction				196.00	
		Rate per cum			say	196.00	
	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.				96.00	
		Rate per cum			say	96.00	
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 rolling , compaction & watering					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Labour					
		Mate	day	2.800	171.00	478.80	L-12
		Mazdoor	day	70.000	157.00	10990.00	L-13
		b) Machinery					
		Truck 5.5 cum capacity	hour	10.000	782.00	7820.00	P&M-057
		c) Overhead charges @ 0.1 on (a+b)				1928.88	
		d) Contractor's profit @ 0.1 on (a+b+c)				2121.77	
		Cost for 120 cum = a+b+c+d				23339.45	
		Rate per cum = (a+b+c+d)/120				194.50	
		<b>Royalty @ Rs. 22.00 per Cum</b>				22.00	
		Rate per cum			say	216.50	
					say	216.00	
	(ii)	Including royalty @ Rs. 22.00 per cum and watering , rolling & compaction.				238.00	
	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. including royalty @ Rs. 22.00 per cum				138.00	
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.					
		<i>Unit = cum</i>					
		<i>Taking output = 180 cum</i>					
		a) Labour					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		b) Machinery					
		Dozer, 80 HP @ 30 cum per hour	hour	6.000	4704.00	28224.00	P&M-014
		c) Overhead charges @ 0.1 on (a+b)				2855.17	
		d) Contractor's profit @ 0.1 on (a+b+c)				3140.68	
		Cost for 180 cum = a+b+c+d				34547.53	
		Rate per cum = (a+b+c+d)/180				191.93	
					say	<u>192.00</u>	
3.4	301	Excavation in Ordinary Rock with Dozer with lead upto 100 metres					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 108 cum</i>					
		a) Labour					
		Mate	day	0.120	171.00	20.52	L-12
		Mazdoor	day	3.000	157.00	471.00	L-13
		b) Machinery					
		Dozer, 80 HP @ 20 cum per hour	hour	6.000	4704.00	28224.00	P&M-014
		c) Overhead charges @ 0.1 on (a+b)				2871.55	
		d) Contractor's profit @ 0.1 on (a+b+c)				3158.71	
		Cost for 108 cum = a+b+c+d				34745.78	
		Rate per cum = (a+b+c+d)/108				321.72	
					say	<u>322.00</u>	
3.5	301	Excavation in Hard Rock (requiring blasting) with disposal upto 1000 metres					
		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					
		<i>Unit = cum</i>					
		<i>Taking Output = 180 cum</i>					
		a) Labour					
		Mate	day	0.220	171.00	37.62	L-12
		Mazdoor	day	3.000	157.00	471.00	L-13
		Driller	day	2.000	190.00	380.00	L-06
		Blaster	day	0.250	264.00	66.00	L-03
		b) Machinery					
		Dozer, 80 HP @ 30 cum per hour	hour	6.000	4704.00	28224.00	P&M-014
		Air compressor, 250 cfm with 2 jack hammer	hour	6.000	405.00	2430.00	P&M-001
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	hour	11.250	787.00	8853.75	P&M-048
		c) Materials					
		Gelatin 80 per cent	kg	63.000	643.63	40548.38	M-104
		Electric Detonators @ 1 detonator for 2 gelatin sticks of 125 gms each	each	252.000	6.00	1512.00	M-094 /100
		Credit for excavated rock found suitable for use @ 50 per cent quantity blasted	cum	90.000	-135.00	-12150.00	M-089
		d) Overhead charges @ 0.1 on (a+b+c)				7679.87	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				8447.86	
		Cost for 180 cum = a+b+c+d+e				92926.48	
		Rate per cum = (a+b+c+d+e)/180				516.26	
					say	<u>516.00</u>	
	Note	1. The quality and availability of rock shall be checked before affording credit.					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		2. In case some rock is issued to the contractor at site, the item of carriage shall be reduced/restricted to that extent.					
3.6	301	<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 (including royalty @ Rs. 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	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 0.9 cum bucket capacity @ 60 cum per hour	hour	6.000	1646.00	9876.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.000	787.00	12592.00	P&M-048
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				2279.57	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2507.52	
		Cost for 360 cum = a+b+c+d				27582.77	
		Rate per cum = (a+b+c+d)/360				76.62	
		<b>Royalty @ Rs. 22.00 per Cum</b>				22.00	
		Rate per cum				98.62	
					<b>say</b>	<b><u>99.00</u></b>	
3.7	301	<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 (including royalty @ Rs. 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	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 0.90 cum bucket capacity @ 36 cum per hour	hour	6.000	1646.00	9876.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	11.000	787.00	8657.00	P&M-048
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				1886.07	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2074.67	
		Cost for 240 cum = a+b+c+d				22821.42	
		Rate per cum = (a+b+c+d)/240				95.09	
		<b>Royalty @ Rs. 22.00 per Cum</b>				22.00	
		Rate per cum				117.09	
					<b>say</b>	<b><u>117.00</u></b>	
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.					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	A	<b>Mechanised</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 36 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.400	171.00	68.40	L-12
		Mazdoor for trimming slopes including manual loading in truck	day	10.000	157.00	1570.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator with rock breaker attachment @ 6 cum per hour	hour	6.000	1646.00	9876.00	P&M-026
		Tipper 5.5 cum capacity, 1 trip per hour.	hour	6.500	787.00	5115.50	P&M-048
		Credit for excavated rock found suitable for use @ 50 per cent of excavated quantity	cum	18.000	-135.00	-2430.00	M-089
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				1419.99	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1561.99	
		Cost for 36 cum = a+b+c+d				17181.88	
		<b>Rate per cum = (a+b+c+d)/36</b>				477.27	
					<i>say</i>	<u>477.00</u>	
	<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>Manual Method</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 16 cum</i>					
		<b>a) Labour</b>					
		Mate	day	1.640	171.00	280.44	L-12
		Mazdoor including loading in truck	day	16.000	157.00	2512.00	L-13
		Chiseller	day	24.000	200.00	4800.00	L-05
		Blacksmith	day	1.000	213.00	213.00	L-02a
		<b>b) Machinery</b>					
		Tipper 5.5 cum capacity, 1 trip per hour.	hour	2.900	787.00	2282.30	P&M-048
		Credit for excavated rock found suitable for use @ 50 per cent of excavated	cum	8.000	-135.00	-1080.00	M-089
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				900.77	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				990.85	
		Cost for 16 cum = a+b+c+d				10899.37	
		<b>Rate per cum = (a+b+c+d)/16</b>				681.21	
					<i>say</i>	<u>681.00</u>	
	<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>					
		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					
		<i>Unit = cum</i>					
		<i>Taking output = 180 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.220	171.00	37.62	L-12

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor	day	3.000	157.00	471.00	L-13
		Driller	day	2.000	190.00	380.00	L-06
		Blaster	day	0.500	264.00	132.00	L-03
		<b>b) Machinery</b>					
		Dozer 80 HP @ 30 cum per hour	hour	6.000	4704.00	28224.00	P&M-014
		Air compressor, 250 cfm with 2 jack hammers	hour	6.000	405.00	2430.00	P&M-001
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	8.200	787.00	6453.40	P&M-048
		<b>c) Materials</b>					
		Gelatin 80 per cent	kg	63.000	643.63	40548.38	M-104
		Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	each	1008.000	6.00	6048.00	M-094 /100
		Credit for excavated rock found suitable for use @ 50 per cent quantity blasted	cum	90.000	-135.00	-12150.00	M-089
		Add 5 per cent of cost of a+b+c towards muffling arrangements to guard against any rock fly off during blasting				3950.02	
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				8295.04	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				9124.55	
		Cost for 180 cum = a+b+c+d+e				100370.00	
		Rate per cum = (a+b+c+d+e)/180				557.61	
					say	<u>558.00</u>	
		<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>					
		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 @ Rs. 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	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		<b>b) Machinery</b>					
		Hydraulic excavator 0.90 cum bucket capacity @ 50 cum per hour	hour	6.000	1646.00	9876.00	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	13.640	787.00	10734.68	P&M-048
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				2093.84	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2303.22	
		Cost for 300 cum = a+b+c+d				25335.42	
		Rate per cum = (a+b+c+d)/300				84.45	
		<b>Royalty @ Rs. 22.00 per Cum</b>				22.00	
		Rate per cum				106.45	
					say	<u>106.00</u>	
3.11	301	<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.					
		<b>Unit = cum</b>					
		<b>Taking output = 360 cum</b>					



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		a) Labour						
		Mate	day	0.080	171.00	13.68	L-12	
		Mazdoor	day	2.000	157.00	314.00	L-13	
		b) Machinery						
		Excavator 0.90 cum bucket capacity @ 60 cum per hour	hour	6.000	1646.00	9876.00	P&M-026	
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.360	787.00	12875.32	P&M-048	
		c) Overhead charges @ 0.1 on (a+b)				2307.90		
		d) Contractor's profit @ 0.1 on (a+b+c)				2538.69		
		Cost for 360 cum = a+b+c+d				27925.59		
		Rate per cum = (a+b+c+d)/360				77.57		
						say	<u>78.00</u>	
		<b>Note</b>	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	<b>Presplitting 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						
		<i>Unit = sqm</i>						
		<i>Taking output = 400 sqm( 120 cum considering 300mm average depth of excavation over the existing rock face)</i>						
		a) Labour						
		Mate	day	0.600	171.00	102.60	L-12	
		Mazdoor	day	15.000	157.00	2355.00	L-13	
		b) Machinery						
		Air compressor 250 cfm with 2 leads @ 20 cum per hour	hour	6.000	405.00	2430.00	P&M-001	
		Dozer, 80 HP	hour	6.000	4704.00	28224.00	P&M-014	
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017	
		c) Materials						
		Gelatin 80 per cent	kg	42.000	643.63	27032.25	M-104	
		Electric Detonators @ 1 detonator for 1/2 gelatin stick of 125 gms each	each	672.000	6.00	4032.00	M-094 /100	
		d) Overhead charges @ 0.1 on (a+b+c)				7060.19		
		e) Contractor's profit @ 0.1 on (a+b+c+d)				7766.20		
		Cost for 400 sqm = a+b+c+d+e				85428.24		
		Rate per sqm = (a+b+c+d+e)/400				213.57		
						say	<u>214.00</u>	
		<b>Note</b>	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	<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) Ordinary soil						
		<i>Unit = cum</i>						
		<i>Taking output = 10 cum</i>						
		A Manual Means (Depth upto 3 m)						
		a) Labour						

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		Mate	day	0.320	171.00	54.72	L-12	
		Mazdoor	day	8.000	157.00	1256.00	L-13	
		b) Overhead charges @ 0.1 on (a)				131.07		
		c) Contractor's profit @ 0.1 on (a+b)				144.18		
		Cost for 10 cum = a+b+c				1585.97		
		Rate per cum = (a+b+c)/10				158.60		
					say	<u>159.00</u>		
		<b>Note</b>	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	171.00	54.72	L-12	
		Mazdoor	day	8.000	157.00	1256.00	L-13	
		b) Machinery						
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.000	1646.00	9876.00	P&M-026	
		c) Overhead charges @ 0.1 on (a+b)				1118.67		
		d) Contractor's profit @ 0.1 on (a+b+c)				1230.54		
		Cost for 300 cum = a+b+c+d				13535.93		
		Rate per cum = (a+b+c+d)/300				45.12		
					say	<u>45.00</u>		
		<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..					
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	171.00	68.40	L-12	
		Mazdoor	day	10.000	157.00	1570.00	L-13	
		b) Overhead charges @ 0.1 on (a)				163.84		
		c) Contractor's profit @ 0.1 on (a+b)				180.22		
		Cost for 10 cum = a+b+c				1982.46		
		Rate per cum = (a+b+c)/10				198.25		
					say	<u>198.00</u>		
		<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..					
3.13 (ii)	B	<b>Mechanical Means</b>						
		<i>Unit = cum</i>						
		<i>Taking output = 216 cum</i>						
		a) Labour						
		Mate	day	0.240	171.00	41.04	L-12	
		Mazdoor	day	6.000	157.00	942.00	L-13	
		b) Machinery						
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.000	1646.00	9876.00	P&M-026	
		c) Overhead charges @ 0.1 on (a+b)				1085.90		
		d) Contractor's profit @ 0.1 on (a+b+c)				1194.49		
		Cost for 216 cum = a+b+c+d				13139.44		
		Rate per cum = (a+b+c+d)/216				60.83		
					say	<u>61.00</u>		

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<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>					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		<b>a) Labour</b>					
		i) Mate	day	0.530	171.00	90.63	L-12
		ii) Driller	day	0.840	190.00	159.60	L-06
		iii) Blaster	day	0.400	264.00	105.60	L-03
		iv) Mazdoor	day	12.000	157.00	1884.00	L-13
		<b>b) Machinery</b>					
		Air Compressor 250 cfm with 2 jack hammer @ 15 cum per hour	hour	0.67	405.00	271.35	P&M-001
		<b>c) Material</b>					
		Blasting Material	kg	3.500	643.63	2252.69	M-104
		Detonator electric	each	14.000	6.00	84.00	M-094 /100
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				484.79	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				533.27	
		Cost for 10 cum = a+b+c+d+e				5865.92	
		Rate per cum = (a+b+c+d+e)/10				586.59	
					<i>say</i>	<u><i>587.00</i></u>	
		<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>					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
	<b>A</b>	<b>Mechanical Means</b>					
		<b>a) Labour</b>					
		Mate	day	0.200	171.00	34.20	L-12
		Mazdoor	day	5.000	157.00	785.00	L-13
		<b>b) Machinery</b>					
		Air Compressor 250 cfm with 2 leads of pneumatic breaker @ 1 cum per hour	hour	10.000	405.00	4050.00	P&M-001
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				486.92	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				535.61	
		Cost for 10 cum = a+b+c+d				5891.73	
		Rate per cum = (a+b+c+d)/10				589.17	
					<i>say</i>	<u><i>589.00</i></u>	
		<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	(v)	<b>Marshy soil</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
	<b>A</b>	<b>Manual means ( upto 3 m depth)</b>					
		<b>a) Labour</b>					
		Mate/Supervisor	day	0.400	171.00	68.40	L-12
		Mazdoor	day	10.000	157.00	1570.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley	hour	2.670	459.00	1225.53	P&M-053

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Material					
		Selected earth for refilling	cum	5.000	23.65	118.25	M-163
		d) Overhead charges @ 0.1 on (a+b+c)				298.22	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				328.04	
		Cost for 10 cum = a+b+c+d+e				3608.44	
		Rate per cum = (a+b+c+d+e)/ 10				360.84	
					say	<u>361.00</u>	
		<b>Note</b>					
		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	<b>Mechanical Means</b>					
		a) Labour					
		i) Mate	day	0.080	171.00	13.68	L-12
		ii) Mazdoor for dressing sides, bottom and backfilling	day	2.000	157.00	314.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.170	1646.00	279.82	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.450	787.00	354.15	P&M-048
		c) Material					
		Selected earth for refilling	cum	5.000	23.65	118.25	M-163
		d) Overhead charges @ 0.1 on (a+b+c)				107.99	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				118.79	
		Cost for 10 cum = a+b+c+d+e				1306.68	
		Rate per cum = (a+b+c+d+e)/10				130.67	
					say	<u>131.00</u>	
		<b>Note</b>					
		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	<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.					
		<b>Unit = sqm</b>					
		<b>Taking output = 100 sqm</b>					
		a) Labour					
		Mate	day	0.200	171.00	34.20	L-12
		Mazdoor including loading and unloading	day	5.000	157.00	785.00	L-13
		b) Machinery					
		Tractor-trolley	hour	1.670	459.00	766.53	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				158.57	
		d) Contractor's profit @ 0.1 on (a+b+c)				174.43	
		Cost for 100 sqm = a+b+c+d				1918.73	
		Rate per sqm = (a+b+c+d)/100				19.19	
					say	<u>19.20</u>	
		<b>Note</b>					
		In case material is to be reused at site, transportation cost catered above for disposal shall be deleted.					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.15	305.4.3	Scarifying Existing Bituminous Surface to a depth of 50 mm by Mechanical Means					
		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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 100 sqm</i>					
		a) Labour					
		Mate	day	0.010	171.00	1.71	L-12
		Mazdoor	day	0.250	157.00	39.25	L-13
		b) Machinery					
		Tractor with ripper attachment @ 60 cum per hour	hour	0.080	494.00	39.52	P&M-055
		Front end loader 1 cum bucket capacity @ 25 cum per hour	hour	0.200	1071.00	214.20	P&M-017
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.230	787.00	181.01	P&M-048
		c) Overhead charges @ 0.1 on (a+b)				47.57	
		d) Contractor's profit @ 0.1 on (a+b+c)				52.33	
		Cost for 100 sqm = a+b+c+d				575.58	
		Rate per sqm = (a+b+c+d)/100				5.76	
					<i>say</i>	<u>5.80</u>	
3.16	305	Construction of Embankment with Material obtained from Borrowpits					
		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>Unit = cum</i>					
		a) Labour					
		Mate	day	0.040	171.00	6.84	L-12
		Mazdoor	day	1.000	157.00	157.00	L-13
		b) Machinery					
		Hydraulic Excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1646.00	2748.82	P&M-026
		Tipper 10 tonne capacity	tonne.km	160 x L	6.85	1096.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				109.60	
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	4704.00	2352.00	P&M-014
		Motor grader for grading @ 100 cum per hour	hour	1.000	2435.00	2435.00	P&M-032
		Water tanker 6 KL capacity	hour	4.000	154.00	616.00	P&M-060
		Vibratory roller 8 -10 tonnes @ 100 cum per hour	hour	1.000	1614.00	1614.00	P&M-059
		c) Material					
		Cost of water	KL	24.000	225.00	5400.00	M-189
		Compensation & Royalty for earth taken from private land	cum	100.000	23.65	2365.00	M-092
		d) Overhead charges @ 0.1 on (a+b+c)				1890.03	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				2079.03	
		Cost for 100 cum = a+b+c+d+e				22869.31	
		Rate per cum = (a+b+c+d+e)/100				228.69	
					<i>say</i>	<u>229.00</u>	
		Note					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	Construction of Embankment with Material Deposited from Roadway Cutting					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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>Unit = cum</i>					
		<i>Taking output = 100 cum</i>					
		a) Labour					
		Mate	day	0.020	171.00	3.42	L-12
		Mazdoor	day	0.500	157.00	78.50	L-13
		b) Machinery					
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	4704.00	2352.00	P&M-014
		Motor grader for grading @ 100 cum per hour	hour	1.000	2435.00	2435.00	P&M-032
		Water tanker 6 KL capacity	hour	4.000	154.00	616.00	P&M-060
		Vibratory roller 8-10 tonnes @ 100 cum per hour	hour	1.000	1614.00	1614.00	P&M-059
		c) Material					
		Cost of water	KL	24.000	225.00	5400.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				1249.89	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1374.88	
		Rate for 100 cum = a+b+c+d+e				15123.69	
		Rate per cum = (a+b+c+d+e)/100				151.24	
		Royalty @ Rs. 22.00 per Cum				22.00	
					<i>say</i>	<u>173.00</u>	
		Note					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.
3.18	305	Construction of Subgrade and Earthen Shoulders					
		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					
		<i>Unit = cum</i>					
		<i>Taking output = 100 cum</i>					
		a) Labour					
		Mate	day	0.040	171.00	6.84	L-12
		Mazdoor	day	1.000	157.00	157.00	L-13
		b) Machinery					
		Hydraulic excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1646.00	2748.82	P&M-026
		Tipper 10 tonne capacity	tonne.km	175xL	6.85	1198.75	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				119.88	
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	4704.00	2352.00	P&M-014
		Motor grader for grading @ 50 cum per hour	hour	2.000	2435.00	4870.00	P&M-032
		Water tanker with 6 km lead	hour	4.000	154.00	616.00	P&M-060
		Vibratory roller 8-10 tonnes @ 80 cum per hour	hour	1.250	1614.00	2017.50	P&M-059
		c) Material					
		Cost of water	KL	24.000	225.00	5400.00	M-189
		Compensation & Royalty for earth taken from private land	cum	100.000	23.65	2365.00	M-092
		d) Overhead charges @ 0.1 on (a+b+c)				2185.18	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				2403.70	
		Cost for 100 cum = a+b+c+d+e				26440.66	
		Rate per cum = (a+b+c+d+e)/100				264.41	
					<i>say</i>	<u>264.00</u>	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.19	305.3.4	Compacting Original Ground					
	Case-I	Compacting original ground supporting sub-grade					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 600 cum</i>					
	a)	Labour					
		Mate	day	0.120	171.00	20.52	L-12
		Mazdoor	day	3.000	157.00	471.00	L-13
	b)	Machinery					
		Tractor with ripper attachment	hour	9.000	494.00	4446.00	P&M-055
		Motor grader for grading	hour	6.000	2435.00	14610.00	P&M-032
		Water tanker 6 KL capacity	hour	4.000	154.00	616.00	P&M-060
		Vibratory roller 8-10 tonne @ 80 cum/hour	hour	7.500	1614.00	12105.00	P&M-059
	c)	Material					
		Cost of water	KL	24.000	225.00	5400.00	M-189
	d)	Overhead charges @ 0.1 on (a+b+c)				3766.85	
	e)	Contractor's profit @ 0.1 on (a+b+c+d)				4143.54	
		Cost for 600 cum = a+b+c+d+e				45578.91	
		Rate per cum = (a+b+c+d+e)/600				75.96	
					<i>say</i>	<u>76.00</u>	
3.19	Case-II	Compacting original ground supporting embankment					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 600 cum</i>					
	a)	Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
	b)	Machinery					
		Tractor with ripper attachment	hour	6.000	494.00	2964.00	P&M-055
		Vibratory road roller 8-10 tonne capacity	hour	7.500	1614.00	12105.00	P&M-059
		Water tanker 6 KL capacity	hour	4.000	154.00	616.00	P&M-060
	c)	Material					
		Cost of water	KL	24.000	225.00	5400.00	M-189
	d)	Overhead charges @ 0.1 on (a+b+c)				2141.27	
	e)	Contractor's profit @ 0.1 on (a+b+c+d)				2355.39	
		Cost for 600 cum = (a+b+c+d+e)				25909.34	
		Rate per cum = (a+b+c+d+e)/600				43.18	
					<i>say</i>	<u>43.00</u>	
3.20	305	Stripping and Storing Top Soil					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
	a)	Labour					
		Mate	day	0.200	171.00	34.20	L-12
		Mazdoor	day	5.000	157.00	785.00	L-13

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Machinery					
		Dozer 80 HP @ 100 cum per hour	hour	0.100	4704.00	470.40	P&M-014
		c) Overhead charges @ 0.1 on (a+b)				128.96	
		d) Contractor's profit @ 0.1 on (a+b+c)				141.86	
		Cost for 10 cum = (a+b+c+d)				1560.42	
		Rate per cum = (a+b+c+d)/10				156.04	
					say	<u>156.00</u>	
3.21		Stripping, Storing and Re-laying Top Soil from Borrow Areas in Agriculture Fields.					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 300 cum</i>					
		a) Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		b) Machinery					
		Dozer, 80 HP	hour	6.000	4704.00	28224.00	P&M-014
		c) Overhead charges @ 0.1 on (a+b)				2855.17	
		d) Contractor's profit @ 0.1 on (a+b+c)				3140.68	
		Cost for 300 cum = (a+b+c+d)				34547.53	
		Rate per cum = (a+b+c+d)/300				115.16	
					say	<u>115.00</u>	
3.22	307	Turfing with Sods					
		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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 100 sqm</i>					
		a) Labour					
		Mate	day	0.120	171.00	20.52	L-12
		Mazdoor for preparation of ground and fetching of sods	day	3.000	157.00	471.00	L-13
		b) Machinery					
		Water tanker including watering for 3 months	hour	2.000	154.00	308.00	P&M-060
		Tractor-trolley	hour	1.000	459.00	459.00	P&M-053
		c) Material					
		Farm yard manure @ 0.18 cum per 100 sqm at site of work	cum	0.180	675.00	121.50	M-167
		Cost of water	KL	12.000	225.00	2700.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				408.00	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				448.80	
		Cost for 100 sqm = a+b+c+d+e				4936.82	
		Rate per 100 sqm = (a+b+c+d+e)/100				49.37	
					say	<u>49.00</u>	
3.23	308	Seeding and Mulching					
		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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 240 sqm</i>					



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.400	171.00	68.40	L-12
		Mazdoor	day	10.000	157.00	1570.00	L-13
		b) Machinery					
		Water tanker 6 KL capacity including watering for 3 months	hour	14.000	154.00	2156.00	P&M-060
		Tractor-trolley	hour	2.400	459.00	1101.60	P&M-053
		c) Material					
		Seeds	kg	3.600	30.00	108.00	M-162
		Sludge/Farm yard manure @ 0.18 cum per 100 sqm	cum	0.430	675.00	290.25	M-167
		Bitumen Emulsion	litre	55.200	43.116	2380.00	M-077
		Jute netting, open weave, 2.5 cm square opening	sqm	264.000	37.50	9900.00	M-121
		Cost of water for 3 months	KL	84.000	225.00	18900.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				3647.43	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				4012.17	
		Cost for 240 sqm = a+b+c+d+e				44133.85	
		Rate per sqm = (a+b+c+d+e)/240				183.89	
					say	<u>184.00</u>	
3.24	309	Surface Drains in Soil					
		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)					
		<i>Unit = metre</i>					
		<i>Taking output = 10 metres</i>					
		A Mechanical means					
		a) Labour					
		Mate	day	0.010	171.00	1.71	L-12
		Mazdoor for dressing of bed and side of drain	day	0.250	157.00	39.25	L-13
		b) Machinery					
		Hydraulic Excavator 0.3 cum bucket capacity @ 30 metres per hour	hour	0.330	1646.00	543.18	P&M-026
		c) Overhead charges @ 0.1 on (a+b)				58.41	
		d) Contractor's profit @ 0.1 on (a+b+c)				64.26	
		Cost for 10 metres = a+b+c+d				706.81	
		Rate per metre = (a+b+c+d)/10				70.68	
					say	<u>71.00</u>	
3.24		B Manual Means					
		a) Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		b) Overhead charges @ 0.1 on (a)				32.77	
		c) Contractor's profit @ 0.1 on (a+b)				36.04	
		Cost for 10 metres = a+b+c				396.49	
		Rate per metre = (a+b+c)/10				39.65	
					say	<u>40.00</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.					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<i>Unit = metre</i>					
		<i>Taking output = 10 metres</i>					
	A	<b>Mechanical Means</b>					
		a) Labour					
		Mate	day	0.020	171.00	3.42	L-12
		Mazdoor for dressing of bed and side of drain	day	0.500	157.00	78.50	L-13
		b) Machinery					
		Hydraulic Excavator 0.3 cum bucket capacity @ 15 metres per hour	hour	0.670	1646.00	1102.82	P&M-026
		c) Overhead charges @ 0.1 on (a+b)				118.47	
		d) Contractor's profit @ 0.1 on (a+b+c)				130.32	
		Cost for 10 metres = a+b+c+d				1433.54	
		Rate per metre = (a+b+c+d)/10				143.35	
						<i>say</i>	<u>143.00</u>
3.25		<b>Manual Means</b>					
		a) Labour					
		Mate	day	0.120	171.00	20.52	L-12
		Mazdoor	day	3.000	157.00	471.00	L-13
		b) Overhead charges @ 0.1 on (a)				49.15	
		c) Contractor's profit @ 0.1 on (a+b)				54.07	
		Cost for 10 metres = a+b+c				594.74	
		Rate per metre = (a+b+c)/10				59.47	
						<i>say</i>	<u>59.00</u>
3.26	309	<b>Surface Drains in Hard Rock</b>					
		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	<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.					
		<i>Unit = metre</i>					
		<i>Taking output = 10 metres</i>					
		a) Labour					
		Mate	day	0.040	171.00	6.84	L-12
		Mazdoor for excavation and back filling	day	2.000	157.00	314.00	L-13
		c) Material					
		Perforated pipe of cement concrete, internal dia 100 mm	metre	10.000	108.00	1080.00	M-135
		Crushed stone as per table 300-3	cum	2.400	391.93	940.63	M-012
		d) Overhead charges @ 0.1 on (a+b+c)				234.15	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				257.56	
		Cost for 10 metres = a+b+c+d+e				2833.18	
		Rate per metre = (a+b+c+d+e)/10				283.32	
						<i>say</i>	<u>283.00</u>
		<b>Note</b> 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.					
		<i>Unit = metre</i>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<i>Taking output = 10 metres</i>					
		a) Labour					
		Mate	day	0.020	171.00	3.42	L-12
		Mazdoor for excavation and back filling with aggregates	day	1.500	157.00	235.50	L-13
		b) Material					
		Crushed stone as per table 300-3	cum	1.350	391.93	529.11	M-012
		c) Overhead charges @ 0.1 on (a+b)				76.80	
		d) Contractor's profit @ 0.1 on (a+b+c)				84.48	
		Cost for 10 metres = a+b+c+d				929.31	
		Rate per metre = (a+b+c+d)/10				92.93	
					<i>say</i>	<u>93.00</u>	
3.29	309	Underground Drain at Edge of Pavement					
		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.					
		<i>Unit = Running metre</i>					
		<i>Taking output = one metre</i>					
		a) Earthwork in soil	cum	1.500	45.00	67.50	Item No. 3.13 B
		b) RCC work M-20	cum	0.495	4160.00	2059.20	Item 12.8 (C) RCC
		Rate per metre = (a+b)				2126.70	
		Rates for these items may be taken from chapters on earth work and substructures respectively.				<i>say</i>	<u>2127.00</u>
3.30	310	Preparation and Surface Treatment of Formation.					
		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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 3500sqm</i>					
		a) Labour					
		Mate	day	0.280	171.00	47.88	L-12
		Mazdoor	day	6.000	157.00	942.00	L-13
		Mazdoor skilled	day	1.000	200.00	200.00	L-15
		b) Machinery					
		Smooth 3 wheeled steel roller 8-10 tonnes	hour	3.000	604.00	1812.00	P&M-044
		Water tanker 6 KL, one trip per hour	hour	3.000	154.00	462.00	P&M-060
		c) Material					
		Cost of water	KL	18.000	225.00	4050.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				751.39	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				826.53	
		Cost for 3500 sqm = a+b+c+d+e				9091.79	
		Rate per sqm = (a+b+c+d+e)/3500				2.60	
						<i>say</i>	<u>2.60</u>
3.31	313	Construction of Rock fill Embankment					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 100 cum</i>					
		a) Labour					
		Mate	day	0.040	171.00	6.84	L-12

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		Mazdoor	day	1.500	157.00	235.50	L-13	
		<b>b) Machinery</b>						
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	4704.00	2352.00	P&M-014	
		Vibratory road roller 8-10 tonnes @ 100 cum per hour	hour	1.000	1614.00	1614.00	P&M-059	
		Water tanker 6 KL, one trip per hour	hour	2.000	154.00	308.00	P&M-060	
		<b>c) Material</b>						
		Cost of water	KL	12.000	225.00	2700.00	M-189	
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				721.63		
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				793.80		
		Cost for 100 cum = a+b+c+d+e				8731.77		
		Rate per cum = (a+b+c+d+e)/100				87.32		
					<i>say</i>	<u>87.00</u>		
		<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>						
3.32	301	<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.						
		<i>Unit = cum</i>						
		<i>Taking output = 260 cum</i>						
		<b>a) Labour</b>						
		Mate	day	0.240	171.00	41.04	L-12	
		Mazdoor for trimming slopes and helping in excavation etc.	day	6.000	157.00	942.00	L-13	
		<b>b) Machinery</b>						
		Dozer 80 HP (D-80 A 12)@ 43.28 cum per hour	hour	6.000	4704.00	28224.00	P&M-014	
		Front end loader	hour	6.000	1071.00	6426.00	P&M-017	
		Tipper 5.5cum capacity, 4 trips per hour.	hour	12.000	787.00	9444.00	P&M-048	
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				4507.70		
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				4958.47		
		Cost for 260 cum = a+b+c+d				54543.22		
		Rate per cum = (a+b+c+d)/260				209.78		
					<i>say</i>	<u>210.00</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.						
		<i>Unit = cum</i>						
		<i>Taking output = 170 cum</i>						
		<b>a) Labour</b>						
		Mate	day	0.320	171.00	54.72	L-12	
		Mazdoor	day	8.000	157.00	1256.00	L-13	
		<b>b) Machinery</b>						
		Dozer 80 HP (D-80 A 12)@ 28.32 cum per hour	hour	6.000	4704.00	28224.00	P&M-014	
		Front end loader	hour	7.000	1071.00	7497.00	P&M-017	
		Tipper 5.5cum capacity, 4 trips per hour.	hour	7.000	787.00	5509.00	P&M-048	
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				4254.07		

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Contractor's profit @ 0.1 on (a+b+c)				4679.48	
		Cost for 170 cum = a+b+c+d				51474.27	
		Rate per cum = (a+b+c+d)/170				302.79	
					<i>say</i>	<u>303.00</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.					
		<i>Unit = cum</i>					
		<i>Taking output = 170 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.490	171.00	83.79	L-12
		Mazdoor	day	10.000	157.00	1570.00	L-13
		Driller	day	2.000	190.00	380.00	L-06
		Blaster	day	0.250	264.00	66.00	L-03
		<b>b) Machinery</b>					
		Dozer 80 HP (D-80 A 12)@ 28.32 cum per hour	hour	6.000	4704.00	28224.00	P&M-014
		Air compressor 250 cfm with two jack hammer @ 20 cum per hour	hour	5.000	405.00	2025.00	P&M-001
		Front end loader	hour	7.000	1071.00	7497.00	P&M-017
		Tipper 5.5cum capacity, 4 trips per hour.	hour	7.000	787.00	5509.00	P&M-048
		<b>c) Materials</b>					
		Gelatine 80 per cent	kg	35.000	643.63	22526.88	M-104
		Electric Detonators @ 1 Detonator for 2 Gelatine sticks of 125 gms each	each	140.000	6.00	840.00	M-094 /100
		d) Overhead charges @ 0.1 on (a+b+c)				6872.17	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				7559.38	
		Cost for 170 cum = a+b+c+d+e				83153.21	
		Rate per cum = (a+b+c+d+e)/170				489.14	
					<i>say</i>	<u>489.00</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					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 360 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.160	171.00	27.36	L-12
		Mazdoor	day	4.000	157.00	628.00	L-13
		<b>b) Machinery</b>					
		Hydraulic Excavator 0.9 cum bucket capacity @ 60 cum/hour	hour	6.000	1646.00	9876.00	P&M-026
		Tipper 10T capacity fly ash 360 x 1.2 = 432 tonnes	tonne.km	432 x L	6.85	2959.20	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage for loading and unloading				295.92	
		Dozer 80 HP for spreading @ 200 cum/hour	hour	1.800	4704.00	8467.20	P&M-014
		Motor Grader for grading @ 100 cum/hour	hour	3.600	2435.00	8766.00	P&M-032
		Water tanker 6 KL capacity	hour	12.000	154.00	1848.00	P&M-060
		Vibratory Roller 8-10 tonne @ 100 cum/hour	hour	3.600	1614.00	5810.40	P&M-059
		c) Overhead charges @ 0.1 on (a+b)				3867.81	
		d) Contractor's profit @ 0.1 on (a+b+c)				4254.59	
		Cost for 360 cum = a+b+c+d				46800.48	
		<b>Rate per cum = (a+b+c+d)/360</b>				130.00	
					<i>say</i>	<u><b>130.00</b></u>	
	Note	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.					

## 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 Rs. 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.



## Summary of Rate Analysis

### CHAPTER-4

### SUB-BASES, BASES ( NON- BITUMINOUS) AND SHOULDERS

Item No.	Descriptions	Unit	Rate (in Rs.)
<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	958.00
(ii)	<b>for grading- II Material</b>	cum	922.00
(iii)	<b>for grading-III Material</b>	cum	831.00
<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	736.00
(ii)	<b>for grading- II Material</b>	cum	700.00
(iii)	<b>for grading-III Material</b>	cum	609.00
<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	754.00
(ii)	<b>for grading- II Material</b>	cum	752.00
(iii)	<b>for grading-III Material</b>	cum	741.00
<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	382.00
<b>B</b>	<b>By Manual Means</b>	cum	351.00
<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	453.00
<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	721.00
<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)	<b>For Sub-Base course</b>	cum	1349.00
(ii)	<b>For Base course</b>	cum	1172.00
<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	2.40
	<b>ii) 50 mm deep furrow cutting</b>	sqm	4.80
<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	305.00
	For Koilwar sand	cum	305.00

## Summary of Rate Analysis

4.9	<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 / <b>Smooth 3 wheeled Steel Roller</b> 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.)		
A	<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	899.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	891.00
(b)	<b>Using Screening Type-A (13.2mm Agg.) (with Vibratory Roller)</b>	cum	1013.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	1005.00
(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	942.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	934.00
(b)	<b>Using Screening Type-A (13.2mm Agg.) (with Vibratory Roller)</b>	cum	997.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	988.00
(c)	<b>Using Screening Type-B (11.2mm Agg.) (with Vibratory Roller)</b>	cum	1017.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	998.00
(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	984.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	976.00
(b)	<b>Using Screening Type-B (11.2mm Agg.) (with Vibratory Roller)</b>	cum	1048.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	1040.00
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	829.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	820.00
(b)	<b>Using Screening Type-A (13.2mm Agg.) (with Vibratory Roller)</b>	cum	942.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	934.00
(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	871.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	863.00
(b)	<b>Using Screening Type-A (13.2mm Agg.) (with Vibratory Roller)</b>	cum	926.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	918.00
(c)	<b>Using Screening Type-B (11.2mm Agg.) (with Vibratory Roller)</b>	cum	946.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	927.00
(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	914.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	906.00
(b)	<b>Using Screening Type-B (11.2mm Agg.) (with Vibratory Roller)</b>	cum	978.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	970.00
4.10	<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	240.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	232.00
4.11	<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	19.00

## Summary of Rate Analysis

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	941.00
	<b>With Smooth 3 wheeled Steel Roller</b>	cum	946.00
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	279.00
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	330.00
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	756.00
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)		
<b>A</b>	<b>By Mix in Place Method</b>		
(i)	<b>For 53 mm maximum size</b>	cum	724.00
(ii)	<b>For 45 mm maximum size</b>	cum	722.00
<b>B</b>	<b>By Mixing Plant :</b>		
(i)	<b>For 53 mm maximum size</b>	cum	919.00
(ii)	<b>For 45 mm maximum size</b>	cum	938.00
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	387.00

## Analysis of Rate

### CHAPTER - 4 SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
4.1	401		Granular Sub-Base with Close Graded Material (Table:-400-1)					
		A	Plant Mix Method					
			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>Unit = cum</i>					
			<i>Taking output = 225 cum (450 tonne)</i>					
			a) Labour					
			Mate	day	0.400	171.00	68.40	L-12
			Mazdoor skilled	day	2.000	200.00	400.00	L-15
			Mazdoor	day	8.000	157.00	1256.00	L-13
			b) Machinery					
			Wet mix plant @ 75 tonne capacity per hour	hour	6.000	2297.00	13782.00	P&M-094
			Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
			Water tanker 6 KL capacity 5 km lead with one tripper hour	hour	4.500	154.00	693.00	P&M-060
			Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
			Tipper 10 tonne	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
			Add 10 per cent of cost of carriage to cover loading and unloading				308.25	
			Motor Grader 110 HP	hour	6.000	2435.00	14610.00	P&M-032
			Vibratory roller 8-10 t	hour	6.000	1614.00	9684.00	P&M-059
			c) Material					
			Close graded Granular sub-base Material as per table 400-1					
			For Grading-I Material					
			53 mm to 9.5 mm @ 50 per cent	cum	144.000	494.46	71202.24	M-013
			9.5 mm to 2.36 mm @ 20 per cent	cum	57.000	394.31	22475.67	M-017
			2.36 mm below @ 30 per cent	cum	86.400	181.88	15714.43	M-020
			Cost of water	KL	27.000	225.00	6075.00	M-189
			OR					
			For Grading-II Material					
			26.5 mm to 9.5 mm @ 35 per cent	cum	100.800	529.62	53385.70	M-015
			9.5 mm to 2.36 mm @ 25 per cent	cum	72.000	394.31	28390.32	M-017
			2.36 mm below @ 40 per cent	cum	115.200	181.88	20952.58	M-020
			Cost of water	KL	27.000	225.00	6075.00	M-189
			OR					
			For Grading-III Material					
			9.5 mm to 4.75 mm @ 35 per cent	cum	100.800	508.74	51280.99	M-016
			4.75 mm to 2.36 mm @ 12.5 per cent	cum	36.000	195.72	7045.92	M-018
			2.36 mm below @ 52.5 per cent	cum	151.200	181.88	27500.26	M-020
			Cost of water	KL	27.000	225.00	6075.00	M-189
4.1A		(i)	Rate per cum for grading-I Material					
			d) Overhead charges @ 0.1 on (a+b+c)				17814.95	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				19596.44	
			Cost for 225 cum = a+b+c+d+e				215560.89	
			Rate per cum = (a+b+c+d+e)/225				958.05	
						<i>say</i>	<b>958.00</b>	
4.1A		(ii)	Rate per cum for grading-II Material					
			d) Overhead charges @ 0.1 on (a+b+c)				17148.57	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				18863.43	
			Cost for 225 cum = a+b+c+d+e				207497.75	
			Rate per cum = (a+b+c+d+e)/225				922.21	
						<i>say</i>	<b>922.00</b>	
4.1A		(iii)	Rate per cum for grading-III Material					
			d) Overhead charges @ 0.1 on (a+b+c)				15458.43	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				17004.27	
			Cost for 225 cum = a+b+c+d+e				187047.02	
			Rate per cum = (a+b+c+d+e)/225				831.32	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
					<i>say</i>	<u>831.00</u>		
		<b>Note</b>	Any one of the grading for material may be adopted as per design					
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						
		<i>Unit = cum</i>						
		<i>Taking output = 300 cum</i>						
		<b>a) Labour</b>						
		Mate	day	0.480	171.00	82.08	L-12	
		Mazdoor skilled	day	2.000	200.00	400.00	L-15	
		Mazdoor unskilled	day	10.000	157.00	1570.00	L-13	
		<b>b) Machinery</b>						
		Motor Grader 110 HP @ 50 cum	hour	6.000	2435.00	14610.00	P&M-032	
		Vibratory roller 8 -10 tonne	hour	6.000	1614.00	9684.00	P&M-059	
		Tractor - Rotavator	hour	12.000	480.00	5760.00	P&M-054	
		Water tanker 6 KL capacity	hour	3.000	154.00	462.00	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	494.46	94936.32	M-013	
		9.5 mm to 2.36 mm @ 20 per cent	cum	76.000	394.31	29967.56	M-017	
		2.36 mm below @ 30 per cent	cum	115.200	181.88	20952.58	M-020	
		Cost of water	KL	18.000	225.00	4050.00	M-189	
		OR						
		<b>For Grading-II Material</b>						
		26.5 mm to 9.5 mm @ 35 per cent	cum	134.400	529.62	71180.93	M-015	
		9.5 mm to 2.36 mm @ 25 per cent	cum	96.000	394.31	37853.76	M-017	
		2.36 mm below @ 40 per cent	cum	153.600	181.88	27936.77	M-020	
		Cost of water	KL	18.000	225.00	4050.00	M-189	
		OR						
		<b>For Grading-III Material</b>						
		9.5 mm to 4.75 mm @ 35 per cent	cum	134.400	508.74	68374.66	M-016	
		4.75 mm to 2.36 mm @ 12.5 per cent	cum	48.000	195.72	9394.56	M-018	
		2.36 mm below @ 52.5 per cent	cum	201.600	181.88	36667.01	M-020	
		Cost of water	KL	18.000	225.00	4050.00	M-189	
4.1B	(i)	<b>Rate per cum for grading-I Material</b>						
		d) Overhead charges @ 0.1 on (a+b+c)				18247.45		
		e) Contractor's profit @ 0.1 on (a+b+c+d)				20072.20		
		Cost for 300 cum = a+b+c+d+e					220794.19	
		Rate per cum = (a+b+c+d+e)/300					735.98	
					<i>say</i>	<u>736.00</u>		
4.1B	(ii)	<b>Rate per cum for grading-II Material</b>						
		d) Overhead charges @ 0.1 on (a+b+c)				17358.95		
		e) Contractor's profit @ 0.1 on (a+b+c+d)				19094.85		
		Cost for 300 cum = a+b+c+d+e					210043.34	
		Rate per cum = (a+b+c+d+e)/300					700.14	
					<i>say</i>	<u>700.00</u>		
4.1B	(iii)	<b>Rate per cum for grading-III Material</b>						
		d) Overhead charges @ 0.1 on (a+b+c)				15105.43		
		e) Contractor's profit @ 0.1 on (a+b+c+d)				16615.97		
		Cost for 300 cum = a+b+c+d+e					182775.71	
		Rate per cum = (a+b+c+d+e)/300					609.25	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
					<i>say</i>	<u>609.00</u>		
		Note	Any one of the grading for material may be adopted as per design					
4.2	401	Granular Sub-Base with Coarse Graded Material (Table:- 400- 2)						
		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>Unit = cum</i>						
		<i>Taking output = 300 cum</i>						
		<b>a) Labour</b>						
		Mate	day	0.400	171.00	68.40	L-12	
		Mazdoor skilled	day	2.000	200.00	400.00	L-15	
		Mazdoor	day	8.000	157.00	1256.00	L-13	
		<b>b) Machinery</b>						
		Mortar Grader 110 HP @ 50 cum per hour	hour	6.000	2435.00	14610.00	P&M-032	
		Vibratory roller 8 -10 tonne	hour	6.000	1614.00	9684.00	P&M-059	
		Water tanker 6 KL capacity	hour	3.000	154.00	462.00	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	441.36	59318.78	M-029	
		26.5 mm to 4.75 mm @ 45 per cent	cum	172.800	480.94	83106.43	M-026	
		2.36 mm below @ 20 per cent (Coarse Sand)	cum	76.800	181.88	13968.38	M-022	
		Cost of water	KL	18.000	225.00	4050.00	M-189	
		OR						
		<b>For Grading-II Material</b>						
		26.5 mm to 4.75 mm @ 75 per cent	cum	288.000	480.94	138510.72	M-026	
		2.36 mm below @ 25 per cent	cum	96.000	181.88	17460.48	M-022	
		Cost of water	KL	18.000	225.00	4050.00	M-189	
		OR						
		<b>For Grading-III Material</b>						
		9.5 mm to 4.75 mm @ 66 per cent	cum	255.000	508.74	129728.70	M-025	
		2.36 mm below @ 34 per cent	cum	129.000	181.88	23462.52	M-022	
		Cost of water	KL	18.000	225.00	4050.00	M-189	
4.2	(i)	<b>Rate per cum for grading-I Material</b>						
		d) Overhead charges @ 0.1 on (a+b+c)				18692.40		
		e) Contractor's profit @ 0.1 on (a+b+c+d)				20561.64		
		Cost for 300 cum = a+b+c+d+e					226178.04	
		Rate per cum = (a+b+c+d+e)/300					753.93	
					<i>say</i>	<u>754.00</u>		
4.2	(ii)	<b>Rate per cum for grading-II Material</b>						
		d) Overhead charges @ 0.1 on (a+b+c)				18650.16		
		e) Contractor's profit @ 0.1 on (a+b+c+d)				20515.18		
		Cost for 300 cum = a+b+c+d+e					225666.94	
		Rate per cum = (a+b+c+d+e)/300					752.22	
					<i>say</i>	<u>752.00</u>		
4.2	(iii)	<b>Rate per cum for grading-III Material</b>						
		d) Overhead charges @ 0.1 on (a+b+c)				18372.16		
		e) Contractor's profit @ 0.1 on (a+b+c+d)				20209.38		
		Cost for 300 cum = a+b+c+d+e					222303.16	
		Rate per cum = (a+b+c+d+e)/300					741.01	
					<i>say</i>	<u>741.00</u>		

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Note	Any one of the grading for material may be adopted as per design					
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					
			<i>Unit = cum</i>					
			<i>Taking output = 300 cum (525 tonne)</i>					
		A	<b>By Mechanical Means</b>					
			a) <b>Labour</b>					
			Mate	day	0.360	171.00	61.56	L-12
			Skilled mazdoor for alignment and geometrics	day	1.000	200.00	200.00	L-15
			Mazdoor for spraying lime	day	8.000	157.00	1256.00	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	494.00	5928.00	P&M-055
			Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2435.00	14610.00	P&M-032
			Vibratory roller 8 - 10 tonne capacity	hour	6.00x0.65*	1614.00	6294.60	P&M-059
			Water tanker 6 KL capacity	hour	12.000	154.00	1848.00	P&M-060
			c) <b>Material</b>					
			Lime at site	tonne	15.750	3069.00	48336.75	M-188
			Cost of water	KL	72.000	225.00	16200.00	M-189
			d) <b>Overhead charges @ 0.1 on (a+b+c)</b>				9473.49	
			e) <b>Contractor's profit @ 0.1 on (a+b+c+d)</b>				10420.84	
			Cost for 300 cum= a+b+c+d+e				114629.24	
			<b>Rate per cum =( a+b+c+d+e)/300</b>				382.10	
						<i>say</i>	<b><u>382.00</u></b>	
		Note	* 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>By Manual Means</b>					
			<i>Unit = cum</i>					
			<i>Taking output = 150 cum (263 tonnes)</i>					
			a) <b>Labour</b>					
			Mate	day	1.440	171.00	246.24	L-12
			Mazdoor skilled	day	1.000	200.00	200.00	L-15
			Mazdoor	day	35.000	157.00	5495.00	L-13
			b) <b>Machinery</b>					
			Vibratory roller 8 - 10 tonne @ 60 cum per hour	hour	2.500	1614.00	4035.00	P&M-059
			Water tanker 6 KL capacity	hour	6.000	154.00	924.00	P&M-060
			c) <b>Material</b>					
			Lime at site	tonne	8.000	3069.00	24552.00	M-188
			Cost of water	KL	36.000	225.00	8100.00	M-189
			d) <b>Overhead charges @ 0.1 on (a+b+c)</b>				4355.22	
			e) <b>Contractor's profit @ 0.1 on (a+b+c+d)</b>				4790.75	
			Cost for 150 cum= a+b+c+d+e				52698.21	
			<b>Rate per cum =( a+b+c+d+e)/150</b>				351.32	
						<i>say</i>	<b><u>351.00</u></b>	
4.4	402		<b>Lime Treated Soil for Sub- Base</b>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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.					
		<b>Unit = cum</b>					
		<b>Taking output = 300 cum (525 tonnes)</b>					
		<b>a) Labour</b>					
		Mate	day	0.480	171.00	82.08	L-12
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		Mazdoor	day	10.000	157.00	1570.00	L-13
		<b>b) Machinery</b>					
		Excavator 0.90 cum bucket capacity	hour	6.000	1646.00	9876.00	P&M-026
		Tipper for carriage of soil	tonne.km	525 x L	6.85	3596.25	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				359.63	
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2435.00	14610.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	1614.00	9684.00	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	480.00	5760.00	P&M-054
		Water tanker 6 KL capacity	hour	12.000	154.00	1848.00	P&M-060
		<b>c) Material</b>					
		Lime at site	tonne	15.750	3069.00	48336.75	M-188
		Cost of water	KL	72.000	225.00	16200.00	M-189
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				11232.27	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				12355.50	
		Cost for 300 cum = a+b+c+d+e				135910.47	
		<b>Rate per cum= (a+b+c+d+e)/300</b>				453.03	
					<b>say</b>	<b><u>453.00</u></b>	
4.5	403	<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	171.00	82.08	L-12
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		Mazdoor	day	10.000	157.00	1570.00	L-13
		<b>b) Machinery</b>					
		Excavator 0.90 cum bucket capacity	hour	6.000	1646.00	9876.00	P&M-026
		Tipper for carriage of soil	tonne.km	525 x L	6.85	3596.25	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				359.63	
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2435.00	14610.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	1614.00	9684.00	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	480.00	5760.00	P&M-054
		Water tanker 6 KL capacity	hour	12.000	154.00	1848.00	P&M-060
		<b>c) Material</b>					
		Cement at site (@ 4 per cent of 525 tonne)	tonne	21.000	5462.00	114702.00	M-081
		Cost of water	KL	72.000	225.00	16200.00	M-189
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				17868.80	



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Contractor's profit @ 0.1 on (a+b+c+d)				19655.68	
		Cost for 300 cum = a+b+c+d+e				216212.43	
		Rate per cum= (a+b+c+d+e)/300				720.71	
					<i>say</i>	<u>721.00</u>	
4.6	403	Cement Treated Crushed Rock or combination as per clause 403.2 and table 400.4 in Sub base/ Base					
		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>Unit = cum</i>					
		<i>Taking output = 300 cum (600 tonnes)</i>					
		Quantity of cement assumed as 4 per cent of quantity of crushed rock by weight.					
		a) Labour					
		Mate	day	0.480	171.00	82.08	L-12
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		Mazdoor	day	10.000	157.00	1570.00	L-13
		b) Machinery					
		Motor Grader 110 HP @ 50 cum per hour	hour	6.000	2435.00	14610.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	1614.00	9684.00	P&M-059
		Tractor with Rotavator and blade @ 25 cum per hour	hour	12.000	480.00	5760.00	P&M-054
		Water tanker 6 KL capacity	hour	10.000	154.00	1540.00	P&M-060
		c) Material					
		Cement at site @ 4 per cent by weight of crushed aggregate (600 tonne)	tonne	24.000	5462.00	131088.00	M-081
		Grading of material for sub-base course					
		37.5 mm to 9.5 mm @ 55 per cent	cum	211.200	471.86	99656.83	M-014
		9.5 mm to 4.75 mm @ 20 per cent	cum	76.800	508.74	39071.23	M-025
		4.75 mm to 75 micron @ 25 per cent	cum	96.000	181.88	17460.48	M-019
		Cost of water	KL	60.000	225.00	13500.00	M-189
		or					
		Grading of material for Base course					
		37.5 mm to 9.5 mm @ 32.5 per cent	cum	124.800	471.86	58888.13	M-028
		9.5 mm to 4.75 mm @ 5 per cent	cum	19.200	508.74	9767.81	M-025
		4.75 mm to 75 micron @ 62.5 per cent	cum	240.000	181.88	43651.20	M-023
		Cost of water	KL	60.000	225.00	13500.00	M-189
4.6	(i)	For Sub-Base course					
		d) Overhead charges @ 0.1 on (a+b+c)				33442.26	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				36786.49	
		Cost for 300 cum = a+b+c+d+e				404651.38	
		Rate per cum = (a+b+c+d+e)/300				1348.84	
					<i>say</i>	<u>1349.00</u>	
4.6	(ii)	For Base course					
		d) Overhead charges @ 0.1 on (a+b+c)				29054.12	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				31959.53	
		Cost for 300 cum = a+b+c+d+e				351554.87	
		Rate per cum = (a+b+c+d+e)/300				1171.85	
					<i>say</i>	<u>1172.00</u>	
		Note					Quantities of aggregates provided under 'c' above are uncompacted quantities.
4.7	404.3.1	Making 50 mm x 50 mm Furrows					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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					
		<i>Unit = sqm</i>					
		<i>Taking output = 30 m x 7 m = 210 sqm</i>					
	(i)	25mm deep furrow cutting					
		a) Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.200	459.00	91.80	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				41.95	
		d) Contractor's profit @ 0.1 on (a+b+c)				46.14	
		Cost for 210 sqm= a+b+c+d				507.57	
		Rate per sqm =(a+b+c+d)/210				2.42	
					say	<u>2.40</u>	
	(ii)	50mm deep furrow cutting					
		a) Labour					
		Mate	day	0.160	171.00	27.36	L-12
		Mazdoor	day	4.000	157.00	628.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.400	459.00	183.60	P&M-053
		c) Overhead charges @ 0.1 on (a+b)				83.90	
		d) Contractor's profit @ 0.1 on (a+b+c)				92.29	
		Cost for 210 sqm= a+b+c+d				1015.14	
		Rate per sqm =(a+b+c+d)/210				4.83	
					say	<u>4.80</u>	
4.8	404.3.2	Inverted Choke					
		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					
		<i>Unit = cum</i>					
		<i>Taking output = 600 cum</i>					
		a) Labour					
		Mate	day	0.920	171.00	157.32	L-12
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		Mazdoor	day	21.000	157.00	3297.00	L-13
		b) Machinery					
		Motor Grader 110 HP	hour	6.000	2435.00	14610.00	P&M-032
		Vibratory roller 8-10 tonnes @ 60 cum per hour	hour	6.000	1614.00	9684.00	P&M-059
		Water tanker 6 KL capacity	hour	18.000	154.00	2772.00	P&M-060
		c) Material					
		Screening type 'B' or coarse sand	cum	720.000	133.28	95961.60	M-004
		Cost of water	KL	108.000	225.00	24300.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				15118.19	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				16630.01	
		Cost for 600 cum = a+b+c+d+e				182930.12	
		Rate per cum = ( a+b+c+d+e)/600				304.88	
					say	<u>305.00</u>	
4.9	404	Water Bound Macadam					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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.					
	A	By Manual Means					
		<i>Unit = cum</i>					
		<i>Taking output = 360 cum</i>					
		a) Labour					
		Mate	day	10.080	171.00	1723.68	L-12
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		Mazdoor	day	250.000	157.00	39250.00	L-13
		b) Machinery					
		Vibratory roller 8 - 10 tonne @ 60cum per hour	hour	6.000	1614.00	9684.00	P&M-059
		or					
		Smooth 3 wheeled steel roller @ 30cum/hour	hour	12.000			
		Water tanker 6 KL capacity	hour	24.000	154.00	3696.00	P&M-060
		c) Material ( Refer table 400 - 7, 8 & 9 )					
4.9A	(i)	Grading-I					
		Aggregate					
		Grading-I 90 mm to 45 mm@ 1.21cum per 10 sqm for compacted thickness of 100 mm	cum	435.600	382.30	166529.88	M-039
		Stone Screening					
		Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	452.61	43993.69	M-042
		OR					
		Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	127.69	13790.52	M-007
		Binding material					
		Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	127.69	3677.47	M-007
		Cost of water	KL	144.000	225.00	32400.00	M-189
4.9A (i)	(a)	Using Scrining Crushable type such as Moorum or Gravel					
		d) Overhead charges @ 0.1 on (a+b+c)				26747.41	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				29422.15	
		Cost for 360 cum = a+b+c+d+e				323643.64	
		Rate per cum = (a+b+c+d+e)/360				899.01	
						<i>say</i>	<b><u>899.00</u></b>
		OR					
4.9A (i)	(b)	Using Scrining Type-A (13.2mm agg.) with binding material					
		d) Overhead charges @ 0.1 on (a+b+c)				30135.47	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				33149.02	
		Cost for 360 cum = a+b+c+d+e				364639.22	
		Rate per cum = (a+b+c+d+e)/360				1012.89	
						<i>say</i>	<b><u>1013.00</u></b>
4.9A	(ii)	Grading-II					
		Aggregate					
		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	412.26	179580.46	M-038 / M-036
		Stone Screening					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Type A 13.2 mm for grading-II @ 0.12 cum per 10 sqm	cum	57.600	452.61	26070.34	M-042
		OR					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	127.69	13482.79	M-007
		OR					
		Type B11.2 mm for grading-III @ 0.20 cum per 10 sqm	cum	96.010	333.95	32062.54	M-041
		Binding material					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	127.69	3677.47	M-007
		Cost of water	KL	144.000	225.00	32400.00	M-189
4.9A (ii)	(a)	<b>Using Screening Crushable type such as Moorum or Gravel</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				28021.69	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				30823.86	
		Cost for 360 cum = a+b+c+d+e				339062.48	
		Rate per cum = (a+b+c+d+e)/360				941.84	
						say	<u>942.00</u>
		OR					
4.9A (ii)	(b)	<b>Using Scriming Type-A (13.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				29648.19	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				32613.01	
		Cost for 360 cum = a+b+c+d+e				358743.15	
		Rate per cum = (a+b+c+d+e)/360				996.51	
						say	<u>997.00</u>
4.9A (ii)	(c)	<b>Using Scriming Type-B (11.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				30247.41	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				33272.16	
		Cost for 360 cum = a+b+c+d+e				365993.72	
		Rate per cum = (a+b+c+d+e)/360				1016.65	
						say	<u>1017.00</u>
4.9A	(iii)	<b>Grading-III</b>					
		Aggregate					
		Grading-III 53 mm to 22.4 mm@ 0.91 cum per 10 sqm for compacted thickness of 75 mm	cum	435.600	441.36	192256.42	M-036
		Stone Screening					
		Type B 11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	333.95	28853.28	M-041
		OR					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	127.69	13482.79	M-007
		Binding material					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	127.69	3677.47	M-007
		Cost of water	KL	144.000	225.00	32400.00	M-189
4.9A (iii)	(a)	<b>Using Scriming Crushable type such as Moorum or Gravel</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				29289.29	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				32218.22	
		Cost for 360 cum = a+b+c+d+e				354400.39	
		Rate per cum = (a+b+c+d+e)/360				984.45	
						say	<u>984.00</u>
		OR					
4.9A (iii)	(b)	<b>Using Scriming Type-B (11.2mm agg.)</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				31194.08	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				34313.49	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 360 cum = a+b+c+d+e				377448.43	
		Rate per cum = (a+b+c+d+e)/360				1048.47	
					<i>say</i>	<u>1048.00</u>	
		( Anyone of the aggregate grading, screening and binding material may be used as per design)					
4.9	B	<b>By Mechanical Means:</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 360 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.680	171.00	116.28	L-12
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		Mazdoor	day	15.000	157.00	2355.00	L-13
		<b>b) Machinery</b>					
		Motor grader 110 HP @ 50cum/hr. for spreading	hour	7.200	2435.00	17532.00	P&M-032
		Vibratory roller 8-10 tonnes @ 60cum/hr.	hour	6.000	1614.00	9684.00	P&M-059
		or					
		Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000			
		Water tanker 6 KL capacity	hour	24.000	154.00	3696.00	P&M-060
		<b>c) Material ( Refer table 400 - 7, 8 &amp; 9 )</b>					
4.9B	(i)	<b>Grading-I</b>					
		Aggregate					
		Grading-I 90 mm to 45 mm@ 1.21cum per 10 sqm for compacted thickness of 100 mm	cum	435.600	382.30	166529.88	M-039
		Stone Screening					
		Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	452.61	43993.69	M-042
		OR					
		Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	127.69	13790.52	M-007
		Binding material					
		Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	127.69	3677.47	M-007
		Cost of water	KL	144.000	225.00	32400.00	M-189
4.9B (i)	(a)	<b>Using Scrining Crushable type such as Moorum or Gravel</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				24650.37	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				27115.40	
		Cost for 360 cum = a+b+c+d+e				298269.45	
		Rate per cum = (a+b+c+d+e)/360				828.53	
					<i>say</i>	<u>829.00</u>	
		OR					
4.9B (i)	(b)	<b>Using Scrining Type-A (13.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				28038.43	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				30842.28	
		Cost for 360 cum = a+b+c+d+e				339265.03	
		Rate per cum = (a+b+c+d+e)/360				942.40	
					<i>say</i>	<u>942.00</u>	
4.9B	(ii)	<b>Grading-II</b>					
		Aggregate					
		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	412.26	179580.46	M-038 / M-036
		Stone Screening					
		Type A 13.2 mm for grading-II@ 0.12 cum per 10 sqm	cum	57.600	452.61	26070.34	M-042
		OR					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	127.69	13482.79	M-007
		OR					
		Type B 11.2 mm for grading-III @ 0.20 cum per 10 sqm	cum	96.010	333.95	32062.54	M-041
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	127.69	3677.47	M-007
		Cost of water	KL	144.000	225.00	32400.00	M-189
4.9B (ii)	(a)	<b>Using Scrining Crushable type such as Moorum or Gravel</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				25924.65	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				28517.12	
		Cost for 360 cum = a+b+c+d+e				313688.29	
		Rate per cum = (a+b+c+d+e)/360				871.36	
					say	<u>871.00</u>	
		OR					
4.9B (ii)	(b)	<b>Using Scrining Type-A (13.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				27551.15	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				30306.27	
		Cost for 360 cum = a+b+c+d+e				333368.97	
		Rate per cum = (a+b+c+d+e)/360				926.02	
					say	<u>926.00</u>	
4.9B (ii)	(c)	<b>Using Scrining Type-B (11.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				28150.37	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				30965.41	
		Cost for 360 cum = a+b+c+d+e				340619.53	
		Rate per cum = (a+b+c+d+e)/360				946.17	
					say	<u>946.00</u>	
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	441.36	192256.42	M-036
		<b>Stone Screening</b>					
		Type B 11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	333.95	28853.28	M-041
		OR					
		Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	127.69	13482.79	M-007
		<b>Binding material</b>					
		Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	127.69	3677.47	M-007
		Cost of water	KL	144.000	225.00	32400.00	M-189
4.9B (iii)	(a)	<b>Using Scrining Crushable type such as Moorum or Gravel</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				27192.25	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				29911.47	
		Cost for 360 cum = a+b+c+d+e				329026.20	
		Rate per cum = (a+b+c+d+e)/360				913.96	
					say	<u>914.00</u>	
		OR					
4.9B (iii)	(b)	<b>Using Scrining Type-B (11.2mm agg.) with binding material</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				29097.04	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				32006.75	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 360 cum = a+b+c+d+e				352074.24	
		Rate per cum = (a+b+c+d+e)/360				977.98	
					say	<u>978.00</u>	
		<b>Note</b> 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>					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output =360 cum</i>					
		<b>a) Labour</b>					
		Mate	day	4.160	171.00	711.36	L-12
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		Mazdoor for crushing broken cement concrete pavement/slabs into aggregate	day	102.000	157.00	16014.00	L-13
		<b>b) Machinery</b>					
		Motor Grader,110 HP @ 50 cum/hr.	hour	6.000	2435.00	14610.00	P&M-032
		Vibratory roller 8 - 10 tonne@ 60 cum per hour	hour	6.000	1614.00	9684.00	P&M-059
		or					
		Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000	604.00		P&M-044
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	720 x L	6.85	4932.00	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				493.20	
		Water tanker 6 KL capacity with 5 km lead @ 1 trip per hour	hour	12.000	154.00	1848.00	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	225.00	16200.00	M-189
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				7131.86	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				7845.04	
		Cost for 360 cum = a+b+c+d+e				86295.46	
		Rate per cum = (a+b+c+d+e)/360				239.71	
					say	<u>240.00</u>	
		<b>With Vibratory Roller</b>				<u>240.00</u>	
		<b>With Smooth 3 wheeled Steel Roller</b>				<u>232.00</u>	
		<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>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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					
		<i>Unit = sqm</i>					
		<i>Taking output = 7500 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	0.560	171.00	95.76	L-12
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		Mazdoor	day	12.000	157.00	1884.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom hydraulic @ 1250 sqm per hour	hour	6.000	422.00	2532.00	P&M-031
		Hydraulic self propelled chips spreader	hour	6.000	3332.00	19992.00	P&M-025
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	hour	6.000	787.00	4722.00	P&M-048
		Vibratory roller 8 -10 tonnes @ 30 cum per hour	hour	6.00x0.65*	1614.00	6294.60	P&M-059
		Bitumen pressure distributor @ 1750 sqm per hour	hour	4.280	1356.00	5803.68	P&M-004
		<b>c) Material</b>					
		Crushed stone aggregate 11.2 mm size	cum	97.500	589.97	57522.08	M-051
		Bitumen (60-70 grade)	tonne	0.250	48460.30	12115.08	M-074
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				11778.72	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				12956.59	
		Cost for 7500 sqm = a+b+c+d+e				142522.50	
		<b>Rate per sqm = (a+b+c+d+e)/7500</b>				19.00	
					<i>say</i>	<u>19.00</u>	
		<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.					
4.12	406	<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.					
		<i>Unit = cum</i>					
		<i>Taking output = 225 cum (495 tonnes)</i>					
		<b>a) Labour</b>					
		Mate	day	0.480	171.00	82.08	L-12
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		Mazdoor	day	10.000	157.00	1570.00	L-13
		<b>b) Machinery</b>					
		Wet mix plant of 75 tonne hourly capacity	hour	6.600	2297.00	15160.20	P&M-094
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1071.00	6426.00	P&M-017
		Paver finisher	hour	6.000	1123.00	6738.00	P&M-035
		Vibratory roller 8 - 10 tonne	hour	6x0.65	1614.00	6294.60	P&M-059
		or					
		Smooth 3 wheeled steel roller @ 8-10 tonnes.	hour	12.000	604.00		P&M-044
		Water tanker 6 KL capacity	hour	3.000	154.00	462.00	P&M-060
		Tipper	tonne.km	495 x L	6.85	3390.75	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				339.08	
		<b>c) Material ( Table 400-11)</b>					



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		45 mm to 22.4 mm@ 30 per cent	cum	89.100	461.26	41098.27	M-034
		22.4 mm to 2.36 mm @ 40 per cent	cum	118.800	507.98	60348.02	M-031
		2.36 mm to 75 micron@ 30 per cent	cum	89.100	181.88	16205.51	M-022
		Cost of water	KL	18.000	225.00	4050.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				17493.65	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				19243.02	
		Cost for 225 cum = a+b+c+d+e				211673.17	
		Rate per cum = (a+b+c+d+e)/225				940.77	
		<b>With Vibratory Roller</b>			<i>say</i>	<u>941.00</u>	
		<b>With Smooth 3 wheeled Steel Roller</b>				<u>946.00</u>	
		<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					
		<i>Unit = cum</i>					
		<i>Taking output =21 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.240	171.00	41.04	L-12
		Mazdoor	day	6.000	157.00	942.00	L-13
		<b>b) Machinery</b>					
		Water tanker 6 KL with 5 km lead and 1 trip per hour	hour	1.000	154.00	154.00	P&M-060
		Plate compactor @ 3.5 cum per hour	hour	6.000	392.00	2352.00	P&M-086
		<b>c) Material</b>					
		Cost of water	KL	6.000	225.00	1350.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				483.90	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				532.29	
		Cost for 21 cum = a+b+c+d+e				5855.24	
		Rate per cum = (a+b+c+d+e)/21				278.82	
					<i>say</i>	<u>279.00</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 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					
		<i>Unit = cum</i>					
		<i>Taking output = 21 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.160	171.00	27.36	L-12
		Mazdoor	day	4.000	157.00	628.00	L-13
		<b>b) Machinery</b>					
		Water tanker with 5 km lead	hour	1.000	154.00	154.00	P&M-060

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Plate Compactor @ 3.5 cum per hour	hour	6.000	392.00	2352.00	P&M-086
		Hydraulic Excavator 1.0 cum bucket capacity @60 cum per hour	hour	0.500	1646.00	823.00	P&M-026
		Tipper 10 tonne capacity	tonne.km	52.5 x L	6.85	359.63	Lead =1 km & P&M-047
		Add 10 per cent of cost of transportation to cover cost of loading and unloading				35.96	
		c) Material					
		Cost of water	KL	6.000	225.00	1350.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				572.99	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				630.29	
		Cost for 21 cum = a+b+c+d+e				6933.24	
		Rate per cum = (a+b+c+d+e)/ 21				330.15	
					<i>say</i>	<u>330.00</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..					
		<i>Unit = sqm</i>					
		<i>Taking output = 300 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	1.360	171.00	232.56	L-12
		Mason	day	4.000	213.00	852.00	L-11
		Mazdoor	day	30.000	157.00	4710.00	L-13
		<b>b) Machinery</b>					
		Vibratory road roller 8 -10 tonnes @60 cum per hour	hour	0.750	1614.00	1210.50	P&M-059
		Water tanker 6 KL capacity @ 1 trip per hour	hour	2.000	154.00	308.00	P&M-060
		Concrete mixer 0.4/0.28 cum per hour	hour	6.000	58.00	348.00	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	441.36	9175.87	M-029
		26.5 mm to 4.75 mm @ 45 per cent	cum	26.730	480.94	12855.53	M-026
		2.36 mm below @ 20 per cent	cum	11.880	181.88	2160.73	M-022
		<b>ii) For cement concrete grade M15 7.5 cum</b>					
		Aggregate 12 mm crushed @ 0.9 cum of concrete	cum	6.750	617.12	4165.56	M-052
		Sand @ 0.45 cum/cum of concrete	cum	3.380	133.28	450.49	M-005
		Cement	tonne	1.880	5462.00	10268.56	M-081
		<b>iii) For cement plaster 1:3</b>					
		Sand	cum	3.840	133.28	511.80	M-005
		Cement	tonne	1.830	5462.00	9995.46	M-081

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		iv) Pre-cast cement concrete tiles					
		Tiles size 300 x 300 mm and 25 mm thick	each	3300.000	37.50	123750.00	M-184
		v) RCC pipes					
		Pipes 200 mm dia, 2.5 m long for drainage	metre	22.500	165.00	3712.50	M-137
		vi) Cost of water	KL	12.000	225.00	2700.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				18740.76	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				20614.83	
		Cost for 300 sqm = a+b+c+d+e				226763.14	
		Rate per sqm = (a+b+c+d+e)/300				755.88	
					<i>say</i>	<u>756.00</u>	
4.17	410	Crusher Run Macadam Base					
		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					
		<i>Unit = cum</i>					
		<i>Taking output = 360 cum</i>					
	A	By Mix in Place Method					
		a) Labour					
		Mate	day	0.480	171.00	82.08	L-12
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		Mazdoor	day	10.000	157.00	1570.00	L-13
		b) Machinery					
		Tractor attached with rotavator @ 25 cum per hour	hour	12.000	480.00	5760.00	P&M-054
		Motor grader 110 HP	hour	6.000	2435.00	14610.00	P&M-032
		Vibratory roller 8 -10 tonnes @ 60 cum per hour	hour	6.000	1614.00	9684.00	P&M-059
		Water tanker 6 KL capacity	hour	6.000	154.00	924.00	P&M-060
		c) Material					
		Aggregate at site					
		i) For 53 mm maximum size					
		63 mm to 45 mm @ 33 per cent	cum	157.460	412.26	64914.46	M-038
		22.5 mm to 5.6 mm @ 32 per cent	cum	151.060	507.98	76735.46	M-032
		Below 5.6 mm @ 35 per cent	cum	166.680	195.72	32622.61	M-030
		Cost of water	KL	36.000	225.00	8100.00	M-189
		Or					
		ii) For 45 mm maximum size					
		45 mm to 22.5 mm @ 5 per cent	cum	24.120	461.26	11125.59	M-034
		22.4 mm to 5.6 mm @ 50 per cent	cum	237.600	507.98	120696.05	M-032
		Below 5.6 mm @ 45 per cent	cum	213.480	195.72	41782.31	M-030
		Cost of water	KL	36.000	225.00	8100.00	M-189
4.17A	(i)	For 53 mm maximum size					
		d) Overhead charges @ 0.1 on (a+b+c)				21540.26	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				23694.29	
		Cost for 360.0 cum = a+b+c+d+e				260637.16	
		Rate per cum = (a+b+c+d+e)/360				723.99	
		or			<i>say</i>	<u>724.00</u>	
4.17A	(ii)	For 45 mm maximum size					
		d) Overhead charges @ 0.1 on (a+b+c)				21473.40	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				23620.74	
		Cost for 360.0 cum = a+b+c+d+e				259828.17	
		Rate per cum = (a+b+c+d+e)/360				721.74	
					<i>say</i>	<u>722.00</u>	
	Note	Any one of the aggregate grading may be adopted					
4.17	B	By Mixing Plant :					
		<i>Unit = cum</i>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<i>Taking output = 225 cum (450 tonnes)</i>					
		<b>a) Labour</b>					
		Mate	day	0.280	171.00	47.88	L-12
		Mazdoor skilled	day	1.000	200.00	200.00	L-15
		Mazdoor	day	6.000	157.00	942.00	L-13
		<b>b) Machinery</b>					
		Wet mix plant @ 75 tonne per hour	hour	6.000	2297.00	13782.00	P&M-093
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Motor grader 110 HP	hour	6.000	2435.00	14610.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	1614.00	9684.00	P&M-059
		Water tanker 6 KL capacity	hour	3.000	154.00	462.00	P&M-060
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		<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	412.26	40566.38	M-038
		22.5 mm to 5.6 mm@ 32 per cent	cum	94.410	507.98	47958.39	M-032
		Below 5.6 mm @ 35 per cent	cum	104.180	195.72	20390.11	M-030
		Or					
		<b>ii) For 45 mm maximum size</b>					
		45 mm to 22.5 mm@ 5 per cent	cum	15.060	461.26	6946.58	M-034
		22.4 mm to 5.6 mm@ 50 per cent	cum	148.500	507.98	75435.03	M-032
		Below 5.6 mm@ 45 per cent	cum	133.430	195.72	26114.92	M-030
		Cost of water	KL	18.000	225.00	4050.00	M-189
4.17 B	(i)	<b>For 53 mm maximum size</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				17083.15	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				18791.47	
		Cost for 225 cum = a+b+c+d+e				206706.13	
		Rate per cum = (a+b+c+d+e)/225				918.69	
					<i>say</i>	<u>919.00</u>	
4.17 B	(ii)	<b>For 45 mm maximum size</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				17446.32	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				19190.95	
		Cost for 225 cum = a+b+c+d+e				211100.42	
		Rate per cum = (a+b+c+d+e)/225				938.22	
					<i>say</i>	<u>938.00</u>	
4.18	Suggestive	Lime, Flyash Stabilised Soil Sub-Base					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 480 cum (720 tonnes, density 1.50 t/cum)</i>					
		<b>Assumptions made</b>					
		Total mass taken for analysis = 720 t					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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	171.00	41.04	L-12
		Mazdoor	day	6.000	157.00	942.00	L-13
		Mazdoor (Skilled)	day	1.000	200.00	200.00	L-15
		<b>b) Machinery</b>					
		Hydraulic Excavator 0.90 cum bucket capacity @ 60cum/hr. for 360 cum soil	hour	6.000	1646.00	9876.00	P&M-026
		Tipper 10T capacity for carriage of soil 576 tonnes	tonne.km	578 x L	6.85	3959.30	Lead =1 km & P&M-047
		Tipper 10T capacity for carriage of 115 tonnes Flyash	tonne.km	115 x L	6.85	787.75	Lead =1 km & P&M-047
		Tipper 10T capacity for carriage of 29 tonnes of lime from store to work site	hour	3.000	787.00	2361.00	P&M-048
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				236.10	
		Tractor with disc harrows for pulverisation	hour	6.000	459.00	2754.00	P&M-053
		Motor Grader 110 HP @ 50 cum per hour for mixing in-place and grading	hour	9.600	2435.00	23376.00	P&M-032
		Vibratory roller 8 - 10 tonne	hour	6.000	1614.00	9684.00	P&M-059
		Water tanker 6 KL capacity	hour	12.000	154.00	1848.00	P&M-060
		<b>c) Material</b>					
		Unslaked Lime	tonne	29.000	3069.00	89001.00	M-188
		Compensation for earth taken from private source	cum	360.000	23.65	8514.00	M-092
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				15358.02	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				16893.82	
		Cost for 480 cum = a+b+c+d+e				185832.03	
		<b>Rate per cum= (a+b+c+d+e)/480</b>				387.15	
					<i>say</i>	<u>387.00</u>	
		<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.					

## Chapter – 5

### Bases and Surface Course (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 mention 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 have 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.

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.

## Summary of Rate Analysis

### CHAPTER-5 BASES AND SURFACE COURSES (BITUMINOUS)

Item No.	Descriptions	Unit	Rate (in Rs.)
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	33.70
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	12.00
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	6527.00
(ii)	<b>for GradingII(19 mm nominal size)</b>	cum	6506.00
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	348.00
B	<b>75 mm thick</b>	sqm	467.00
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	259.00
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	8062.00
(ii)	<b>for GradingII(19 mm nominal size)</b>	cum	8127.00
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	8458.00
(ii)	<b>for GradingII(10 mm nominal size)</b>	cum	9087.00
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	9352.00
(ii)	<b>for Grading-II(10 mm nominal size)</b>	cum	9325.00
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	87.00
Case - II	<b>13 mm nominal size chipping</b>	sqm	74.00



## Summary of Rate Analysis

5.10	<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	133.00
(ii)	<b>Case - II: Open-Graded Premix Surfacing using cationic Bitumen Emulsion</b>	sqm	142.00
5.11	<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	167.00
	<b>i) For Type B</b>	sqm	154.00
5.12	<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	67.00
(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	54.00
5.13	<b>Supply of Stone Aggregates for Pavement Courses</b> (Supply of stone aggregates from approved sources confirming 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	
5.14	<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 pre-coated 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	564.00
5.15	<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	68.00
(ii)	<b>3 mm thickness</b>	sqm	48.00
(iii)	<b>1.5 mm thickness</b>	sqm	29.60
5.16	<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	7159.00
5.17	<b>Fog Spray</b>	sqm	41.00
added	<b>1. In case it is decided by the engineer to blind the fog spray, the following may be added</b>	sqm	4.60
5.18	<b>Bituminous Cold Mix</b> ( Including Gravel Emulsion) (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	10362.00
(ii)	<b>Using bitumen emulsion and 19 mm or 26.5 mm nominal size aggregate</b>	cum	10298.00
(iii)	<b>Using cutback bitumen and 9.5 mm or 13.2 mm nominal size aggregate</b>	cum	7665.00
(iv)	<b>Using cutback bitumen and 19 mm or 26.5 mm nominal size aggregate</b>	cum	7583.00

## Summary of Rate Analysis

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	8087.00
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	62.00
(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	76.00
(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	101.00
(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	171.00
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	6320.00
(ii)	<b>40 mm thickness</b>	cum	9483.00
(iii)	<b>25 mm thickness</b>	cum	10784.00

## Analysis of Rate

### CHAPTER - 5 BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.1	502	Prime Coat					
		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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 3500 sqm</i>					
		a) Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	2.800	422.00	1181.60	P&M-031
		Air compressor 250 cfm	hour	2.800	405.00	1134.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	2.000	1356.00	2712.00	P&M-004
		Water tanker 6 KL capacity @ 1 tripper hour	hour	1.000	154.00	154.00	P&M-060
		c) Material					
		Bitumen emulsion @ 0.6 kg per sqm	tonne	2.100	43116.00	90543.60	M-077
		Cost of water	KL	6.000	225.00	1350.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				9740.29	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				10714.32	
		Cost for 3500 sqm = a+b+c+d+e				117857.48	
		Rate per sqm = (a+b+c+d+e)/3500				33.67	
					<i>say</i>	<u>33.70</u>	
		<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	Tack Coat					
		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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 3500 sqm</i>					
		a) Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	2.800	422.00	1181.60	P&M-031
		Air compressor 250 cfm	hour	2.800	405.00	1134.00	P&M-001
		Emulsion pressure distributor @ 1750 sqm per hour	hour	2.000	1011.00	2022.00	P&M-016
		c) Material					
		Bitumen emulsion @ 0.2 kg per sqm	tonne	0.700	43116.00	30181.20	M-077
		d) Overhead charges @ 0.1 on (a+b+c)				3484.65	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				3833.11	
		Cost for 3500 sqm = a+b+c+d+e				42164.24	
		Rate per sqm = (a+b+c+d+e)/3500				12.05	
					<i>say</i>	<u>12.00</u>	
		<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	Bituminous Macadam					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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	171.00	143.64	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	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP 100-120 TPH @ 75 tonne per hour actual output	hour	6.000	29942.00	179652.00	P&M-022
		Mechanical broom hydraulic @ 1250 sqm per hour	hour	2.200	422.00	928.40	P&M-031
		Air compressor 250 cfm	hour	2.200	405.00	891.00	P&M-001
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2889.00	17334.00	P&M-034
		Generator 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	1614.00	6294.60	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		<b>c) Material</b>					
		<b>i) Bitumen@ 3.3 per cent of mix</b>	tonne	14.850	48460.30	719635.46	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	461.26	20069.42	M-049
		25 - 10 mm 45 per cent	cum	130.550	588.46	76823.45	M-046
		10 - 5 mm 25 per cent	cum	72.530	508.74	36898.91	M-040
		5 mm and below 15 per cent	cum	43.510	195.72	8515.78	M-030
		or					
		<b>Grading II (19 mm nominal size)</b>					
		25 - 10 mm 40 per cent	cum	116.040	588.46	68284.90	M-046
		10 - 5 mm 40 per cent	cum	116.040	508.74	59034.19	M-040
		5 mm and below 20 per cent	cum	58.020	195.72	11355.67	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 @ 0.1 on (a+b+c)				110589.03	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				121647.93	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 205 cum = a+b+c+d+e				1338127.28	
		Rate per cum = (a+b+c+d+e)/205 (For Grading I)				6527.45	
					<i>say</i>	<u>6527.00</u>	
	(ii)	for GradingII(19 mm nominal size)					
		d) Overhead charges @ 0.1 on (a+b+c)				110225.75	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				121248.33	
		Cost for 205 cum = a+b+c+d+e				1333731.58	
		Rate per cum = (a+b+c+d+e)/205 (For Grading-II)				6506.01	
					<i>say</i>	<u>6506.00</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 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					
		<i>Unit = sqm</i>					
		<i>Taking output = 4500 sqm (225 cum)</i>					
		a) Labour					
		Mate	day	0.320	171.00	54.72	L-12
		Mazdoor including for brooming of key aggregates	day	6.000	157.00	942.00	L-13
		Mazdoor skilled	day	2.000	200.00	400.00	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	3332.00	19992.00	P&M-025
		Bitumen pressure distributor for @ 1750 sqm per hour	hour	2.570	1356.00	3484.92	P&M-004
		Tipper 5.5 cum capacity for carriage of aggregates from stockpile to chip spreader	hour	10.000	787.00	7870.00	P&M-048
		Vibratory roller 8 tonnes	hour	6.000	1614.00	9684.00	P&M-059
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		c) Material					
		Bitumen@ 5 kg per sqm	tonne	22.500	48460.30	1090356.75	M-074
		Crushed stone coarse aggregate passing 45 mm and retained on 2.8 mm sieve @ 0.06 cum per sqm	cum	270.000	453.47	122436.90	M-033
		Key aggregates passing 22.4 mm and retained on 2.8 mm sieve @ 0.015 cum per sqm	cum	67.500	507.98	34288.65	M-031
		d) Overhead charges @ 0.1 on (a+b+c)				129593.59	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				142552.95	
		Cost for 4500 sqm = a+b+c+d+e				1568082.49	
		Rate per sqm = (a+b+c+d+e)/4500				348.46	
					<i>say</i>	<u>348.00</u>	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Note	2 tippers will be needed to match the capacity of chip spreader and front end loader.					
5.4		B	75 mm thick					
			<i>Unit = sqm</i>					
			<i>Taking output = 4500 sqm (337.5 cum compacted).</i>					
		a)	Labour					
			Mate	day	0.400	171.00	68.40	L-12
			Mazdoor including for brooming of key aggregates	day	8.000	157.00	1256.00	L-13
			Mazdoor skilled	day	2.000	200.00	400.00	L-15
		b)	Machinery					
			Hydraulic self propelled chip spreader both for aggregates and key aggregates@ 1500 sqm per hour for 4500 x 2 sqm	hour	6.000	3332.00	19992.00	P&M-025
			Bitumen pressure distributor for@ 1750 sqm per hour	hour	2.570	1356.00	3484.92	P&M-004
			Tipper 5.5 cum capacity for carriage of aggregates from stockpile to chip spreader	hour	10.000	787.00	7870.00	P&M-048
			Vibratory roller 8 tonnes	hour	6.000	1614.00	9684.00	P&M-059
			Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		c)	Material					
			Bitumen@ 6.8 kg per sqm	tonne	30.600	48460.30	1482885.18	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	412.37	167009.85	M-037
			Key aggregates passing 26.5 mm and retained on 2.8 mm sieve @ 0.018 cum per sqm	cum	81.000	480.94	38956.14	M-026
		d)	Overhead charges @ 0.1 on (a+b+c)				173803.25	
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				191183.57	
			Cost for 4500 sqm = a+b+c+d+e				2103019.31	
			Rate per sqm = (a+b+c+d+e)/4500				467.34	
						say	<u>467.00</u>	
		Note	2 tippers and 2 rollers will be needed to match the capacity of chip spreader and front end loader.					
5.5	506		Built-up-Spray Grout					
			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					
			<i>Unit = sqm</i>					
			<i>Taking output = 3000 sqm (225 cum)</i>					
		a)	Labour					
			Mate	day	0.400	171.00	68.40	L-12
			Mazdoor including for brooming of key aggregates	day	8.000	157.00	1256.00	L-13
			Mazdoor skilled	day	2.000	200.00	400.00	L-15
		b)	Machinery					
			Hydraulic self propelled chip spreader both for aggregates and key aggregates@ 1500 sqm per hour for 3000 x 3 sqm	hour	6.000	3332.00	19992.00	P&M-025
			Bitumen pressure distributor for 3000 x 2 sqm @ 1750 sqm per hour	hour	3.430	1356.00	4651.08	P&M-004
			Tipper 5.5 cum capacity	hour	10.000	787.00	7870.00	P&M-048
			Vibratory roller 8 tonnes	hour	6.000	1614.00	9684.00	P&M-059
			Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		c)	Material					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Bitumen 30 kg per 10 sqm @ 15 kg per 10 sqm for each layer	tonne	9.000	48460.30	436142.70	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	453.47	136041.00	M-035
		Key aggregates passing 22.4 mm and retained on 2.8 mm sieve @ 0.13 cum per 10 sqm	cum	39.000	507.98	19811.22	M-031
		d) Overhead charges @ 0.1 on (a+b+c)				64234.24	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				70657.66	
		Cost for 3000 sqm = a+b+c+d+e				777234.30	
		Rate per sqm = (a+b+c+d+e)/3000				259.08	
					<i>say</i>	<u>259.00</u>	
		<b>Note</b> 2 tipper 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.					
		<i>Unit = cum</i>					
		<i>Taking output = 195 cum (450 tonnes)</i>					
		<b>a) Labour</b>					
		Mate	day	0.840	171.00	143.64	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	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	29942.00	179652.00	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2889.00	17334.00	P&M-034
		Generator 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	1614.00	6294.60	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		<b>c) Materials</b>					
		Bitumen @ 4.25 per cent of weight of mix	tonne	19.130	48460.30	927045.54	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					
		<i>Taking density of aggregate = 1.5 ton/cum</i>					
		Volume of aggregate = 287.25 cum					
		<b>Grading - I 40 mm (Nominal Size)</b>					
		37.5 - 25 mm 22 per cent	cum	63.190	461.26	29147.02	M-049
		25 - 10 mm 13 per cent	cum	37.340	588.46	21973.10	M-046

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		10 -4.75 mm 19 per cent	cum	54.580	508.74	27767.03	M-040
		4.75 mm and below 44 per cent	cum	126.390	195.72	24737.05	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3069.00	26454.78	M-188
		or					
		<b>Grading - II 19 mm (Nominal Size)</b>					
		25 - 10 mm 30 per cent	cum	86.160	588.46	50701.71	M-046
		10 - 5 mm 28 per cent	cum	80.430	508.74	40917.96	M-040
		5 mm and below 40 per cent	cum	114.900	195.72	22488.23	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3069.00	26454.78	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 @ 0.1 on (a+b+c)				129925.24	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				142917.76	
		Cost for 195 cum = a+b+c+d+e				1572095.41	
		Rate per cum = (a+b+c+d+e)/195 (For Grading I)				8062.03	
					say	<u>8062.00</u>	
	(ii)	<b>For GradingII (19 mm nominal size)</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				130973.61	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				144070.97	
		Cost for 195 cum = a+b+c+d+e				1584780.69	
		Rate per cum = (a+b+c+d+e)/195 (For Grading-II)				8127.08	
					say	<u>8127.00</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>					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 195 cum (450 tonnes)</i>					



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.840	171.00	143.64	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	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		b) Machinery					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	29942.00	179652.00	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2889.00	17334.00	P&M-034
		Generator 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	1614.00	6294.60	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		c) Material					
		* Grading I: 13 mm (Nominal Size)					
		i) Bitumen@ 4.5 per cent of weight of mix	tonne	20.250	48460.30	981321.08	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	617.12	35360.98	M-044
		10 - 5 mm 38 per cent	cum	108.870	508.74	55386.52	M-040
		5 mm and below 40 per cent	cum	114.600	195.72	22429.51	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3069.00	26454.78	M-188
		or					
		Grading II: 10 mm (Nominal Size)					
		Bitumen@5 per cent of weight of mix	tonne	22.500	48460.30	1090356.75	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	508.74	82644.81	M-040
		4.75 and below@ 41 per cent	cum	116.850	195.72	22869.88	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3069.00	26454.78	M-188
		*Any one of the alternative may be adopted as per approved design					
	(i)	for Grading I ( 13 mm nominal size )					
		d) Overhead charges @ 0.1 on (a+b+c)				136308.08	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				149938.88	
		Cost for 195 cum = a+b+c+d+e				1649327.72	
		Rate per cum = (a+b+c+d+e)/195 (For Grading I)				8458.09	
					say	<u>8458.00</u>	
5.7	(ii)	for GradingII(10 mm nominal size)					

## Analysis of Rate

Sr No	Ref. to MORTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 0.1 on (a+b+c)				146445.41	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				161089.95	
		Cost for 195 cum = a+b+c+d+e				1771989.48	
		Rate per cum = (a+b+c+d+e)/195 (For Grading-II)				9087.13	
					<i>say</i>	<u>9087.00</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 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					
		<i>Unit = cum</i>					
		<i>Taking output = 191 cum (450 tonnes)</i>					
		<b>a) Labour</b>					
		Mate	day	0.840	171.00	143.64	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	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	29942.00	179652.00	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2889.00	17334.00	P&M-034
		Generator 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	1614.00	6294.60	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		<b>c) Material</b>					
		i) Bitumen@ 5 per cent of weight of mix	tonne	22.500	48460.30	1090356.75	M-074
		ii) Aggregate					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 22.5 tonnes					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Weight of aggregate = 450 -22.50 = 427.50 tonnes					
		<i>Taking density of aggregate = 1.5 ton/cum</i>					
		Volume of aggregate = 285 cum					
		<b>* Grading - I-19 mm (Nominal Size)</b>					
		20 - 10 mm 35 per cent	cum	99.750	617.12	61557.72	M-045
		10 - 5 mm 23 per cent	cum	65.550	508.74	33347.91	M-040
		5 mm and below 40 per cent	cum	114.000	195.72	22312.08	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3069.00	26454.78	M-188
		or					
		<b>Grading - II-13 mm (Nominal Size)</b>					
		13.2 - 10 mm 30 per cent	cum	85.500	617.12	52763.76	M-044
		10 - 5 mm 25 per cent	cum	71.250	508.74	36247.73	M-040
		5 mm and below 43 per cent	cum	122.550	195.72	23985.49	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3069.00	26454.78	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 @ 0.1 on (a+b+c)				147615.71	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				162377.28	
		Cost for 191 cum = a+b+c+d+e				1786150.12	
		Rate per cum = (a+b+c+d+e)/191				9351.57	
					<i>say</i>	<u>9352.00</u>	
5.8	(ii)	<b>for Grading-II (10 mm nominal size)</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				147193.64	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				161913.00	
		Cost for 191 cum = a+b+c+d+e				1781043.03	
		Rate per cum = (a+b+c+d+e)/191 (For Grading-II)				9324.83	
					<i>say</i>	<u>9325.00</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.					
5.9	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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 9000 sqm</i>					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Case - I :-19 mm nominal chipping size					
		a) Labour					
		Mate	day	0.440	171.00	75.24	L-12
		Mazdoor	day	9.000	157.00	1413.00	L-13
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	422.00	3038.40	P&M-031
		Air compressor 250 cfm	hour	7.200	405.00	2916.00	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	3332.00	19992.00	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	787.00	4722.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Bitumen pressure distributor	hour	6.000	1356.00	8136.00	P&M-004
		Smooth wheeled roller 8-10 tonne weight	hour	6.000	604.00	3624.00	P&M-044
		c) Material					
		Bitumen@ 1.20 kg per sqm	tonne	10.800	48460.30	523371.24	M-074
		Crushed stone chipping, 19 mm nominal size @ 0.015 cum per sqm	cum	135.000	529.62	71498.70	M-053
		d) Overhead charges @ 0.1 on (a+b+c)				64561.26	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				71017.38	
		Cost for 9000 sqm = a+b+c+d+e				781191.22	
		Rate per sqm = (a+b+c+d+e)/9000				86.80	
					<i>say</i>	<u>87.00</u>	
5.9		Case - II 13 mm nominal size chipping					
		a) Labour					
		Mate	day	0.440	171.00	75.24	L-12
		Mazdoor	day	9.000	157.00	1413.00	L-13
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	422.00	3038.40	P&M-031
		Air compressor 250 cfm	hour	7.200	405.00	2916.00	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	3332.00	19992.00	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	787.00	4722.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1356.00	8136.00	P&M-004
		Vibratory roller 8-10 tonne weight	hour	6.000	1614.00	9684.00	P&M-059
		c) Material					
		Bitumen@ 1.00 kg per sqm	tonne	9.000	48460.30	436142.70	M-074
		Crushed stone chipping, 13 mm nominal size @ 0.01 cum per sqm	cum	90.000	617.12	55540.80	M-052
		d) Overhead charges @ 0.1 on (a+b+c)				54848.61	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				60333.48	
		Cost for 9000 sqm = a+b+c+d+e				663668.23	
		Rate per sqm = (a+b+c+d+e)/9000				73.74	
					<i>say</i>	<u>74.00</u>	
		Note					
		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.					
5.10	511	Open - Graded Premix Surfacing					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 10250 sqm (205 cum)</i>					
	(i)	Case - I: Mechanical method using Penetration grade Bitumen and HMP of appropriate capacity not less than 75 tonnes/hour .					
		a) Labour					
		Mate	day	0.840	171.00	143.64	L-12
		Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		b) Machinery					
		i) Batch type HMP 75 tonne per hour	hour	6.000	29942.00	179652.00	P&M-022
		ii) Electric Generator Set 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		iii) Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		iv) Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		v) Paver finisher hydrostatic with sensor attachment	hour	6.000	2889.00	17334.00	P&M-034
		iv) Smooth wheeled/tandem roller 8-10 tonnes weight	hour	6.000	1447.00	8682.00	P&M-045
		c) Material					
		Bitumen@ 14.60 kg per 10 sqm	tonne	14.970	48460.30	725450.69	M-074
		Crushed stone chipping,13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	276.750	589.97	163274.20	M-043
		d) Overhead charges @ 0.1 on (a+b+c)				112524.13	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				123776.54	
		Cost for 10250 sqm = a+b+c+d+e				1361541.95	
		Rate per sqm = (a+b+c+d+e)/10250				132.83	
					<i>say</i>	<u>133.00</u>	
	Note	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	(ii)	Case - II: Open-Graded Premix Surfacing using cationic Bitumen Emulsion					
		<i>Unit = sqm</i>					
		<i>Taking output = 900 sqm (24.3 cum)</i>					
		a) Labour					
		Mate	day	0.800	171.00	136.80	L-12
		Mazdoor	day	18.000	157.00	2826.00	L-13
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		b) Machinery					
		Concrete mixer 0.4/0.28 cum capacity	hour	6.000	58.00	348.00	P&M-009
		Smooth wheeled steel roller 8-10 tonne	hour	6.000	604.00	3624.00	P&M-044

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Material					
		Cationic Bitumen Emulsion @ 21.50 kg per 10 sqm	tonne	1.940	43116.00	83645.04	M-073
		Crushed stone aggregates 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	24.300	589.97	14336.27	M-043
		d) Overhead charges @ 0.1 on (a+b+c)				10531.61	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				11584.77	
		Cost for 900 sqm = a+b+c+d+e				127432.49	
		Rate per sqm = (a+b+c+d+e)/900				141.59	
					<i>say</i>	<u>142.00</u>	
5.11	512	Close Graded Premix Surfacing/Mixed Seal Surfacing					
		Case I 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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 10250 sqm (205 cum)</i>					
		a) Labour					
		Mate	day	0.840	171.00	143.64	L-12
		Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		b) Machinery					
		i) HMP of appropriate capacity - 75 t per hour	hour	6.000	29942.00	179652.00	P&M-022
		ii) Electric Generator Set 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		iii) Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		iv) Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		v) Paver finisher hydrostatic with sensor attachment	hour	6.000	2889.00	17334.00	P&M-034
		iv) Smooth wheeled 8-10 tonnes weight	hour	6.000	604.00	3624.00	P&M-044
		c) Material					
		Type - A					
		* Bitumen @ 22 kg per 10 sqm	tonne	22.500	48460.30	1090356.75	M-074
		Stone crushed aggregates 11.2 mm to 0.09 @ 0.27 cum per 10 sqm	cum	276.750	333.95	92420.66	M-041
		or					
		Type - B					
		Bitumen @ 19 kg per 10 sqm	tonne	19.480	48460.30	944006.64	M-074
		Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	276.750	452.61	125259.82	M-042
		d) Overhead charges @ 0.1 on (a+b+c)				141423.58	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				155565.94	
		Cost for 10250 sqm = a+b+c+d+e				1711225.32	
		Rate per sqm = (a+b+c+d+e)/10250				166.95	
		For Type 'A'			<i>say</i>	<u>167.00</u>	
		For Type 'B'			<i>say</i>	<u>154.00</u>	
		* Any one of the alternative may be adopted					
5.12	513	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 A and B seal coats					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<i>Unit = sqm</i>					
		<i>Taking output = 10250 sqm (92.25 cum)</i>					
	(i)	Case - I : Type A					
		a) Labour					
		Mate	day	0.240	171.00	41.04	L-12
		Mazdoor	day	6.000	157.00	942.00	L-13
		b) Machinery					
		Hydraulic self propelled chip spreader	hour	6.000	3332.00	19992.00	P&M-025
		Tipper 5.5 cum capacity	hour	6.000	787.00	4722.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1356.00	8136.00	P&M-004
		Smooth wheeled roller 8 -10 tonne weight	hour	6.000	604.00	3624.00	P&M-044
		c) Material					
		Bitumen@ 9.80 kg per 10 sqm	tonne	10.050	48460.30	487026.02	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	394.20	36364.95	M-050
		d) Overhead charges @ 0.1 on (a+b+c)				56727.40	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				62400.14	
		Cost for 10250 sqm = a+b+c+d+e				686401.55	
		Rate per sqm = (a+b+c+d+e)/10250				66.97	
					<i>say</i>	<u>67.00</u>	
	Note	Since seal coat is provided immediately over the bituminous layers, mechanical broom for clearing has not been catered.					
5.12	(ii)	Case - II : Type 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>Unit = sqm</i>					
		<i>Taking output = 7858 sqm (47.16 cum)</i>					
		a) Labour					
		Mate	day	0.160	171.00	27.36	L-12
		Mazdoor	day	4.000	157.00	628.00	L-13
		b) Machinery					
		HMP of 75 tonnes/hour.	hour	2.000	29942.00	59884.00	P&M-022
		Electric Generator Set 250 KVA	hour	2.000	2896.00	5792.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	2.000	1071.00	2142.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	104 x 'L'	6.85	712.40	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				71.24	
		Paver finisher hydrostatic with sensor attachment	hour	2.000	2889.00	5778.00	P&M-034
		Smooth wheeled 8-10 tonnes capacity	hour	2.000	604.00	1208.00	P&M-044
		c) Material					
		Bitumen@ 6.80 kg per 10 sqm	tonne	5.340	48460.30	258778.00	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	394.20	18590.47	M-050
		d) Overhead charges @ 0.1 on (a+b+c)				35361.15	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				38897.26	
		Cost for 7858 sqm = a+b+c+d+e				427869.88	
		Rate per sqm = (a+b+c+d+e)/7858				54.45	
					<i>say</i>	<u>54.00</u>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 35.00 sqm (0.87 cum ) assuming a density of 2.3 tonnes/cum.-2 tonnes</i>					
		<b>a) Labour</b>					
		Mate	day	0.440	171.00	75.24	L-12
		Mazdoor	day	10.000	157.00	1570.00	L-13
		Mazdoor skilled	day	1.000	200.00	200.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	0.060	422.00	25.32	P&M-031
		Air compressor 250 cfm	hour	0.060	405.00	24.30	P&M-001
		Mastic cooker 1 tonne capacity	hour	6.000	78.00	468.00	P&M-030
		Bitumen boiler 1500 litres capacity	hour	6.000	251.00	1506.00	P&M-005
		Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.000	459.00	459.00	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	51378.00	10481.11	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	92.57	36.10	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	3069.00	1104.84	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	589.97	324.48	M-043



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		v) Pre-coated stone chips of 13.2 mm nominal size for skid resistance = $35 \times 0.005/10 = 0.018$	cum	0.018	617.12	11.11	M-142
		vi) Bitumen for coating of chips @ 2 per cent by weight = $0.018 \times 1.456 \times 2/100 = 0.0005 \text{ MT} = 0.5\text{kg}$	kg	0.500	51.38	25.69	M-197
		d) Overhead charges @ 0.1 on (a+b+c)				1631.12	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1794.23	
		Cost for 35.00 sqm = a+b+c+d+e				19736.55	
		Rate per sqm = (a+b+c+d+e)/35				563.90	
					<i>say</i>	<u>564.00</u>	
		<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.					
		4.This rate analysis is based on design made by CRRI for a specific case and is meant for estimating purposes only. Actual design is required to be done for each case.					
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.					
		Case (i) <b>5 mm thickness</b>					
		<i>Unit = sqm</i>					
		<i>Taking output = 16000 sqm (80 cum)</i>					
		<i>Taking density of 2.2 tonnes per cum</i>					
		weight of mix = 176 tonnes					
		<b>a) Labour</b>					
		Mate	day	0.240	171.00	41.04	L-12
		Mazdoor	day	6.000	157.00	942.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom	hour	6.000	422.00	2532.00	P&M-031
		Air compressor 250 cfm	hour	6.000	405.00	2430.00	P&M-001
		Mobile slurry seal equipment	hour	6.000	1275.00	7650.00	P&M-033
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	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	787.00	4722.00	P&M-048
		Pneumatic tyred roller with individual wheel load not exceeding 1.5 tonnes	hour	6.000	1573.00	9438.00	P&M-037
		Water tanker 6 KL capacity	hour	2.000	154.00	308.00	P&M-060
		<b>c) Material</b>					
		Residual Binder @ 11 per cent of mix 80 x 2.2 x 0.11	tonne	19.360	43116.00	834725.76	M-077
		Fine aggregate 4.75 mm and below 87 per cent of total mix, $80 \times 2.2 \times 0.87 = 153.12$ tonnes. Taking density 1.5, = $153.12/1.5 = 102.08$ cum	cum	102.080	195.72	19979.10	M-030
		Filler @ 2 per cent of total mix = $80 \times 2.2 \times 0.02$	tonne	3.520	3069.00	10802.88	M-188
		Cost of water	KL	12.000	225.00	2700.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				90269.68	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				99296.65	
		Cost for 16000 sqm = a+b+c+d+e				1092263.10	
		Rate per sqm = (a+b+c+d+e)/16000				68.27	
					<i>say</i>	<u>68.00</u>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
5.15		Case (ii)	3 mm thickness					
			<i>Unit = sqm</i>					
			<i>Taking output = 20000 sqm (60 cum)</i>					
			a) Labour					
			Mate	day	0.200	171.00	34.20	L-12
			Mazdoor	day	5.000	157.00	785.00	L-13
			b) Machinery					
			Mechanical broom	hour	6.000	422.00	2532.00	P&M-031
			Air compressor 250 cfm	hour	6.000	405.00	2430.00	P&M-001
			Mobile slurry seal equipment	hour	6.000	1275.00	7650.00	P&M-033
			Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	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	787.00	4722.00	P&M-048
			Water tanker 6 KL capacity	hour	2.000	154.00	308.00	P&M-060
			c) Material					
			Residual Binder @ 13 per cent of mix = 60 x 2.2 x 0.13	tonne	17.160	43116.00	739870.56	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	181.88	13604.62	M-022
			Filler @ 2 per cent of total mix = 60x 2.2 x 0.02	tonne	2.640	3069.00	8102.16	M-188
			Cost of water	KL	12.000	225.00	2700.00	M-189
			d) Overhead charges @ 0.1 on (a+b+c)				78916.45	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				86808.10	
			Cost for 20000 sqm = a+b+c+d+e				954889.10	
			Rate per sqm = (a+b+c+d+e)/20000				47.74	
						<i>say</i>	<u>48.00</u>	
5.15		Case (iii)	1.5 mm thickness					
			<i>Unit = sqm</i>					
			<i>Taking output = 24000 sqm (36 cum)</i>					
			a) Labour					
			Mate	day	0.200	171.00	34.20	L-12
			Mazdoor	day	5.000	157.00	785.00	L-13
			b) Machinery					
			Mechanical broom	hour	6.000	422.00	2532.00	P&M-031
			Air compressor 250 cfm	hour	6.000	405.00	2430.00	P&M-001
			Mobile slurry seal equipment	hour	6.000	1275.00	7650.00	P&M-033
			Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	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	787.00	4722.00	P&M-048
			Water tanker 6 KL capacity	hour	2.000	154.00	308.00	P&M-060
			c) Material					
			Residual Binder @ 16 per cent of mix, 36 x 2.2 x 0.16	tonne	12.670	43116.00	546279.72	M-077
			Fine aggregate 2.36 mm and below, 82 per cent of total mix, 36x 2.2 x 0.82 = 64.94 tonnes. Taking density 1.5	cum	43.300	181.88	7875.40	M-022
			Filler @ 2 per cent of total mix = 36x 2.2 x 0.02	tonne	1.580	3069.00	4849.02	M-188
			Cost of water	KL	12.000	225.00	2700.00	M-189
			d) Overhead charges @ 0.1 on (a+b+c)				58659.13	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				64525.05	
			Cost for 24000 sqm = a+b+c+d+e				709775.53	
			Rate per sqm = (a+b+c+d+e)/24000				29.57	
						<i>say</i>	<u>29.60</u>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<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>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.					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum (276 tonnes)</i>					
			<b>a) Labour</b>					
			Mate	day	0.480	171.00	82.08	L-12
			Mazdoor	day	10.000	157.00	1570.00	L-13
			Mazdoor skilled	day	2.000	200.00	400.00	L-15
			<b>b) Machinery</b>					
			Cold milling machine @ 20 cum per hour	hour	6.000	1176.00	7056.00	P&M-069
			Mechanical broom @ 1250 sqm per hour	hour	1.280	422.00	540.16	P&M-031
			Air compressor 250 cfm	hour	1.280	405.00	518.40	P&M-001
			Bitumen pressure distributor @ 1750 sqm per hour	hour	0.910	1356.00	1233.96	P&M-004
			Hot mix plant 100-120 TPH producing an average of 75 tonnes per hour	hour	3.000	39379.00	118137.00	P&M-021
			Electric generator set 250 KVA	hour	3.000	2896.00	8688.00	P&M-081
			Front end loader 1.00 cum bucket capacity	hour	3.000	1071.00	3213.00	P&M-017
			Tipper 5.5 cum capacity	hour	18.000	787.00	14166.00	P&M-048
			Smooth wheeled roller 8-10 tonnes	hour	3.00x0.65*	604.00	1177.80	P&M-044
			Vibratory roller 8 tonnes	hour	3.00x0.65*	1614.00	3147.30	P&M-059
			Smooth wheeled tandem roller 6-8 tonnes	hour	3.00x0.65*	1447.00	2821.65	P&M-045
			<b>c) Material</b>					
			<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 = $82.8 \times 0.60 \times 0.04 = 1.99$	tonne	1.9872	48460.30	96300.31	M-074
			Bitumen required for fresh mix of 193.2 tonnes = $193.2 \times 0.04 = 7.73$	tonne	7.728	48460.30	374501.20	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					
			<i>Taking average density of 1.5 tonnes/cum, total volume of aggregate = 123.65 cum.</i>					
			Size wise requirement of fresh aggregates					
			37.5 - 25 mm @ 23 per cent	cum	28.440	461.26	13118.23	M-049
			25 - 10 mm @ 15 per cent	cum	18.550	588.46	10915.93	M-046
			10- 5 mm @ 20 per cent	cum	24.730	508.74	12581.14	M-040
			Below 5 mm @40 per cent	cum	49.460	195.72	9680.31	M-030
			Filler (cement) @ 2 per cent = 5.52tonnes of 276 tonne	tonne	5.520	5462.00	30150.24	M-081
			<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				70999.87	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				78099.86	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 120 cum of DBM = a+b+c+d+e				859098.45	
		Rate per cum = (a+b+c+d+e)/120				7159.15	
					<i>say</i>	<u>7159.00</u>	
		<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.					
5.17	518	<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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 10500 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	0.120	171.00	20.52	L-12
		Mazdoor	day	3.000	157.00	471.00	L-13
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	422.00	2532.00	P&M-031
		Air compressor 250 cfm	hour	6.000	405.00	2430.00	P&M-001
		Bitumen emulsion pressure distributor @ 1750 sqm per hour	tonne	6.000	1356.00	8136.00	P&M-004
		<b>c) Material</b>					
		Bitumen emulsion @ 0.75 kg per sqm	tonne	7.880	43116.00	339754.08	M-077
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				35334.36	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				38867.80	
		Cost for 10500 sqm = a+b+c+d+e				427545.76	
		Rate per sqm = (a+b+c+d+e)/10500				40.72	
					<i>say</i>	<u>41.00</u>	
		1. In case it is decided by the engineer to blind the fog spray, the following may be added					
		<b>a) Labour</b>					
		Mate	day	0.160	171.00	27.36	L-12
		Mazdoor for pre-coating of grit	day	4.000	157.00	628.00	L-13
		<b>b) Material</b>					
		Crushed stone grit 3 mm size @ 3.75 kg per sqm	cum	26.250	195.72	5137.65	M-024
		Bitumen emulsion for pre-coating grit @ 2 per cent of grit, 39.38 x 0.02	tonne	0.790	43116.00	34061.64	M-077
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				3985.47	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				4384.01	
		Cost for 10500 sqm = a+b+c+d				48224.13	
		Rate per sqm = (a+b+c+d)/10500				4.59	
					<i>say</i>	<u>4.60</u>	
5.18	519	<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>Unit = cum</i>					
		<i>Taking output = 205 cum (450 tonne)</i>					
		<b>Case (i) Using bitumen emulsion and 9.5 mm or 13.2 mm size aggregate</b>					
		Composition of mix (450 tonne) is assumed to be as under:-					
		Bitumen Emulsion 8 per cent	By weight of total mix				
		Filler 2 per cent					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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	171.00	143.64	L-12
		Mazdoor	day	16.000	157.00	2512.00	L-13
		Mazdoor skilled	day	5.000	200.00	1000.00	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	1523.00	9138.00	P&M-077
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Paver finisher	hour	6.000	2889.00	17334.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes	hour	6.00x0.65*	1573.00	6134.70	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		<b>c) Material</b>					
		Bitumen emulsion @ 8 per cent	tonne	36.000	43116.00	1552176.00	M-077
		Filler (lime)@ 2 per cent	tonne	9.000	3069.00	27621.00	M-188
		Aggregates size 19 to 9.5 mm - 450 x 0.25 x 1/1.5	cum	75.000	617.12	46284.00	M-045
		Aggregates size 9.5 to 6 mm - 450 x 0.29 x 1/1.5	cum	87.000	508.74	44260.38	M-040
		Aggregates size 6 to 0.075 mm - 450 x 0.36 x 1/1.5	cum	108.000	195.72	21137.76	M-030
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				175557.35	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				193113.09	
		Cost for 205 cum = a+b+c+d+e				2124243.97	
		<b>Rate per cum = (a+b+c+d+e)/205</b>				10362.17	
					<b>say</b>	<b><u>10362.00</u></b>	
		<b>(Applicable to cases I to IV)</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	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					
		<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 35 per cent					
		<b>a) Labour</b>					
		Mate	day	0.840	171.00	143.64	L-12
		Mazdoor	day	16.000	157.00	2512.00	L-13
		Mazdoor skilled	day	5.000	200.00	1000.00	L-15

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<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	1523.00	9138.00	P&M-077
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Paver finisher	hour	6.000	2889.00	17334.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes	hour	6.00x0.65*	1573.00	6134.70	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		<b>c) Material</b>					
		Bitumen emulsion @ 8 per cent	tonne	36.000	43116.00	1552176.00	M-077
		Filler (lime)@ 2 per cent	tonne	9.000	3069.00	27621.00	M-188
		Aggregates size 37.5 to 19 mm - 450 x 0.25 x 1/1.5	cum	75.000	461.26	34594.50	M-048
		Aggregates size 19 to 6 mm - 450 x 0.3 x 1/1.5	cum	90.000	507.98	45718.20	M-047
		Aggregates size 6 to 0.075 mm - 450 x 0.35 x 1/1.5	cum	105.000	195.72	20550.60	M-030
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				174475.47	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				191923.02	
		Cost for 205 cum = a+b+c+d+e				2111153.17	
		<b>Rate per cum = (a+b+c+d+e)/205</b>				10298.31	
					<i>say</i>	<b><u>10298.00</u></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	Case (iii)	Using cutback bitumen and 9.5 mm or 13.2 mm nominal size aggregate					
		Composition of mix (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	171.00	143.64	L-12
		Mazdoor	day	16.000	157.00	2512.00	L-13
		Mazdoor skilled	day	5.000	200.00	1000.00	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	1523.00	9138.00	P&M-077
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Paver finisher	hour	6.000	2889.00	17334.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes	hour	6.00x0.65*	1573.00	6134.70	P&M-037

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		<b>c) Material</b>					
		Cutback bitumen @ 5 per cent	tonne	22.500	48460.30	1090356.75	M-076
		Filler (lime)@ 2 per cent	tonne	9.000	3069.00	27621.00	M-188
		Aggregates size 19 to 9.5 mm - 450 x 0.26 x 1/1.5	cum	78.000	617.12	48135.36	M-045
		Aggregates size 9.5 to 6 mm - 450 x 0.31 x 1/1.5	cum	93.000	508.74	47312.82	M-040
		Aggregates size 6 to 0.075 mm - 450 x 0.36 x 1/1.5	cum	108.000	195.72	21137.76	M-030
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				129865.81	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				142852.39	
		Cost for 205 cum = a+b+c+d+e				1571376.28	
		<b>Rate per cum = (a+b+c+d+e)/205</b>				7665.25	
					<i>say</i>	<u>7665.00</u>	
		<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	Case (iv)	<b>Using cutback bitumen and 19 mm or 26.5 mm nominal size aggregate</b>					
		Composition of mix (450 tonne) is assumed to be as under:-					
		Cutback bitumen 5 per cent					
		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	171.00	143.64	L-12
		Mazdoor	day	16.000	157.00	2512.00	L-13
		Mazdoor skilled	day	5.000	200.00	1000.00	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	1523.00	9138.00	P&M-077
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Paver finisher	hour	6.000	2889.00	17334.00	P&M-034
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1573.00	6134.70	P&M-037
		Smooth wheeled steel tandem roller 6-8 tonnes	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		<b>c) Material</b>					
		Cutback bitumen on @ 5 per cent	tonne	22.500	48460.30	1090356.75	M-076
		Filler (lime)@ 2 per cent	tonne	9.000	3069.00	27621.00	M-188
		Aggregates size 37.5 to 19 mm - 450 x 0.25 x 1/1.5	cum	75.000	461.26	34594.50	M-048
		Aggregates size 19 to 6 mm - 450 x 0.3 x 1/1.5	cum	90.000	507.98	45718.20	M-047
		Aggregates size 6 to 0.075 mm - 450 x 0.38 x 1/1.5	cum	114.000	195.72	22312.08	M-030
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				128469.69	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				141316.66	
		Cost for 205 cum = a+b+c+d+e				1554483.27	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per cum = (a+b+c+d+e)/205				7582.85	
					<i>say</i>	<u>7583.00</u>	
		<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					
5.19	520	<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.					
		<i>Unit = cum</i>					
		<i>Taking output = 205 cum (450 tonne)</i>					
		<b>a) Labour</b>					
		Mate	day	0.840	171.00	143.64	L-12
		Mazdoor	day	16.000	157.00	2512.00	L-13
		Mazdoor skilled	day	5.000	200.00	1000.00	L-15
		<b>b) Machinery</b>					
		Hot Mix Plant of appropriate capacity but not less than 75 tonnes/hour	hour	6.000	25209.00	151254.00	P&M-023
		Electric generator set 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Paver finisher	hour	6.000	2889.00	17334.00	P&M-034
		smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65	604.00	2355.60	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65	1614.00	6294.60	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem rollers.	hour	6.00x0.65	1447.00	5643.30	P&M-045
		<b>c) Material</b>					
		Composition of mix (450 tonne) is assumed to be as under:-					
		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	48460.30	1090356.75	M-074
		Filler (lime) @ 2 per cent	tonne	9.000	3069.00	27621.00	M-188
		Sand of size 4.75 to 0.075 mm - 450 x 0.93 x 1/1.5	cum	288.620	133.28	38467.27	M-004
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				137017.49	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				150719.24	
		Cost for 205 cum = a+b+c+d+e				1657911.65	
		Rate per cum = (a+b+c+d+e)/205				8087.37	
					<i>say</i>	<u>8087.00</u>	
		<b>Note</b> 1. Tack coat will be measured and paid separately					



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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					
5.20	521	<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.					
		<i>Unit = tonne</i>					
		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.					
		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>					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Case (i) Stress absorbing membrane (SAM) crack width less than 6 mm					
		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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 10500 sqm</i>					
		a) Labour					
		Mate	day	0.240	171.00	41.04	L-12
		Mazdoor	day	6.000	157.00	942.00	L-13
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	422.00	2532.00	P&M-031
		Air compressor 250 cfm	hour	6.000	405.00	2430.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1356.00	8136.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	3332.00	19992.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	604.00	3624.00	P&M-044
		c) Material					
		Modified binder	tonne	9.450	48563.30	458923.19	M-078
		Crushed stone aggregates 5.6 mm size	cum	105.000	394.20	41391.00	M-050
		d) Overhead charges @ 0.1 on (a+b+c)				53801.12	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				59181.23	
		Cost for 10500 sqm = a+b+c+d+e				650993.58	
		Rate per sqm = (a+b+c+d+e)/10500				62.00	
					<i>say</i>	<u>62.00</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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 10500 sqm</i>					
		a) Labour					
		Mate	day	0.240	171.00	41.04	L-12
		Mazdoor	day	6.000	157.00	942.00	L-13
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	422.00	2532.00	P&M-031
		Air compressor 250 cfm capacity	hour	6.000	405.00	2430.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1356.00	8136.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	3332.00	19992.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	604.00	3624.00	P&M-044
		c) Material					
		Modified binder	tonne	11.550	48563.30	560906.12	M-078
		Crushed stone chipping 11.2 mm size	cum	105.000	589.97	61946.85	M-051
		d) Overhead charges @ 0.1 on (a+b+c)				66055.00	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				72660.50	
		Cost for 10500 sqm = a+b+c+d+e				799265.51	
		Rate per sqm = (a+b+c+d+e)/10500				76.12	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					<i>say</i>	<u>76.00</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					
		<i>Unit = sqm</i>					
		<i>Taking output = 10500 sqm</i>					
		a) Labour					
		Mate	day	0.240	171.00	41.04	L-12
		Mazdoor	day	6.000	157.00	942.00	L-13
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	6.000	422.00	2532.00	P&M-031
		Air compressor 250 cfm capacity	hour	6.000	405.00	2430.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1356.00	8136.00	P&M-004
		Hydraulic Chip spreader	hour	6.000	3332.00	19992.00	P&M-025
		Smooth wheeled road roller 8-10 tonne	hour	6.000	604.00	3624.00	P&M-044
		c) Material					
		Modified binder	tonne	15.750	48563.30	764871.98	M-078
		Crushed stone aggregates 11.2 mm size	cum	126.000	589.97	74336.22	M-051
		d) Overhead charges @ 0.1 on (a+b+c)				87730.52	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				96503.58	
		Cost for 10500 sqm = a+b+c+d+e				1061539.33	
		Rate per sqm = (a+b+c+d+e)/10500				101.10	
					<i>say</i>	<u>101.00</u>	
		Note					
		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		Case(iv) Case - IV : Bitumen impregnated geotextile					
		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					
		<i>Unit = sqm</i>					
		<i>Taking output = 3500 sqm</i>					
		a) Labour					
		Mate	day	0.560	171.00	95.76	L-12
		Mazdoor	day	12.000	157.00	1884.00	L-13
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	2.800	422.00	1181.60	P&M-031
		Air compressor 250 cfm capacity	hour	2.800	405.00	1134.00	P&M-001
		Bitumen pressure distributor @ 1750 sqm per hour	tonne	2.000	1356.00	2712.00	P&M-004
		Pneumatic roller	hour	2.000	1573.00	3146.00	P&M-037
		c) Material					
		Paving grade bitumen of 80 - 100 penetration @ 1.05 kg per sqm	tonne	3.680	47544.90	174965.23	M-075
		Geotextile including 10 per cent for overlaps	sqm	3850.000	80.63	310425.50	M-108
		d) Overhead charges @ 0.1 on (a+b+c)				49594.41	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				54553.85	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 3500 sqm = a+b+c+d+e				600092.35	
		Rate per sqm = (a+b+c+d+e)/3500				171.45	
					<i>say</i>	<u>171.00</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 bitumenious 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					
		<i>Unit = cum</i>					
		<i>Taking output = 205 cum (450 tonnes)</i>					
		Case(i) 75 mm thickness					
		a) Labour					
		Mate	day	1.000	171.00	171.00	L-12
		Mazdoor	day	12.000	157.00	1884.00	L-13
		Mazdoor skilled	day	5.000	200.00	1000.00	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	3136.00	18816.00	P&M-064
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1071.00	6426.00	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2889.00	17334.00	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Pneumatic tyred roller12-15 tonnes.	hour	6.00x0.65*	1573.00	6134.70	P&M-037
		Smooth wheeled steel roller6-8 tonnes.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Water tanker6 KL capacity	hour	1.000	154.00	154.00	P&M-060
		c) Material					
		Bitumen emulsion @ 45 litres per tonne	tonne	20.250	43116.00	873099.00	M-077
		Crushed stone aggregates 40 mm nominal size	cum	297.000	425.02	126230.94	M-055
		Cost of water	KL	6.000	225.00	1350.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				107071.80	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				117778.98	
		Cost for 205 sqm = a+b+c+d+e				1295568.77	
		Rate per sqm = (a+b+c+d+e)/205				6319.85	
					<i>say</i>	<u>6320.00</u>	
		<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) 40 mm thickness					
		a) Labour					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate	day	1.000	171.00	171.00	L-12
		Mazdoor	day	12.000	157.00	1884.00	L-13
		Mazdoor skilled	day	5.000	200.00	1000.00	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	3136.00	18816.00	P&M-064
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1071.00	6426.00	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2889.00	17334.00	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1573.00	6134.70	P&M-037
		Smooth wheeled steel roller 6-8 tonnes.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Water tanker 6 KL capacity	hour	1.000	154.00	154.00	P&M-060
		<b>c) Material</b>					
		Bitumen emulsion @ 70 litres per tonne	tonne	31.500	43116.00	1358154.00	M-077
		Crushed stone aggregates 14 mm nominal size	cum	287.000	617.12	177113.44	M-052
		Cost of water	KL	6.000	225.00	1350.00	M-189
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				160665.55	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				176732.10	
		Cost for 205 sqm = a+b+c+d+e				1944053.14	
		<b>Rate per sqm = (a+b+c+d+e)/205</b>				9483.19	
					<i>say</i>	<u>9483.00</u>	
5.22	Case(iii)	25 mm thickness					
		<b>a) Labour</b>					
		Mate	day	1.000	171.00	171.00	L-12
		Mazdoor	day	12.000	157.00	1884.00	L-13
		Mazdoor skilled	day	5.000	200.00	1000.00	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	3136.00	18816.00	P&M-064
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1071.00	6426.00	P&M-017
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	2889.00	17334.00	P&M-034
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Pneumatic tyred roller	hour	6.00x0.65*	1573.00	6134.70	P&M-037
		Smooth wheeled steel roller	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Water tanker 6 KL capacity	hour	1.000	154.00	154.00	P&M-060
		<b>c) Material</b>					
		Bitumen emulsion @ 85 litres per tonne	tonne	38.250	43116.00	1649187.00	M-077
		Crushed stone aggregates 6 mm nominal size	cum	270.000	394.20	106434.00	M-050
		Cost of water	KL	6.000	225.00	1350.00	M-189
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				182700.91	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				200971.00	
		Cost for 205 sqm = a+b+c+d+e				2210680.95	
		<b>Rate per sqm = (a+b+c+d+e)/205</b>				10783.81	
					<i>say</i>	<u>10784.00</u>	

## Analysis of Rate

### CHAPTER - 5A BASES AND SURFACE COURSES (BITUMINOUS)

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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 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>Unit = cum</i>					
		<i>Taking output = 205 cum (450 tonnes)</i>					
		<b>a) Labour</b>					
		Mate	day	0.840	171.00	143.64	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	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP 100-120 TPH @ 75 tonne per hour actual output	hour	6.000	29942.00	179652.00	P&M-022
		Mechanical broom hydraulic @ 1250 sqm per hour	hour	2.200	422.00	928.40	P&M-031
		Air compressor 250 cfm	hour	2.200	405.00	891.00	P&M-001
		Paver finisher hydrostatic with mechanical control @ 75 cum per hour	hour	6.000	1123.00	6738.00	P&M-035
		Generator 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	1614.00	6294.60	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		<b>c) Material</b>					
		<b>i) Bitumen@ 3.3 per cent of mix</b>	tonne	14.850	48460.30	719635.46	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					
		<i>Taking density of aggregate = 1.5 ton/cum</i>					
		Volume of aggregate = 290.1 cum					
		<b>*Grading I ( 40 mm nominal size )</b>					
		37.5 - 25 mm 15 per cent	cum	43.510	461.26	20069.42	M-049
		25 - 10 mm 45 per cent	cum	130.550	588.46	76823.45	M-046
		10 - 5 mm 25 per cent	cum	72.530	508.74	36898.91	M-040
		5 mm and below 15 per cent	cum	43.510	195.72	8515.78	M-030
		or					
		<b>Grading II (19 mm nominal size)</b>					
		25 - 10 mm 40 per cent	cum	116.040	588.46	68284.90	M-046
		10 - 5 mm 40 per cent	cum	116.040	508.74	59034.19	M-040
		5 mm and below 20 per cent	cum	58.020	195.72	11355.67	M-030

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		* Any one of the alternative may be adopted as per approved design					
	(i)	for Grading I ( 40 mm nominal size )					
		d) Overhead charges @ 0.1 on (a+b+c)				109529.43	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				120482.37	
		Cost for 205 cum = a+b+c+d+e				1325306.12	
		Rate per cum = (a+b+c+d+e)/205 (For Grading I)				6464.91	
					<i>say</i>	<u>6465.00</u>	
	(ii)	for GradingII(19 mm nominal size)					
		d) Overhead charges @ 0.1 on (a+b+c)				109166.15	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				120082.77	
		Cost for 205 cum = a+b+c+d+e				1320910.42	
		Rate per cum = (a+b+c+d+e)/205 (For Grading-II)				6443.47	
					<i>say</i>	<u>6443.00</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 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 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>Unit = cum</i>					
		<i>Taking output = 195 cum (450 tonnes)</i>					
		<b>a) Labour</b>					
		Mate	day	0.840	171.00	143.64	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	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	29942.00	179652.00	P&M-022
		Paver finisher hydrostatic with mechanical control @ 75 cum per hour	hour	6.000	1123.00	6738.00	P&M-035
		Generator 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	1614.00	6294.60	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		<b>c) Materials</b>					
		Bitumen @ 4.25 per cent of weight of mix	tonne	19.130	48460.30	927045.54	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					
		<i>Taking density of aggregate = 1.5 ton/cum</i>					
		Volume of aggregate = 287.25 cum					
		<b>Grading - I 40 mm (Nominal Size)</b>					
		37.5 - 25 mm 22 per cent	cum	63.190	461.26	29147.02	M-049
		25 - 10 mm 13 per cent	cum	37.340	588.46	21973.10	M-046
		10 -4.75 mm 19 per cent	cum	54.580	508.74	27767.03	M-040
		4.75 mm and below 44 per cent	cum	126.390	195.72	24737.05	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3069.00	26454.78	M-188
		or					
		<b>Grading - II 19 mm (Nominal Size)</b>					
		25 - 10 mm 30 per cent	cum	86.160	588.46	50701.71	M-046
		10 - 5 mm 28 per cent	cum	80.430	508.74	40917.96	M-040
		5 mm and below 40 per cent	cum	114.900	195.72	22488.23	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3069.00	26454.78	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 @ 0.1 on (a+b+c)				128865.64	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				141752.20	
		Cost for 195 cum = a+b+c+d+e				1559274.25	
		Rate per cum = (a+b+c+d+e)/195 (For Grading I)				7996.28	
					say	<u>7996.00</u>	
	(ii)	<b>For GradingII (19 mm nominal size)</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				129914.01	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				142905.41	
		Cost for 195 cum = a+b+c+d+e				1571959.53	
		Rate per cum = (a+b+c+d+e)/195 (For Grading-II)				8061.33	
					say	<u>8061.00</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.					



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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.					
5.7	508	<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 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>Unit = cum</i>					
		<i>Taking output = 195 cum (450 tonnes)</i>					
		<b>a) Labour</b>					
		Mate	day	0.840	171.00	143.64	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	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	29942.00	179652.00	P&M-022
		Paver finisher hydrostatic with sensor control @ 75 cum per hour	hour	6.000	1123.00	6738.00	P&M-035
		Generator 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	1614.00	6294.60	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		<b>c) Material</b>					
		<b>* Grading I: 13 mm (Nominal Size)</b>					
		<b>i) Bitumen@ 4.5 per cent of weight of mix</b>	tonne	20.250	48460.30	981321.08	M-074
		<b>ii) Aggregate</b>					
		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	617.12	35360.98	M-044
		10 - 5 mm 38 per cent	cum	108.870	508.74	55386.52	M-040
		5 mm and below 40 per cent	cum	114.600	195.72	22429.51	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3069.00	26454.78	M-188
		<b>or</b>					
		<b>Grading II: 10 mm (Nominal Size)</b>					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>Bitumen@5 per cent of weight of mix</b>	tonne	22.500	48460.30	1090356.75	M-074
		weight of mix = 450 tonne					
		<b>Aggregate</b>					
		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	508.74	82644.81	M-040
		4.75 and below@ 41 per cent	cum	116.850	195.72	22869.88	M-030
		<b>Filler @ 2 per cent of weight of aggregates.</b>	tonne	8.620	3069.00	26454.78	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 @ 0.1 on (a+b+c)				135248.48	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				148773.32	
		Cost for 195 cum = a+b+c+d+e				1636506.56	
		<b>Rate per cum = (a+b+c+d+e)/195 (For Grading I)</b>				8392.34	
					<i>say</i>	<u>8392.00</u>	
5.7A	(ii)	<b>for GradingII(10 mm nominal size)</b>					
		d) Overhead charges @ 0.1 on (a+b+c)				145385.81	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				159924.39	
		Cost for 195 cum = a+b+c+d+e				1759168.32	
		<b>Rate per cum = (a+b+c+d+e)/195 (For Grading-II)</b>				9021.38	
					<i>say</i>	<u>9021.00</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 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.					
5.8A	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>					
		a) Labour					
		Mate	day	0.840	171.00	143.64	L-12

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor working with HMP, mechanical broom, paver, roller, asphalt cutter and assistance for setting out lines, levels and layout of construction	day	16.000	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		<b>b) Machinery</b>					
		Batch mix HMP @ 75 tonne per hour	hour	6.000	29942.00	179652.00	P&M-022
		Paver finisher hydrostatic with mechanical control @ 75 cum per hour	hour	6.000	1123.00	6738.00	P&M-035
		Generator 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Smooth wheeled roller 8-10 tonnes for initial break down rolling.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Vibratory roller 8 tonnes for intermediate rolling.	hour	6.00x0.65*	1614.00	6294.60	P&M-059
		Finish rolling with 6-8 tonnes smooth wheeled tandem roller.	hour	6.00x0.65*	1447.00	5643.30	P&M-045
		<b>c) Material</b>					
		<b>i) Bitumen@ 5 per cent of weight of mix</b>	tonne	22.500	48460.30	1090356.75	M-074
		<b>ii) Aggregate</b>					
		Total weight of mix = 450 tonnes					
		Weight of bitumen = 22.5 tonnes					
		Weight of aggregate = 450 -22.50 = 427.50 tonnes					
		<i>Taking density of aggregate = 1.5 ton/cum</i>					
		Volume of aggregate = 285 cum					
		<b>* Grading - I-19 mm (Nominal Size)</b>					
		20 - 10 mm 35 per cent	cum	99.750	617.12	61557.72	M-045
		10 - 5 mm 23 per cent	cum	65.550	508.74	33347.91	M-040
		5 mm and below 40 per cent	cum	114.000	195.72	22312.08	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3069.00	26454.78	M-188
		or					
		<b>Grading - II-13 mm (Nominal Size)</b>					
		13.2 - 10 mm 30 per cent	cum	85.500	617.12	52763.76	M-044
		10 - 5 mm 25 per cent	cum	71.250	508.74	36247.73	M-040
		5 mm and below 43 per cent	cum	122.550	195.72	23985.49	M-030
		Filler @ 2 per cent of weight of aggregates.	tonne	8.620	3069.00	26454.78	M-188
		*Any one of the alternative may be adopted as per approved design					
	(i)	for Grading-I ( 13 mm nominal size )					
		d) Overhead charges @ 0.1 on (a+b+c)				146556.11	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				161211.72	
		Cost for 191 cum = a+b+c+d+e				1773328.96	
		Rate per cum = (a+b+c+d+e)/191				9284.44	
					say	<u>9284.00</u>	
5.8	(ii)	for Grading-II (10 mm nominal size)					
		d) Overhead charges @ 0.1 on (a+b+c)				146134.04	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				160747.44	
		Cost for 191 cum = a+b+c+d+e				1768221.87	
		Rate per cum = (a+b+c+d+e)/191 (For Grading-II)				9257.71	
					say	<u>9258.00</u>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<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 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.					
<b>5.9A</b>	<b>510</b>	<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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 9000 sqm</i>					
		<b>Case -1 :-19 mm nominal chipping size</b>					
		<b>a) Labour</b>					
		Mate	day	0.440	171.00	75.24	L-12
		Mazdoor	day	9.000	157.00	1413.00	L-13
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	422.00	3038.40	P&M-031
		Air compressor 250 cfm	hour	7.200	405.00	2916.00	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	3332.00	19992.00	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	787.00	4722.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Bitumen pressure distributor	hour	6.000	1356.00	8136.00	P&M-004
		Smooth wheeled roller 8-10 tonne weight	hour	6.000	604.00	3624.00	P&M-044
		<b>c) Material</b>					
		Bitumen@ 1.20 kg per sqm	tonne	10.800	48460.30	523371.24	M-074
		Crushed stone chipping, 19 mm nominal size @ 0.015 cum per sqm	cum	135.000	529.62	71498.70	M-053
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				64561.26	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				71017.38	
		Cost for 9000 sqm = a+b+c+d+e				781191.22	
		<b>Rate per sqm = (a+b+c+d+e)/9000</b>				86.80	
					<i>say</i>	<b><u>87.00</u></b>	
<b>5.9</b>		<b>Case - II 13 mm nominal size chipping</b>					
		<b>a) Labour</b>					
		Mate	day	0.440	171.00	75.24	L-12
		Mazdoor	day	9.000	157.00	1413.00	L-13

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor skilled	day	2.000	200.00	400.00	L-15
		<b>b) Machinery</b>					
		Mechanical broom @ 1250 sqm per hour	hour	7.200	422.00	3038.40	P&M-031
		Air compressor 250 cfm	hour	7.200	405.00	2916.00	P&M-001
		Hydraulic self propelled chip spreader @ 1500 sqm per hour	hour	6.000	3332.00	19992.00	P&M-025
		Tipper 10 tonne capacity for carriage of stone chips from stockpile on road side to chip spreader	hour	6.000	787.00	4722.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1356.00	8136.00	P&M-004
		Vibratory roller 8-10 tonne weight	hour	6.000	1614.00	9684.00	P&M-059
		<b>c) Material</b>					
		Bitumen@ 1.00 kg per sqm	tonne	9.000	48460.30	436142.70	M-074
		Crushed stone chipping, 13 mm nominal size @ 0.01 cum per sqm	cum	90.000	617.12	55540.80	M-052
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				54848.61	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				60333.48	
		Cost for 9000 sqm = a+b+c+d+e				663668.23	
		<b>Rate per sqm = (a+b+c+d+e)/9000</b>				73.74	
					<i>say</i>	<u>74.00</u>	
		<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>5.10A</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	171.00	143.64	L-12
		Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		<b>b) Machinery</b>					
		i) Batch type HMP 75 tonne per hour	hour	6.000	29942.00	179652.00	P&M-022
		ii) Electric Generator Set 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		iii) Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		iv) Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		v) Paver finisher hydrostatic with Mechanical attachment	hour	6.000	1123.00	6738.00	P&M-035
		iv) Smooth wheeled/tandem roller 8-10 tonnes weight	hour	6.000	1447.00	8682.00	P&M-045
		<b>c) Material</b>					
		Bitumen@ 14.60 kg per 10 sqm	tonne	14.970	48460.30	725450.69	M-074

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Crushed stone chipping, 13.2 mm to 5.6 mm @ 0.27 cum per 10 sqm	cum	276.750	589.97	163274.20	M-043
		d) Overhead charges @ 0.1 on (a+b+c)				111464.53	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				122610.98	
		Cost for 10250 sqm = a+b+c+d+e				1348720.79	
		Rate per sqm = (a+b+c+d+e)/10250				131.58	
					<i>say</i>	<u>132.00</u>	
		<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.					
5.11A	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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 10250 sqm (205 cum)</i>					
		<b>a) Labour</b>					
		Mate	day	0.840	171.00	143.64	L-12
		Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	157.00	2512.00	L-13
		Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
		<b>b) Machinery</b>					
		i) HMP of appropriate capacity - 75 t per hour	hour	6.000	29942.00	179652.00	P&M-022
		ii) Electric Generator Set 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		iii) Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		iv) Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		v) Paver finisher hydrostatic with Mechanical attachment	hour	6.000	1123.00	6738.00	P&M-035
		iv) Smooth wheeled 8-10 tonnes weight	hour	6.000	604.00	3624.00	P&M-044
		<b>c) Material</b>					
		<b>Type - A</b>					
		* Bitumen @ 22 kg per 10 sqm	tonne	22.500	48460.30	1090356.75	M-074
		Stone crushed aggregates 11.2 mm to 0.09 @ 0.27 cum per 10 sqm	cum	276.750	333.95	92420.66	M-041
		<b>or</b>					
		<b>Type - B</b>					
		Bitumen @ 19 kg per 10 sqm	tonne	19.480	48460.30	944006.64	M-074
		Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	276.750	452.61	125259.82	M-042
		d) Overhead charges @ 0.1 on (a+b+c)				140363.98	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Contractor's profit @ 0.1 on (a+b+c+d)				154400.38	
		Cost for 10250 sqm = a+b+c+d+e				1698404.16	
		Rate per sqm = (a+b+c+d+e)/10250				165.70	
		For Type 'A'			say	<u>166.00</u>	
		For Type 'B'			say	<u>154.00</u>	
		* Any one of the alternative may be adopted					
5.12A	513	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 A and B seal coats					
		<i>Unit = sqm</i>					
		<i>Taking output = 10250 sqm (92.25 cum)</i>					
	(i)	Case - I : Type A					
		a) Labour					
		Mate	day	0.240	171.00	41.04	L-12
		Mazdoor	day	6.000	157.00	942.00	L-13
		b) Machinery					
		Hydraulic self propelled chip spreader	hour	6.000	3332.00	19992.00	P&M-025
		Tipper 5.5 cum capacity	hour	6.000	787.00	4722.00	P&M-048
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Bitumen pressure distributor @ 1750 sqm per hour	hour	6.000	1356.00	8136.00	P&M-004
		Smooth wheeled roller 8 -10 tonne weight	hour	6.000	604.00	3624.00	P&M-044
		c) Material					
		Bitumen@ 9.80 kg per 10 sqm	tonne	10.050	48460.30	487026.02	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	394.20	36364.95	M-050
		d) Overhead charges @ 0.1 on (a+b+c)				56727.40	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				62400.14	
		Cost for 10250 sqm = a+b+c+d+e				686401.55	
		Rate per sqm = (a+b+c+d+e)/10250				66.97	
					say	<u>67.00</u>	
	Note	Since seal coat is provided immediately over the bituminous layers, mechanical broom for clearing has not been catered.					
5.12A	(ii)	Case - II : Type 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>Unit = sqm</i>					
		<i>Taking output = 7858 sqm (47.16 cum)</i>					
		a) Labour					
		Mate	day	0.160	171.00	27.36	L-12
		Mazdoor	day	4.000	157.00	628.00	L-13
		b) Machinery					
		HMP of 75 tonnes/hour.	hour	2.000	29942.00	59884.00	P&M-022
		Electric Generator Set 250 KVA	hour	2.000	2896.00	5792.00	P&M-081
		Front end loader 1 cum bucket capacity	hour	2.000	1071.00	2142.00	P&M-017
		Tipper 10 tonne capacity	tonne.km	104 x 'L'	6.85	712.40	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				71.24	
		Paver finisher hydrostatic with Mechanical attachment	hour	2.000	1123.00	2246.00	P&M-035
		Smooth wheeled 8-10 tonnes capacity	hour	2.000	604.00	1208.00	P&M-044
		c) Material					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Bitumen@ 6.80 kg per 10 sqm	tonne	5.340	48460.30	258778.00	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	394.20	18590.47	M-050
		d) Overhead charges @ 0.1 on (a+b+c)				35007.95	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				38508.74	
		Cost for 7858 sqm = a+b+c+d+e				423596.16	
		Rate per sqm = (a+b+c+d+e)/7858				53.91	
					<i>say</i>	<u>54.00</u>	
		<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.					
5.22A	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					
		<i>Unit = cum</i>					
		<i>Taking output = 205 cum (450 tonnes)</i>					
		Case(i) 75 mm thickness					
		a) Labour					
		Mate	day	1.000	171.00	171.00	L-12
		Mazdoor	day	12.000	157.00	1884.00	L-13
		Mazdoor skilled	day	5.000	200.00	1000.00	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	3136.00	18816.00	P&M-064
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1071.00	6426.00	P&M-017
		Paver finisher hydrostatic with Mechanical control @ 75 cum per hour	hour	6.000	1123.00	6738.00	P&M-035
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1573.00	6134.70	P&M-037
		Smooth wheeled steel roller 6-8 tonnes.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Water tanker 6 KL capacity	hour	1.000	154.00	154.00	P&M-060
		c) Material					
		Bitumen emulsion @ 45 litres per tonne	tonne	20.250	43116.00	873099.00	M-077
		Crushed stone aggregates 40 mm nominal size	cum	297.000	425.02	126230.94	M-055
		Cost of water	KL	6.000	225.00	1350.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				106012.20	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				116613.42	
		Cost for 205 sqm = a+b+c+d+e				1282747.61	
		Rate per sqm = (a+b+c+d+e)/205				6257.31	
					<i>say</i>	<u>6257.00</u>	
		<b>Note</b>					
		(Case I to III)					
		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.					



## Analysis of Rate






Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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.					
5.22A	Case(ii)	40 mm thickness					
		a) Labour					
		Mate	day	1.000	171.00	171.00	L-12
		Mazdoor	day	12.000	157.00	1884.00	L-13
		Mazdoor skilled	day	5.000	200.00	1000.00	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	3136.00	18816.00	P&M-064
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1071.00	6426.00	P&M-017
		Paver finisher hydrostatic with Mechanical control @ 75 cum per hour	hour	6.000	1123.00	6738.00	P&M-035
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Pneumatic tyred roller 12-15 tonnes.	hour	6.00x0.65*	1573.00	6134.70	P&M-037
		Smooth wheeled steel roller 6-8 tonnes.	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Water tanker 6 KL capacity	hour	1.000	154.00	154.00	P&M-060
		c) Material					
		Bitumen emulsion @ 70 litres per tonne	tonne	31.500	43116.00	1358154.00	M-077
		Crushed stone aggregates 14 mm nominal size	cum	287.000	617.12	177113.44	M-052
		Cost of water	KL	6.000	225.00	1350.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				159605.95	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				175566.54	
		Cost for 205 sqm = a+b+c+d+e				1931231.98	
		Rate per sqm = (a+b+c+d+e)/205				9420.64	
					<b>say</b>	<b><u>9421.00</u></b>	
5.22A	Case(iii)	25 mm thickness					
		a) Labour					
		Mate	day	1.000	171.00	171.00	L-12
		Mazdoor	day	12.000	157.00	1884.00	L-13
		Mazdoor skilled	day	5.000	200.00	1000.00	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	3136.00	18816.00	P&M-064
		Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
		Front end loader 1 cum capacity	hour	6.000	1071.00	6426.00	P&M-017
		Paver finisher hydrostatic with Mechanical control @ 75 cum per hour	hour	6.000	1123.00	6738.00	P&M-035
		Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
		Pneumatic tyred roller	hour	6.00x0.65*	1573.00	6134.70	P&M-037
		Smooth wheeled steel roller	hour	6.00x0.65*	604.00	2355.60	P&M-044
		Water tanker 6 KL capacity	hour	1.000	154.00	154.00	P&M-060
		c) Material					
		Bitumen emulsion @ 85 litres per tonne	tonne	38.250	43116.00	1649187.00	M-077
		Crushed stone aggregates 6 mm nominal size	cum	270.000	394.20	106434.00	M-050
		Cost of water	KL	6.000	225.00	1350.00	M-189

### Analysis of Rate






















Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 0.1 on (a+b+c)				181641.31	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				199805.44	
		Cost for 205 sqm = a+b+c+d+e				2197859.79	
		Rate per sqm = (a+b+c+d+e)/205				10721.27	
					<i>say</i>	<b><u>10721.00</u></b>	

### Summary of Rate Analysis

CHAPTER-5B			
<b>BASES AND SURFACE COURSES (BITUMINOUS)</b>			
<b>(With mechanical paver and 40-60 TPH, HMP)</b>			
Item No.	Descriptions	Unit	Rate (in Rs.)
5.3B	<b>BITUMINOUS MACADAM</b>		
	Providing and laying bituminous macadam with hot mix plant 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)	<b>BITUMINOUS (80/100 grade)</b>	cum	6756.78
(ii)	<b>BITUMINOUS (60/70 grade)</b>	cum	63709.31
5.9B	<b>20mm 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 as per Technical Specification Clause 508.		
Case - I	<b>BITUMINOUS (80/100 grade)</b>	sqm	145.58
Case - II	<b>BITUMINOUS (60/70 grade)</b>	sqm	147.20
5.11B	<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 (TypeA) 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		
i) For Type A	<b>BITUMINOUS (80/100 grade)</b>	sqm	179.00
	<b>BITUMINOUS (60/70 grade)</b>		182.21
i) For Type B	<b>BITUMINOUS (80/100 grade)</b>		166.48
	<b>BITUMINOUS (60/70 grade)</b>	sqm	168.50
5.12B	<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 as per Technical Specification Clause 510		
	<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.)		
	<b>BITUMINOUS (80/100 grade)</b>	sqm	51.23
	<b>BITUMINOUS (60/70 grade)</b>	sqm	51.99

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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.

### **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.

## Summary of Rate Analysis

### CHAPTER-6 CEMENT CONCRETE PAVEMENTS

Item No.	Descriptions	Unit	Rate (in Rs.)
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	1909.00
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	4788.00
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	2241.00
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	1699.00
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	4418.00

**Analysis of Rate**

**CHAPTER- 6  
CEMENT CONCRETE PAVEMENTS**

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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.					
		<i>Unit = cum</i>					
		<i>Taking output = 450 cum (990 tonne)</i>					
		<b>a) Labour</b>					
		Mate	day	1.120	171.00	191.52	L-12
		Mazdoor skilled	day	6.000	200.00	1200.00	L-15
		Mazdoor	day	22.000	157.00	3454.00	L-13
		<b>b) Machinery</b>					
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	2822.00	16932.00	P&M-068
		Electric generator 100 KVA	hour	6.000	1532.00	9192.00	P&M-080
		Paver with electronic sensor	hour	6.000	2889.00	17334.00	P&M-034
		Vibratory roller 8-10 t capacity	hour	8.000	1614.00	12912.00	P&M-059
		Water tanker 6 KL capacity	hour	8.000	154.00	1232.00	P&M-060
		Tipper	tonne.km	990 x L	6.85	6781.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				678.15	
		<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	561.00	227205.00	M-052 and M-054
		Coarse Sand as per IS: 383 @ 0.45 cum/cum of concrete	cum	203.000	133.28	27055.84	M-004
		Cement @ 150 kg/cum of concrete	tonne	67.500	5462.00	368685.00	M-081
		Cost of water	KL	48.000	225.00	10800.00	M-189
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				71007.90	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				78108.69	
		Cost for 450 cum = a+b+c+d+e				859195.60	
		Rate per cum = (a+b+c+d+e)/450				1909.32	
					<i>say</i>	<b>1909.00</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					
		<i>Unit = cum</i>					
		<i>Taking output = 1050 cum (2415 tonne)</i>					
		<b>a) Labour</b>					
		Mate	day	2.000	171.00	342.00	L-12

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		Mazdoor skilled	day	15.000	200.00	3000.00	L-15	
		Mazdoor	day	35.000	157.00	5495.00	L-13	
		<b>b) Machinery</b>						
		Road Sweeper @ 1250 sqm per hour	hour	2.800	422.00	1181.60	P&M-031	
		Front end loader 1 cum bucket capacity	hour	18.000	1071.00	19278.00	P&M-017	
		Cement concrete batch mix plant @ 175 cum per hour (effective output)	hour	6.000	6584.00	39504.00	P&M-067	
		Electric generator 250 KVA	hour	6.000	2896.00	17376.00	P&M-081	
		Slip form paver with electronic sensor	hour	6.000	1236.00	7416.00	P&M-006	
		Water tanker 6 KL capacity	hour	36.000	154.00	5544.00	P&M-060	
		Transit truck agitator 5 cum capacity.	tonne.km	2415xL	6.00	14490.00	Lead =1 km & P&M-050	
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				1449.00		
		Concrete joint cutting machine .	hour	12.000	295.00	3540.00	P&M-083	
		Texturing machine .	hour	12.000	99.00	1188.00	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	561.00	530145.00	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	133.28	63041.44	M-004	
		Cement 43 grade @ 400 kg/cum of concrete	tonne	414.000	5462.00	2261268.00	M-081	
		32 mm mild steel dowel bars of grade S 240	tonne	9.450	43971.42	415529.92	M-126	
		16 mm deformed steel tie bars of grade S 415	tonne	1.170	42812.50	50090.63	M-082	
		Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	3675.000	15.00	55125.00	M-164	
		Pre moulded Joint filler, 25 mm thick for expansion joint.	sqm	16.330	937.50	15309.38	M-141	
		Joint sealant	kg	875.000	24.00	21000.00	M-120	
		Sealant primer	kg	116.670	12.00	1400.04	M-097	
		Plastic sheath, 1.25 mm thick for dowel bars	sqm	46.670	15.00	700.05	M-138	
		Curing compound	liter	1850.000	120.00	222000.00	M-090	
		Super plastisizer admixture IS marked as per 9103-1999 @ 0.5 per cent by weight of cement	kg	2070.000	150.00	310500.00	M-180	
		Cost of water	KL	216.000	225.00	48600.00	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.				39947.09		
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				415446.01		
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				456990.62		
		Cost for 1050cum = a+b+c+d+e				5026896.77		
		<b>Rate per cum = (a+b+c+d+e)/1050</b>				4787.52		
					<i>say</i>	<b>4788.00</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>						

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		<i>Taking output = 450 cum (990 tonne)</i>						
		<b>a) Labour</b>						
		Mate	day	1.200	171.00	205.20	L-12	
		Mazdoor skilled	day	7.000	200.00	1400.00	L-15	
		Mazdoor	day	23.000	157.00	3611.00	L-13	
		<b>b) Machinery</b>						
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017	
		Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	2822.00	16932.00	P&M-068	
		Electric generator 100 KVA	hour	6.000	1532.00	9192.00	P&M-080	
		Paver with electronic sensor @ 75 cum/hr.	hour	6.000	2889.00	17334.00	P&M-034	
		Vibratory roller 8-10 t capacity	hour	8.000	1614.00	12912.00	P&M-059	
		Water tanker with 5 km lead 6 KL capacity	hour	8.000	154.00	1232.00	P&M-060	
		Tipper	tonne.km	990xL	6.85	6781.50	Lead =1 km & P&M-047	
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				678.15		
		<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	561.00	227205.00	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	133.28	27055.84	M-004	
		Cement @ 200 kg/cum of concrete	tonne	90.000	5462.00	491580.00	M-081	
		Cost of water	KL	48.000	225.00	10800.00	M-189	
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				83334.47		
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				91667.92		
		Cost for 450cum = a+b+c+d+e				1008347.07		
		<b>Rate per cum = (a+b+c+d+e)/450</b>				2240.77		
					<i>say</i>	<u><b>2241.00</b></u>		
		<i>Note</i>	The quantities for cement, coarse aggregate and fine aggregates are for estimating only .The exact quantities will be as per mix design.					
6.4	<i>New</i>	<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	<i>Suggestive</i>	<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.						
		<i>Unit = cum</i>						

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<i>Taking output = 450 cum (990 tonne)</i>					
		<b>a) Labour</b>					
		Mate	day	1.120	171.00	191.52	L-12
		Mazdoor skilled	day	6.000	200.00	1200.00	L-15
		Mazdoor	day	22.000	157.00	3454.00	L-13
		<b>b) Machinery</b>					
		Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
		Cement concrete batch mix plant @ 75 cum per hour	hour	6.000	2822.00	16932.00	P&M-068
		Electric generator 100 KVA	hour	6.000	1532.00	9192.00	P&M-080
		Paver finisher with electronic sensor	hour	6.000	2889.00	17334.00	P&M-034
		Vibratory roller 8-10 t capacity	hour	8.000	1614.00	12912.00	P&M-059
		Water tanker 6 KL capacity	hour	8.000	154.00	1232.00	P&M-060
		Tipper 10 T Capacity	tonne.km	990 x L	6.85	6781.50	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				678.15	
		<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	425.02	172133.10	M-055
		Coarse Sand as per IS: 383 - 1970	cum	110.960	133.28	14788.75	M-004
		Cement @ 150 kg/cum of concrete	tonne	67.500	5462.00	368685.00	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 @ 0.1 on (a+b+c)</b>				63194.00	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				69513.40	
		Cost for 450cum = a+b+c+d+e				764647.42	
		<b>Rate per cum = (a+b+c+d+e)/450</b>				1699.22	
					<i>say</i>	<u>1699.00</u>	
		<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.					
6.6	<i>Suggestive</i>	<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					
		<i>Unit = cum</i>					
		<i>Taking output = 1050 cum (2415 tonne)</i>					
		<b>a) Labour</b>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate	day	2.000	171.00	342.00	L-12
		Mazdoor skilled	day	15.000	200.00	3000.00	L-15
		Mazdoor	day	35.000	157.00	5495.00	L-13
		<b>b) Machinery</b>					
		Road Sweeper @ 1250 sqm per hour	hour	2.800	422.00	1181.60	P&M-031
		Front end loader 1 cum bucket capacity	hour	18.000	1071.00	19278.00	P&M-017
		Cement concrete batch mix plant @ 175 cum per hour (effective output)	hour	6.000	6584.00	39504.00	P&M-067
		Electric generator 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
		Slip form paver with electronic sensor	hour	6.000	1236.00	7416.00	P&M-006
		Water tanker 6 KL capacity	hour	36.000	154.00	5544.00	P&M-060
		Transit truck agitator 5 cum capacity.	tonne.km	2415xL	6.00	14490.00	P&M-050 Lead= 1 km
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				1449.00	
		Concrete joint cutting machine .	hour	12.000	295.00	3540.00	P&M-083
		Texturing machine .	hour	12.000	99.00	1188.00	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	561.00	530145.00	M-052 and M-054
		Sand as per IS: 383 and conforming to clause 602.2.4	cum	425.000	133.28	56644.00	M-004
		Cement 43 grade	tonne	357.000	5462.00	1949934.00	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	43971.42	415529.92	M-126
		16 mm deformed steel tie bars of grade S 415	tonne	1.170	42812.50	50090.63	M-082
		Separation Membrane of impermeable plastic sheeting 125 micron thick	sqm	3675.000	15.00	55125.00	M-164
		Pre moulded Joint filler, 25 mm thick for expansion joint	sqm	16.330	937.50	15309.38	M-141
		Joint sealant	kg	875.000	24.00	21000.00	M-120
		Sealant primer	kg	116.670	12.00	1400.04	M-097
		Plastic sheath, 1.25 mm thick for dowel bars	sqm	46.670	15.00	700.05	M-138
		Curing compound	liter	1850.000	120.00	222000.00	M-090
		Super plastisizer admixture IS marked as per 9103-1999 @ 0.5 per cent by weight of cement	kg	2070.000	150.00	310500.00	M-180
		Cost of water	KL	216.000	225.00	48600.00	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.				36769.78	
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				383355.14	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				421690.65	
		Cost for 1050cum = a+b+c+d+e				4638597.18	
		<b>Rate per cum = (a+b+c+d+e)/1050</b>				4417.71	
					<b>say</b>	<b><u>4418.00</u></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.					
		*Calculation of cement, sand and fly ash.					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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>					



## 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.

## Summary of Rate Analysis

### CHAPTER-7 GEOSYNTHETICS AND REINFORCED EARTH

Item No.	Descriptions	Unit	Rate (in Rs.)
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	320.00
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	998.00

## Analysis of Rate

### CHAPTER-7 GEOSYNTHETICS AND REINFORCED EARTH

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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 planer 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	171.00	6.84	L-12
		Mazdoor skilled	day	0.250	200.00	50.00	L-15
		Mazdoor	day	0.500	157.00	78.50	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	103.13	103.13	M-107
		Geomembrane	sqm	1.000	input	#VALUE!	M-106
		Geotextile	sqm	2.000	80.63	161.26	M-108
		Add 2 per cent cost of material for miscellaneous items like synthetic cord				#VALUE!	
		<b>c) Overhead charges @ 0.1 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	171.00	6.84	L-12
		Mazdoor skilled	day	0.250	200.00	50.00	L-15
		Mazdoor	day	0.500	157.00	78.50	L-13
		<b>b) Material</b>					
		Perforated geosynthetic pipe 150 mm dia	metre	1.000	25.58	25.58	M-134
		Geotextile filter fabric	sqm	1.250	80.63	100.79	M-109
		Add 2 per cent cost of material for miscellaneous item like synthetic cord				2.53	
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				26.42	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				29.07	
		<b>Rate per metre = a+b+c+d</b>				319.72	
					say	320.00	
		<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>					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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					
		<b>Unit = sqm</b>					
		<b>Taking output = 2800 sqm</b>					
		<b>a) Labour</b>					
		Mate	day	0.800	171.00	136.80	L-12
		Mazdoor	day	20.000	157.00	3140.00	L-13
		<b>b) Machinery</b>					
		Road sweeper 1250 sqm per hour	hour	2.240	422.00	945.28	P&M-031
		Pneumatic roller 14 tonnes 2000 sqm per hour	hour	1.400	1573.00	2202.20	P&M-037
		Bitumen pressure distributor 1750 sqm per hour	hour	1.680	1356.00	2278.08	P&M-004
		<b>c) Material</b>					
		Paving Fabric	sqm	2940.000	input	#VALUE!	M-133
		Paving Bitumen 80-100	tonne	2.800	47544.90	133125.72	M-075
		<b>c) Overhead charges @ 0.1 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!	
					<b>say</b>	<b>#VALUE!</b>	
7.4	704	Laying Boulder Apron in Crates of Synthetic Geogrids					
		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	171.00	10.26	L-12
		Mazdoor skilled	day	0.500	200.00	100.00	L-15
		Mazdoor	day	1.500	157.00	235.50	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	294.26	1015.20	M-003
		Stones spall for filling voids	cum	0.450	294.26	132.42	M-008
		<b>c) Overhead charges @ 0.1 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!	
					<b>say</b>	<b>#VALUE!</b>	
7.5	3100	Reinforced Earth Structures					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
			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.					
			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.					
			<i>Unit = Running Metre</i>					
			<i>Taking Output = 450 m</i>					
			a) Labour					
			Mate	day	0.360	171.00	61.56	L-12
			Mazdoor	day	6.000	157.00	942.00	L-13
			Mazdoor skilled	day	3.000	200.00	600.00	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 facia pannels, overlaps, heat bonding or extension.					
		Type 1	1.Galvanised carbon steel strips					
			c) Overhead charges @ 0.1 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 @ 0.1 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 @ 0.1 on (a+b)				#VALUE!	
			d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost of 450 m = a+b+c+d				#VALUE!	
		Rate per metre =(a+b+c+d)/450				#VALUE!	
					say	<u>#VALUE!</u>	
	Type 4	4.Stainless steel strips					
		c) Overhead charges @ 0.1 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	<u>#VALUE!</u>	
	Type 5	5.Glass reinforced polymer/fibre reinforced polymer/polymeric strips					
		c) Overhead charges @ 0.1 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	<u>#VALUE!</u>	
7.5(i)	B	With reinforcing elements of synthetic geogrids					
		<i>Unit = sqm</i>					
		<i>Taking output = 300 sqm</i>					
		a) Labour					
		Mate	day	0.360	171.00	61.56	L-12
		Mazdoor	day	6.000	157.00	942.00	L-13
		Mazdoor skilled	day	3.000	200.00	600.00	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 facia pannels, overlaps and other protective elements for synthetic geogrids.				#VALUE!	
		c) Overhead charges @ 0.1 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	<u>#VALUE!</u>	
7.5	3104	(ii) Facing elements of RCC					
		<i>Unit = sqm</i>					
		<i>Taking output = 75 sqm</i>					
		a) Labour					
		Mate	day	0.180	171.00	30.78	L-12
		Mazdoor	day	3.000	157.00	471.00	L-13
		Mazdoor skilled	day	1.500	200.00	300.00	L-15
		b) Machinery					
		Light crane with lifting capacity upto 3 tonne	hour	6.000	452.00	2712.00	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	3315.00	44752.50	Item 12.8 (H) Case I
		HYS steel @ 5 kg / sqm (Refer Item 12.6)	tonnes	0.380	64324.00	24443.12	Item 13.6
		Add 2 per cent of cost of facia pannels, for all necessary temporary form work, scaffolding and provision of loops/lugs for lifting of pannels and joining the reinforcing elements.				1383.91	
		d) Overhead charges @ 0.1 on (a+b)				351.38	
		e) Contractor's profit @ 0.1 on (a+b+d)				386.52	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 75 sqm = a+b+c+d+e				74831.21	
		Rate per sqm = (a+b+c+d+e)/ 75				997.75	
					<i>say</i>	<u>998.00</u>	
	<b>Note</b>	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.					
		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.					

## Summary of Rate Analysis

### CHAPTER-8 TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Item No.	Descriptions	Unit	Rate (in Rs.)
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)		
<b>A</b>	<b>Using Concrete Mixer</b>	metre	194.00
<b>B</b>	<b>Using Concrete Batching and Mixing Plant</b>	metre	207.00
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)		
<b>A</b>	<b>Using Concrete Mixer</b>	metre	348.00
<b>B</b>	<b>Using Concrete Batching and Mixing Plant</b>	metre	370.00
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	0.55
(ii)	<b>English and Roman</b>	cm height per letter	0.34
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	5169.00
( ii )	<b>60 cm equilateral triangle</b>	each	3197.00
( iii )	<b>60 cm circular</b>	each	4488.00
( iv )	<b>80 mm x 60 mm rectangular</b>	each	6490.00
( v )	<b>60 cm x 45 cm rectangular</b>	each	4356.00
(vi)	<b>60 cm x 60 cm square</b>	each	5270.00
( vii )	<b>90 cm high octagon</b>	each	8442.00
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 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	12153.00
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	12489.00
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)		
<b>A</b>	<b>Truss and Vertical Support</b>	tonne	56564.00
<b>B</b>	<b>Aluminium alloy plate for over head sign</b>	tonne	10949.00
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	57.00
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	50.00
8.10	<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	57.00



## Summary of Rate Analysis

8.11	<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	84.00
(ii)	<b>Up to 10 cm in width</b>	sqm	75.00
8.12	<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	56.00
(ii)	<b>Up to 10 cm in width</b>	sqm	59.00
8.13	<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	771.00
8.14	<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	2719.00
(ii)	<b>Ordinary Kilometer stone (Precast)</b>	each	1601.00
(iii)	<b>Hectometer stone (Precast)</b>	each	483.00
8.15	<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	1037.00
8.16	<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	398.00
8.17	<b>G.I Barbed wire Fencing 1.2 metre high</b> (Providing and fixing 1.2 metres high G.I 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 G.I staples, turn buckles etc complete as per clause 807 )	metre	236.00
8.18	<b>G.I Barbed wire Fencing 1.8 metre high</b> (Providing and fixing 1.8 metres high G.I 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 G.I staples, turn buckles etc complete as per clause 807 )	metre	395.00
8.19	<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	515.00
8.20	<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	1720.00
8.21	<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	1262.00
8.22	<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	2930.00

## Summary of Rate Analysis

<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 fitments 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	2679.00
<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 fitments 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	3459.00
<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	1932.00
<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	3143.00
<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	823.00
<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	962.00
<b>(ii)</b>	<b>Double Row for two utility services</b>	metre	1776.00
<b>(iii)</b>	<b>Triple Row for three utility services</b>	metre	2601.00

## Summary of Rate Analysis

8.30	<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	54665.00
(ii)	<b>Message Display</b> (Message display board 6 sqm electronically operated with complete electronic fitments 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	816.00
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	551.00
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	224.00
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	-

## Summary of Rate Analysis

<b>8.40</b>	<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.)		-
<b>8.41</b>	<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:-)		-
<b>8.42</b>	<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>8.43</b>	<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	2593.00
<b>8.44</b>	<b>Permanent Type Barricade in Construction Zone</b>		
<b>A</b>	<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 stripes, 150 mm in width at an angle of 45 deg., complete as per IRC:SP:55-2001 )	each	4129.00
<b>B</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	9508.00
<b>C</b>	<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)	each	14143.00
<b>8.45</b>	<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	389.00
<b>8.46</b>	<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	289.00

## Analysis of Rate

### CHAPTER-8 TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.1	408	Cast in Situ Cement Concrete M20 Kerb					
		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					
		<i>Unit = Running metre</i>					
		<i>Taking output = 360 metre</i>					
	A.	Using Concrete Mixer					
		Cement Concrete					
		Cement concrete of grade M20 = 12.60 cum					
		Cement concrete of grade M10 for base = 11.61 cum					
		Total Concrete = 24.21 cu.m					
		a) Labour					
		Mate	day	0.720	171.00	123.12	L-12
		Mason	day	2.000	213.00	426.00	L-11
		Mazdoor	day	16.000	157.00	2512.00	L-13
		b) Machinery					
		Kerb casting machine @ 60 metres/hour	hour	6.000	392.00	2352.00	P&M-029
		Concrete mixer 0.48/0.28 cum capacity	hour	12.000	58.00	696.00	P&M-009
		Water tanker 6 KL capacity	hour	5.000	154.00	770.00	P&M-060
		c) Material					
		Crushed stone aggregate 20 mm nominal size 59 per cent	cum	21.790	529.62	11540.42	M-053
		Coarse sand 30 per cent	cum	10.900	133.28	1452.75	M-005
		Cement 11 per cent	tonne	5.700	5462.00	31133.40	M-081
		Cost of water	KL	30.000	225.00	6750.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				5775.57	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6353.13	
		Cost for 360 meter = a+b+c+d+e				69884.39	
		Rate per metre = (a+b+c+d+e)/360				194.12	
					<i>say</i>	<u>194.00</u>	
	B	Using Concrete Batching and Mixing Plant					
		Cement Concrete					
		Cement concrete of grade M20 = 12.60 cum					
		Cement concrete of grade M10 for base = 11.61 cum					
		Total Concrete = 24.21 cu.m					
		a) Labour					
		Mate	day	0.120	171.00	20.52	L-12
		Mason	day	1.000	213.00	213.00	L-11
		Mazdoor	day	2.000	157.00	314.00	L-13
		b) Machinery					
		Kerb casting machine @ 60 metres/hour	hour	6.000	392.00	2352.00	P&M-029
		Concrete batching and mixing plant @ 15 cum/hr.	hour	1.600	1511.00	2417.60	P&M-003
		Water tanker 6 KL capacity	hour	5.000	154.00	770.00	P&M-060
		Tipper 5.5 cum capacity	hour	6.000	787.00	4722.00	P&M-048
		c) Material					
		Crushed stone aggregate 20 mm nominal size 59 per cent	cum	21.790	529.62	11540.42	M-053
		Coarse sand 30 per cent	cum	10.900	133.28	1452.75	M-004
		Cement 11 per cent	tonne	5.700	5462.00	31133.40	M-081
		Cost of water	KL	30.000	225.00	6750.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				6168.57	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6785.43	
		Cost for 360 meter = a+b+c+d+e				74639.69	
		Rate per metre = (a+b+c+d+e)/360				207.33	
					<i>say</i>	<u>207.00</u>	
8.2	408	Cast in Situ Cement Concrete M 20 Kerb with Channel					
		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					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>A</b>					
		Using Concrete Mixer					
		<i>Unit = Running metre</i>					
		<i>Taking output = 300 metre length</i>					
		Cement Concrete					
		Cement concrete of grade M20= 17.48 cum					
		Cement concrete of grade M10 for base = 23.18 cum					
		Total Concrete = 40.66 cum					
		<b>a) Labour</b>					
		Mate	day	0.720	171.00	123.12	L-12
		Mason	day	2.000	213.00	426.00	L-11
		Mazdoor	day	16.000	157.00	2512.00	L-13
		<b>b) Machinery</b>					
		Kerb casting machine @ 50 metres/hour for laying kerb and channel	hour	6.000	392.00	2352.00	P&M-029
		Concrete mixer 0.48/0.28	hour	16.000	58.00	928.00	P&M-009
		Water tanker 6 KL capacity	hour	6.000	154.00	924.00	P&M-060
		<b>c) Material</b>					
		Crushed stone aggregate 20 mm nominal size 60 per cent	cum	36.590	529.62	19378.80	M-053
		Coarse sand 30 per cent	cum	18.300	133.28	2439.02	M-005
		Cement 10 per cent	tonne	9.010	5462.00	49212.62	M-081
		Cost of water	KL	36.000	225.00	8100.00	M-189
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				8639.56	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				9503.51	
		Cost for 300 metre = a+b+c+d+e				104538.63	
		Rate per metre = (a+b+c+d+e)/300				348.46	
					<i>say</i>	<u>348.00</u>	
8.2		<b>B</b>					
		Using Concrete Batching and Mixing Plant					
		<i>Unit = Running metre</i>					
		<i>Taking output = 300 metre length</i>					
		Cement Concrete					
		Cement concrete of grade M20= 17.48 cum					
		Cement concrete of grade M10 for base = 23.18 cum					
		Total Concrete = 40.66 cum					
		<b>a) Labour</b>					
		Mate	day	0.120	171.00	20.52	L-12
		Mason	day	1.000	213.00	213.00	L-11
		Mazdoor	day	2.000	157.00	314.00	L-13
		<b>b) Machinery</b>					
		Kerb casting machine @ 50 metres/hour for laying kerb and channel	hour	6.000	392.00	2352.00	P&M-029
		Concrete batching and mixing plant @ 15 cum/hr.	hour	2.700	1511.00	4079.70	P&M-003
		Water tanker 6 KL capacity	hour	6.000	154.00	924.00	P&M-060
		Tipper of 5.5 cum capacity	hour	6.000	787.00	4722.00	P&M-048
		<b>c) Material</b>					
		Crushed stone aggregate 20 mm nominal size 60 per cent	cum	36.590	529.62	19378.80	M-053
		Coarse sand 30 per cent	cum	18.300	133.28	2439.02	M-004
		Cement 10 per cent	tonne	9.010	5462.00	49212.62	M-081
		Cost of water	KL	36.000	225.00	8100.00	M-189
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				9175.57	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				10093.12	
		Cost for 300 meter = a+b+c+d+e				111024.35	
		Rate per metre = (a+b+c+d+e)/300				370.08	
					<i>say</i>	<u>370.00</u>	
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					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	(i)	Hindi ( Matras commas and the like not to be measured and paid for Half letter shall be counted as half )					
		<i>Details for 100 letters of 16 cm height i.e. 1600 cm</i>					
		<i>Unit = per cm height per letter</i>					
		a) Labour					
		Mate	day	0.120	171.00	20.52	L-12
		Painter	day	2.000	201.00	402.00	L-18
		Mazdoor	day	1.000	157.00	157.00	L-13
		b) Material					
		Paint	Litre	0.700	217.80	152.46	M-131
		c) Overhead charges @ 0.1 on (a+b)				73.20	
		d) Contractor's profit @ 0.1 on (a+b+c)				80.52	
		Cost for 1600 cm = a+b+c+d				885.70	
		Rate per cm height per letter = (a+b+c+ d)/1600				0.55	
					<i>say</i>	<u>0.55</u>	
8.3	(ii)	English and Roman					
		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					
		a) Labour					
		Mate	day	0.070	171.00	11.97	L-12
		Painter Ist class	day	1.250	201.00	251.25	L-18
		Mazdoor	day	0.500	157.00	78.50	L-13
		b) Material					
		Paint	Litre	0.500	217.80	108.90	M-131
		c) Overhead charges @ 0.1 on (a+b)				45.06	
		d) Contractor's profit @ 0.1 on (a+b+c)				49.57	
		Cost for 1600 cm = a+b+c+d				545.25	
		Rate per cm height per letter = (a+b+c +d)/1600				0.34	
					<i>say</i>	<u>0.34</u>	
8.4	801	Retro-Reflectorised Traffic Signs					
		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					
		<i>Unit = Each</i>					
		<i>Taking output = one traffic sign</i>					
		i) Excavation for foundation	cum	0.216	159.00	34.34	Item No. 3.13 A
		ii) Cement concrete M15 grade	cum	0.120	3733.00	447.96	Item 12.8 (A)
		iii) Painting angle iron post two coats	sqm	0.430	50.00	21.50	Item 8.9
		a) Labour (For fixing at site)					
		Mate	day	0.010	171.00	1.71	L-12
		Mazdoor	day	0.250	157.00	39.25	L-13
		b) Material					
		Mild steel angle iron 75 x 75 x 6 mm	kg	19.000	44.879	852.708	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.				17.05	
	(i)	90 cm equilateral triangle	sqm	0.350	8400.00	2940.00	M-061
		or					
	(ii)	60 cm equilateral triangle	sqm	0.156	8400.00	1310.40	M-061
		or					
	(iii)	60 cm circular	sqm	0.283	8400.00	2377.20	M-061

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		or					
	(iv)	80 mm x 60 mm rectangular	sqm	0.480	8400.00	4032.00	M-061
		or					
	(v)	60 cm x 45 cm rectangular	sqm	0.270	8400.00	2268.00	M-061
		or					
	(vi)	60 cm x 60 cm square	sqm	0.360	8400.00	3024.00	M-061
		or					
	(vii)	90 cm high octagon	sqm	0.672	8400.00	5644.80	M-061
		c) Machinery					
		Tractor-trolley	hour	0.010	459.00	4.59	P&M-053
	(i)	90 cm equilateral triangle					
		d) Overhead charges @ 0.1 on (a+b+c)				385.53	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				424.08	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				5168.73	
					say	<u>5169.00</u>	
	(ii)	60 cm equilateral triangle					
		d) Overhead charges @ 0.1 on (a+b+c)				222.57	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				244.83	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				3196.91	
					say	<u>3197.00</u>	
	(iii)	60 cm circular					
		d) Overhead charges @ 0.1 on (a+b+c)				329.25	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				362.18	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				4487.74	
					say	<u>4488.00</u>	
	(iv)	80 mm x 60 mm rectangular					
		d) Overhead charges @ 0.1 on (a+b+c)				494.73	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				544.20	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				6490.05	
					say	<u>6490.00</u>	
	(v)	60 cm x 45 cm rectangular					
		d) Overhead charges @ 0.1 on (a+b+c)				318.33	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				350.16	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				4355.61	
					say	<u>4356.00</u>	
	(vi)	60 cm x 60 cm square					
		d) Overhead charges @ 0.1 on (a+b+c)				393.93	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				433.32	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				5270.37	
					say	<u>5270.00</u>	
	(vii)	90 cm high octagon					
		d) Overhead charges @ 0.1 on (a+b+c)				656.01	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				721.61	
		Rate per traffic sign = ( i+ii+iii+a+b+c+d+e)				8441.53	
					say	<u>8442.00</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 Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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					
		<i>Unit = sqm</i>					
		<i>Taking output = 0.9 sqm</i>					
		<b>i) Excavation for foundation</b>	cum	0.216	159.00	34.34	Item No. 3.13 A
		<b>ii) Cement concrete M15 grade</b>	cum	0.120	3733.00	447.96	Item 12.8 (A)
		<b>iii) Painting angle iron post two coats</b>	sqm	0.430	50.00	21.50	Item 8.9
		<b>a) Labour (For fixing at site)</b>					
		Mate	day	0.010	171.00	1.71	L-12
		Mazdoor	day	0.200	157.00	31.40	L-13
		<b>b) Material</b>					
		Mild steel angle iron 75 mm x 75 mm x 6 mm, 2.85 metres long	kg	19.000	44.879	852.71	M-179 /1000
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting of size 0.9 sqm	sqm	0.900	8400.00	7560.00	M-061
		Add 2 per cent of cost of materials for drilling holes, nuts, bolts, fabrication etc.				168.25	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.020	459.00	9.18	P&M-053
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				862.32	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				948.56	
		Cost for 0.9 sqm =I+ii+iii+ a+b+c+d+e				10937.93	
		Rate per sqm (for sign having area upto 0.9 sqm) = (I+ii+iii+a+b+c+d+e)/0.90				12153.26	
					<i>say</i>	<u><b>12153.00</b></u>	
	<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					
<b>8.6</b>	<b>801</b>	<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					
		<i>Unit = sqm</i>					
		<i>Taking output = 1.50 sqm</i>					
		<b>i) Excavation for foundation</b>	cum	0.430	159.00	68.37	Item No. 3.13 A
		<b>ii) Cement concrete M15 grade</b>	cum	0.240	3733.00	895.92	Item 12.8 (A)
		<b>iii) Painting angle iron post 2 coats</b>	sqm	0.860	50.00	43.00	Item 8.9
		<b>a) Labour (For fixing at site)</b>					
		Mate	day	0.010	171.00	1.71	L-12
		Mazdoor	day	0.300	157.00	47.10	L-13
		<b>b) Material</b>					
		Mild steel angle iron 75 mm x 75 mm x 6 mm, 2.85 metres long, 2 nos	kg	38.000	44.879	1705.42	M-179 /1000
		Aluminium sheeting fixed with encapsulated lens type reflective sheeting	sqm	1.500	8400.00	12600.00	M-061

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 2 per cent of cost of materials for drilling holes, nuts, bolts, fabrication etc.				286.11	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.020	459.00	9.18	P&M-053
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				1464.95	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1611.45	
		Cost for 1.5 sqm = I+ii+iii+ a+b+c+d+e				18733.20	
		<b>Rate per sqm ( for sign having area more than 0.9 sqm) = ( i+ii+iii+a+b+c+d+e)/1.50</b>				12488.80	
					<i>say</i>	<u>12489.00</u>	
		<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</b>					
		<b>Truss and Vertical Support</b>					
		<i>Unit = tonne</i>					
		<i>Taking output = 1 tonne</i>					
		<b>a) Labour</b>					
		Mate	day	0.240	171.00	41.04	L-12
		Blacksmith	day	2.000	213.00	426.00	L-02a
		Mazdoor including for handling & fixing at site.	day	4.000	157.00	628.00	L-13
		<b>b) Material</b>					
		Aluminium alloy/galvanised steel including 5 per cent wastage	tonne	1.050	36000.00	37800.00	M-060
		Add 1 per cent on cost of material for nuts, bolts and drilling and welding consumables				378.00	
		Add 15 per cent on cost of material for fabrication of trusses as per approved design				5726.70	
		<b>c) Machinery</b>					
		Crane 3 tonne capacity	hour	3.000	452.00	1356.00	P&M-013
		Truck	hour	0.500	782.00	391.00	P&M-057
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				4674.67	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				5142.14	
		<b>Rate per tonne = (a+b+c+d+e)</b>				56563.56	
					<i>say</i>	<u>56564.00</u>	
8.7		<b>B</b>					
		<b>Aluminium Alloy Plate for Over Head Sign</b>					
		<i>Unit = sqm</i>					
		<i>Taking output = 1 sqm</i>					
		<b>a) Labour</b>					
		Mate	day	0.020	171.00	3.42	L-12
		Blacksmith	day	0.100	213.00	21.30	L-02a
		Mazdoor	day	0.150	157.00	23.55	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	9000.00	9000.00	M-059
		<b>Miscellaneous</b>					
		Add 1 per cent of cost of labour for lifting arrangement, like ladders, pulleys, ropes etc				0.48	
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				904.88	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				995.36	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per sqm = (a+b+c+d)				10948.99	
					<i>say</i>	<u>10949.00</u>	
		Note					
		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.					
8.8	803	Painting Two Coats on New Concrete Surfaces					
		Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces					
		<i>Unit = sqm</i>					
		<i>Taking output = 40 sqm</i>					
		a) Labour					
		Mate	day	0.120	171.00	20.52	L-12
		Painter	day	2.000	201.00	402.00	L-18
		Mazdoor	day	1.000	157.00	157.00	L-13
		b) Material					
		Paint conforming to requirement of clause 803.3. Add for scaffolding @ 1 percent of labour cost where required	Litre	6.000	217.80	1306.80	M-132
						5.80	
		c) Overhead charges @ 0.1 on (a+b)				189.21	
		d) Contractor's profit @ 0.1 on (a+b+c)				208.13	
		Cost for 40 sqm = a+b+c+d				2289.46	
		Rate per sqm = (a+b+c+d)/40				57.24	
					<i>say</i>	<u>57.00</u>	
8.9	803	Painting on Steel Surfaces					
		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					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		a) Labour					
		Mate	day	0.030	171.00	5.13	L-12
		Painter	day	0.450	201.00	90.45	L-18
		Mazdoor	day	0.250	157.00	39.25	L-13
		b) Material					
		Paint ready mixed approved brand. Add @ 1 per cent on cost of material for scaffolding	Litre	1.250	217.80	272.25	M-131
						2.72	
		c) Overhead charges @ 0.1 on (a+b)				40.98	
		d) Contractor's profit @ 0.1 on (a+b+c)				45.08	
		Cost for 10 sqm = a+b+c+d				495.86	
		Rate per sqm = (a+b+c+d)/10				49.59	
					<i>say</i>	<u>50.00</u>	
8.10	803	Painting on Wood Surfaces					
		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					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		a) Labour					
		Mate	day	0.030	171.00	5.13	L-12
		Painter	day	0.500	201.00	100.50	L-18
		Mazdoor	day	0.200	157.00	31.40	L-13
		b) Material					
		Paint ready mixed of approved brand. Add @ 1 per cent on cost of material for scaffolding	Litre	1.500	217.80	326.70	M-131
						3.27	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Overhead charges @ 0.1 on (a+b)				46.70	
		d) Contractor's profit @ 0.1 on (a+b+c)				51.37	
		Cost for 10 sqm = a+b+c+d				565.07	
		Rate per sqm = (a+b+c+d)/10				56.51	
					<i>say</i>	<u>57.00</u>	
8.11	803	Painting Lines, Dashes, Arrows etc on Roads in Two Coats on New Work					
		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					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		a) Labour					
		Mate	day	0.090	171.00	15.39	L-12
		Painter	day	0.550	201.00	110.55	L-18
		Mazdoor	day	1.550	157.00	243.35	L-13
		b) Material					
		Road marking Paint as per IS :164	Litre	1.480	217.80	322.34	M-132
		c) Overhead charges @ 0.1 on (a+b)				69.16	
		d) Contractor's profit @ 0.1 on (a+b+c)				76.08	
		Cost for 10 sqm = a+b+c+d				836.88	
		Rate per sqm = (a+b+c+d)/10				83.69	
					<i>say</i>	<u>84.00</u>	
8.11		(ii) Up to 10 cm in width					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		a) Labour					
		Mate	day	0.070	171.00	11.97	L-12
		Painter	day	0.350	201.00	70.35	L-18
		Mazdoor	day	1.350	157.00	211.95	L-13
		b) Material					
		Road marking paint	Litre	1.480	217.80	322.34	M-132
		c) Overhead charges @ 0.1 on (a+b)				61.66	
		d) Contractor's profit @ 0.1 on (a+b+c)				67.83	
		Cost for 10 sqm = a+b+c+d				746.10	
		Rate per sqm = (a+b+c+d)/10				74.61	
					<i>say</i>	<u>75.00</u>	
8.12	803	Painting Lines, Dashes, Arrows etc on Roads in Two Coats on Old Work					
		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					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		a) Labour					
		Mate	day	0.060	171.00	10.26	L-12
		Painter 1st class	day	0.300	201.00	60.30	L-18
		Mazdoor	day	1.250	157.00	196.25	L-13
		b) Material					
		Road marking paint	Litre	0.900	217.80	196.02	M-132
		c) Overhead charges @ 0.1 on (a+b)				46.28	
		d) Contractor's profit @ 0.1 on (a+b+c)				50.91	
		Cost for 10 sqm = a+b+c+d				560.02	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per sqm = (a+b+c+d)/10				56.00	
					say	<u>56.00</u>	
8.12	(ii)	Up to 10 cm in width					
		<i>Unit = sqm</i>					
		Taking output = 10 sqm					
		a) Labour					
		Male	day	0.070	171.00	11.97	L-12
		Painter 1st class	day	0.350	201.00	70.35	L-18
		Mazdoor	day	1.350	157.00	211.95	L-13
		b) Material					
		Road marking Paint	Litre	0.900	217.80	196.02	M-132
		c) Overhead charges @ 0.1 on (a+b)				49.03	
		d) Contractor's profit @ 0.1 on (a+b+c)				53.93	
		Cost for 10 sqm= a+b+c+d				593.25	
		Rate per sqm = (a+b+c+d)/10				59.33	
					say	<u>59.00</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.					
		<i>Unit = sqm</i>					
		Taking output = 640 sqm					
		a) Labour					
		Male	day	0.500	171.00	85.50	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		b) Machinery					
		Road marking machine @ 80 sqm per hour	hour	8.000	118.00	944.00	P&M-043
		Tractor-trolley	hour	8.000	459.00	3672.00	P&M-053
		c) Material					
		Hot applied thermoplastic compound	Litre	2000.000	195.17	390336.00	M-118
		Reflectorising glass beads	kg	200.000	63.43	12686.00	M-152
		d) Overhead charges @ 0.1 on (a+b+c)				40803.75	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				44884.13	
		Cost for 640 sqm = a+b+c+d+e				493725.38	
		Rate per sqm = (a+b+c+d+e)/640				771.45	
					say	<u>771.00</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 M15grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and printing etc					
	(i)	5th kilometre stone (precast)					
		<i>Unit = Nos.</i>					
		Taking output = 6 Nos.					
		a) M-15 grade of concrete	cum	2.350	3733.00	8772.55	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	22.080	64.324	1420.27	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	1.680	159.00	267.12	Item No. 3.13 A
		d) Painting two coats on concrete surface	sqm	9.850	57.00	561.45	Item 8.8

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Lettering on km post (average 30 letters of 10 cm height each)	per cm per letter	1800.000	0.34	612.00	Item 8.3
		Transportation and fixing					
		f) Labour					
		Mate	day	0.260	171.00	44.46	L-12
		Mason	day	0.600	213.00	127.80	L-11
		Mazdoor including loading/unloading	day	6.000	157.00	942.00	L-13
		g) Machinery					
		Tractor-trolley	hour	6.000	459.00	2754.00	P&M-053
		h) Overhead charges @ 0.1 on (f+g)				386.83	
		i) Contractor's profit @ 0.1 on (f+g+h)				425.51	
		Cost for 6 Nos. 5th km stone = a+b+c+ d+e +f+g+h +i				16313.99	
		Rate for each 5th km stone = (a+b+c+d+e+f+g+h+i)/ 6				2719.00	
					<i>say</i>	<u>2719.00</u>	
8.14	(ii)	Ordinary kilometer stone (precast)					
		<i>Unit = Nos.</i>					
		<i>Taking output = 14 Nos.</i>					
		a) M-15 grade of concrete	cum	3.770	3733.00	14073.41	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	26.320	64.324	1693.01	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	2.770	159.00	440.43	Item No. 3.13 A
		d) Painting two coats on concrete surface	sqm	11.410	57.00	650.37	Item 8.8
		e) Lettering on km post ( average 12 letters of 10 cm height each)	per cm per letter	1680.000	0.34	571.20	Item 8.3
		Transportation and fixing					
		f) Labour					
		Mate	day	0.320	171.00	54.72	L-12
		Mason	day	1.000	213.00	213.00	L-11
		Mazdoor	day	7.000	157.00	1099.00	L-13
		g) Machinery					
		Tractor-trolley	hour	6.000	459.00	2754.00	P&M-053
		h) Overhead charges @ 0.1 on (f+g)				412.07	
		i) Contractor's profit @ 0.1 on (f+g+h)				453.28	
		Cost for 14 Nos. ordinary km stone = (a+b+ c+d+e+f+g+h+i)				22414.49	
		Rate for each ordinary km stone = (a+b+ c+d+e+f+g+h+i) /14				1601.03	
					<i>say</i>	<u>1601.00</u>	
8.14	(iii)	Hectometer stone (precast)					
		<i>Unit = Nos.</i>					
		<i>Taking output = 33 Nos.</i>					
		a) M-15 grade of concrete	cum	1.580	3733.00	5898.14	Item 12.8 (A)
		b) Steel reinforcement @ 5 kg per sqm	kg	66.000	64.324	4245.38	Item 13.6 /1000
		c) Excavation in soil for foundation	cum	1.390	159.00	221.01	Item No. 3.13 A
		d) Painting two coats on concrete surface	sqm	6.270	57.00	357.39	Item 8.8
		e) Lettering on km post (average 1 letter of 10 cm height each)	per cm per letter	330.000	0.34	112.20	Item 8.3
		Transportation and fixing					
		f) Labour					
		Mate	day	0.340	171.00	58.14	L-12
		Mason	day	1.500	213.00	319.50	L-11
		Mazdoor	day	7.000	157.00	1099.00	L-13
		g) Machinery					
		Tractor-trolley	hour	6.000	459.00	2754.00	P&M-053
		h) Overhead charges @ 0.1 on (f+g)				423.06	
		i) Contractor's profit @ 0.1 on (f+g+h)				465.37	
		Cost for 33 Nos. Hectometer stone = (a+b+c+d+e+f+ g+h+i)				15953.20	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate for each Hectometer stone = (a+b +c +d+e+f+ g+h+i) / 33				483.43	
					say	<u>483.00</u>	
		<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	171.00	6.84	L-12
		Mazdoor for fixing	day	1.000	157.00	157.00	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	774.40	23232.00	M-091
		Add 10 per cent cost of material for installation				2323.20	
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				2571.90	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2829.09	
		Cost for 30 Nos. delineators = (a+b+ c+d)				31120.04	
		Rate per delineators = (a+b+c+d) /30				1037.33	
					say	<u>1037.00</u>	
		<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	3733.00	4666.25	Item 12.8 (A)
		<b>b) Steel reinforcement</b>	kg	79.800	64.324	5133.06	Item 13.6 /1000
		<b>c) Excavation in soil</b>	cum	10.720	159.00	1704.48	Item No. 3.13 A
		<b>d) Lettering, each 10 cm high</b>	per letter per cm high	2280.000	0.34	775.20	Item 8.3
		<b>Transportation and fixing</b>					
		<b>e) Labour</b>					
		Mate	day	0.570	171.00	97.47	L-12
		Mazdoor	day	14.250	157.00	2237.25	L-13
		<b>f) Machinery</b>					
		Tractor-trolley	hour	6.000	459.00	2754.00	P&M-053
		<b>g) Material</b>					
		Stone spall	cum	11.970	294.26	3522.29	M-008
		<b>h) Overhead charges @ 0.1 on (e+f+g)</b>				861.10	
		<b>i) Contractor's profit @ 0.1 on (e+f+g+h)</b>				947.21	
		Cost for 57 Nos. boundary pillar = (a+b +c+d +e+ f+g+h+i)				22698.31	
		Rate for each boundary pillar = (a+b+c+d+e+ f+g+h+i)/57				398.22	
					say	<u>398.00</u>	
		<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>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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					
		<i>Unit = per running metre</i>					
		<i>Taking output = 30 metres</i>					
		<b>a) Labour</b>					
		Mate	day	0.090	171.00	15.39	L-12
		Blacksmith	day	0.250	213.00	53.25	L-02a
		Mazdoor	day	2.000	157.00	314.00	L-13
		<b>b) Material</b>					
		Barbed wire 335 metres length @ 9.38 kg per 100 metres	kg	31.420	52.94	1663.37	M-063
		MS angle iron 40 mm x 40mm x 6 mm, 23 metres in length @ 3.5 kg per metre	kg	80.500	44.879	3612.79	M-179 /1000
		Add for GI staple binding wire, drilling holes etc. @ 2 per cent of the cost of material				105.52	
		<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	50.00	105.50	Item 8.9
		<b>d) Overhead charges @ 0.1 on (a+b)</b>				576.43	
		<b>e) Contractor's profit @ 0.1 on (a+b+d)</b>				634.08	
		Cost for 30 metres fencing = a+b+c+d+e				7080.34	
		Rate per metre = (a+b+c+d+e)/30				236.01	
					<i>say</i>	<u>236.00</u>	
		<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.					
<b>8.18</b>	<b>807</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					
		<i>Unit = per running metre</i>					
		<i>Taking output = 30 metres</i>					
		<b>a) Labour</b>					
		Mate	day	0.120	171.00	20.52	L-12
		Blacksmith	day	0.400	213.00	85.20	L-02a
		Mazdoor	day	2.500	157.00	392.50	L-13
		<b>b) Material</b>					
		Barbed wire 428 metres length @ 9.38 kg per 100 metres	kg	40.150	52.94	2125.54	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	44.879	6821.66	M-179 /1000
		Add for GI staple, binding wire, drilling holes etc. @ 2 per cent of the cost of material				178.94	
		<b>c) Painting</b>					
		Applying two coats of painting on exposed surface of angle iron posts	sqm	3.960	50.00	198.00	Item 8.9
		<b>d) Overhead charges @ 0.1 on (a+b)</b>				962.44	
		<b>e) Contractor's profit @ 0.1 on (a+b+d)</b>				1058.68	
		Cost for 30 metres fencing = a+b+c+d+e				11843.49	



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per metre fencing = (a+b+c +d+e)/30				394.78	
					<i>say</i>	<u>395.00</u>	
		<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 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.					
		<i>Unit = Running metre</i>					
		<i>Taking output = 30 m</i>					
		<b>a) Labour</b>					
		Mate	day	0.120	171.00	20.52	L-12
		Welder	day	1.000	239.00	239.00	L-02b
		Mazdoor	day	2.000	157.00	314.00	L-13
		<b>b) Material</b>					
		i) Angle iron for posts 50 x 50 x 6 mm	kg	106.000	44.879	4757.21	M-179 /1000
		ii) Runner flat 50 x 5 mm	kg	26.000	44.879	1166.86	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	37.07	5597.57	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				288.04	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.100	459.00	45.90	P&M-053
		<b>d) Painting</b>					
		Painting two coats including priming	sqm	8.000	50.00	400.00	Item 8.9
		<b>e) Overhead charges @ 0.1 on (a+b+c)</b>				1242.91	
		<b>f) Contractor's profit @ 0.1 on (a+b+c+e)</b>				1367.20	
		Cost for 30 metre = a+b+c+d+e+f				15439.22	
		Rate per metre = (a+b+c+d+e+f)/30				514.64	
					<i>say</i>	<u>515.00</u>	
		<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					
		<i>Unit = Running metre</i>					
		<i>Taking output = 10metres</i>					
		<b>i) Excavation for foundation (6 Nos)6 x 0.6 x 0.6 x 0.6</b>	cum	1.296	159.00	206.06	Item No. 3.13 A
		<b>ii) Foundation concrete M-15 grade PCC 6 x 0.6 x 0.6 x 0.3</b>	cum	0.648	3733.00	2418.98	Item 12.8 (A)
		<b>iii) Painting of pipe</b>	sqm	4.710	50.00	235.50	Item 8.9
		<b>iv) Painting of channel section 6 nos,1.8 metres each 0.2 x 1.8 x 6 = 2.16</b>	sqm	2.160	50.00	108.00	Item 8.9
		<b>a) Labour (For fixing at site)</b>					
		Mate	day	0.010	171.00	1.71	L-12

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor	day	0.250	157.00	39.25	L-13
		Plumber	day	0.010	201.00	2.01	L-02c
		<b>b) Material</b>					
		Steel pipe 50 mm external dia as per IS:1239	metre	30.000	221.11	6633.30	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	44.879	4459.21	M-179 /1000
		Add for drilling holes @ 2 per cent of cost of channels				89.18	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.040	459.00	18.36	P&M-053
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				1421.16	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1563.27	
		Cost for 10 metre =i+ii+iii+iv+ a+b+c+d+e				17196.01	
		Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10				1719.60	
					<i>say</i>	<u>1720.00</u>	
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					
		<i>Unit = Running metre</i>					
		<i>Taking output = 10metres</i>					
		<b>i) Excavation for foundation (6 Nos) 6 x 0.6 x 0.6 x 0.6</b>	cum	1.296	159.00	206.06	Item No. 3.13 A
		<b>ii) Foundation concrete M - 15 grade PCC 6 x 0.6 x 0.6 x 0.3</b>	cum	0.648	3733.00	2418.98	Item 12.8 (A)
		<b>iii) RCC M - 20 for pre cast posts 6 nos of 1.8 metres each</b>	cum	0.320	4745.00	1518.40	Item 14.1(A)
		<b>iv) Painting of pipe</b>	sqm	4.710	50.00	235.50	Item 8.9
		<b>a) Labour</b>					
		Mate	day	0.014	171.00	2.39	L-12
		Mazdoor	day	0.350	157.00	54.95	L-13
		Plumber	day	0.010	201.00	2.01	L-02c
		<b>b) Material</b>					
		Steel pipe 50 mm dia as per IS:1239	metre	30.000	221.11	6633.30	M-175
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.250	459.00	114.75	P&M-053
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				680.74	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				748.81	
		Cost for 10 metre =i+ii+iii+iv+ a+b+c+d+e				12615.91	
		Rate per metre = (i+ii+iii+iv+a+b+c+d+e)/10				1261.59	
					<i>say</i>	<u>1262.00</u>	
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					
		<i>Unit = Linear metre</i>					
		<i>Taking output = 10 m</i>					
	(i)	<b>a) M 20 grade concrete</b>					
		M 20 grade concrete	cum	3.000	4745.00	14235.00	Item 14.1(A)
		<b>b) Labour</b>					
		Mate	day	0.040	171.00	6.84	L-12
		Mazdoor	day	1.000	157.00	157.00	L-13
		<b>c) Material</b>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		HYS steel reinforcement including dowel bars	tonne	0.280	42812.50	11987.50	M-082
		Pre-moulded asphalt filler board	sqm	0.320	937.50	300.00	M-144
		d) Overhead charges @ 0.1 on (b+c)				1245.13	
		e) Contractor's profit @ 0.1 on (b+c+d)				1369.65	
		Cost for 10 metre = a+b+c+d+e				29301.12	
		Rate per metre = (a+b+c+d+e)/10				2930.11	
					<i>say</i>	<u>2930.00</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					
		<i>Unit = Running metre</i>					
		<i>Taking output = 4.5 metre length</i>					
		a) Labour					
		Mate	day	0.060	171.00	10.26	L-12
		Blacksmith	day	0.500	213.00	106.50	L-02a
		Mazdoor	day	1.000	157.00	157.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.100	459.00	45.90	P&M-053
		c) Material					
		Corrugated sheet, 3 mm thick, "W" beam section railing, 4.5 m in length	kg	41.210	44.879	1849.48	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	44.879	3974.52	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	44.879	728.84	M-179 /1000
		Nuts and bolts	kg	20.000	58.03	1160.60	M-130
		Add 25 per cent of the cost of material for fabrication, nuts, bolts and washers etc.)				1928.36	
		d) Overhead charges @ 0.1 on (a+b+c)				996.15	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1095.76	
		Cost for 4.5 metre = a+b+c+d+e				12053.36	
		Rate per metre = (a+b+c+d+e)/4.5				2678.52	
					<i>say</i>	<u>2679.00</u>	
8.23	B	Type - B, "THRIE" : Metal Beam Crash Barrier					
		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					
		<i>Unit = Running metre</i>					
		<i>Taking output = 4.5 metre length</i>					
		a) Labour					
		Mate	day	0.060	171.00	10.26	L-12
		Blacksmith	day	0.500	213.00	106.50	L-02a

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor	day	1.000	157.00	157.00	L-13
		b) Machinery					
		Tractor-trolley	hour	0.100	459.00	45.90	P&M-053
		c) Material					
		Corrugated sheet, 3 mm thick, "Thrie" beam section railing, 4.5 m in length	kg	72.940	48.63	3547.07	M-088
		Channel post 150 x 75 x 5 mm, 2 m long, 3 Nos @ 16.4 kg per metre	kg	98.400	44.879	4416.13	M-179 /1000
		Spacer 150 x 75 x 5 mm channel 0.546 m long, 3 Nos	kg	26.860	44.879	1205.46	M-179 /1000
		Nuts and bolts	kg	30.000	58.03	1740.90	M-130
		Add 15 per cent of the cost of material for fabrication, nuts, bolts and washers etc.)				1636.43	
		d) Overhead charges @ 0.1 on (a+b+c)				1286.57	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1415.22	
		Cost for 4.5 metre = a+b+c+d+e				15567.44	
		Rate per metre = (a+b+c+d+e)/4.5				3459.43	
					<i>say</i>	<u>3459.00</u>	
		<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	Suggestive	<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.					
		<i>Unit = Running metre</i>					
		<i>Taking output = 15 metre</i>					
		a) Labour					
		Male	day	0.120	171.00	20.52	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		Blacksmith	day	1.000	213.00	213.00	L-02a
		b) Material					
		i) RS Joist 100 x 75 mm - 16.5 m @ 11.5 kg per metre	kg	190.000	44.879	8527.08	M-179 /1000
		ii) Struts - 2 Nos. for terminal posts, 2 m long each 2 x 2 x 11.50	kg	46.000	44.879	2064.45	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	44.879	8455.27	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	38.29	2488.85	M-177
		Add 5 per cent of cost of material for drilling, gripping, fixing, fabrication and welding consumables				1076.78	
		c) Painting					
		Applying 2 coats of painting on exposed surface	sqm	16.500	50.00	825.00	Item 8.9
		d) Machinery					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Tractor-trolley	hour	0.250	459.00	114.75	P&M-053
		e) Overhead charges @ 0.1 on (a+b+d)				2327.47	
		f) Contractor's profit @ 0.1 on (a+b+d+e)				2560.22	
		Cost for 15 m = a+b+c+d+e+f				28987.39	
		Rate per m = (a+b+c+d+e+f)/15				1932.49	
					say	<u>1932.00</u>	
		Note					The items of excavations and cement concrete works will be measured and included separately as per the approved designs and drawings.
8.26	Suggestive	Anti-Glare Devices in Median					
	A	Plantation					
							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	Anti-glare screen with 25 mm steel pipe framework fixed with circular and rectangular vanes					
							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
							<i>Unit = Running metre</i>
							Taking output = one metre
		a) Labour					
		Mate	day	0.004	171.00	0.68	L-12
		Mazdoor	day	0.100	157.00	15.70	L-13
		b) Material					
		i) 25 mm steel pipe	metre	16.000	123.54	1976.64	M-174
		ii) MS sheet for 600 x 300 x 3 mm rectangular vane, one number @ 24kg/sqm	kg	4.320	44.879	193.88	M-179 /1000
		iii) MS sheet for 250 mm dia circular vane 3 mm thick, 4 numbers @ 24 kg/sqm	kg	4.800	44.879	215.42	M-179 /1000
		Add 5 per cent cost of material for fabrication, welding, bending, nuts, bolts etc				119.30	
		c) Painting					
		Applying 2 coats of painting on exposed surface	sqm	1.830	50.00	91.50	Item 8.9
		d) Overhead charges @ 0.1 on (a+b)				252.16	
		e) Contractor's profit @ 0.1 on (a+b+d)				277.38	
		Rate per metre = a+b+c+d+e				3142.66	
					say	<u>3143.00</u>	
		Note					The items of excavation and cement concrete as per approved design to be measured and paid separately
8.26	C	Anti-glare screen with rectangular vane of MS sheet					
							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
							<i>Unit = Running metre</i>
							Taking output = 1.50 metre
		a) Labour					
		Mate	day	0.004	171.00	0.68	L-12
		Mazdoor	day	0.100	157.00	15.70	L-13

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<b>b) Material</b>					
		i) Angle iron post, 50 x 50 x 6 mm, length 2.35 m	kg	10.580	44.879	474.82	M-179 /1000
		ii) MS sheet 3 mm thick @ 24 kg/sqm	kg	9.000	44.879	403.91	M-179 /1000
		Add 5 percent of cost of material for fabrication, nuts, bolts etc				43.94	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.100	459.00	45.90	P&M-053
		<b>d) Painting</b>					
		Applying 2 coats of painting	sqm	0.850	50.00	42.50	Item 8.9
		e) Overhead charges @ 0.1 on (a+b+c)				98.50	
		f) Contractor's profit @ 0.1 on (a+b+c+e)				108.35	
		Cost for 1.5 m = a+b+c+d+e+f				1234.30	
		Rate per metre = (a+b+c+d+e+f)/1.50				822.87	
					say	<u>823.00</u>	
		<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.					
		<i>Unit = Each</i>					
		<i>Taking output = one light</i>					
		<b>a) Labour</b>					
		Mate	day	0.030	171.00	5.13	L-12
		Mazdoor	day	0.500	157.00	78.50	L-13
		Electrician	day	0.250	201.00	50.25	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 aluminium paint over steel circular hollow pipe with overhang on both sides	sqm	5.750	50.00	287.50	Item 8.9
		<b>For fixing in Footpath</b>					
		Providing two coats of aluminium paint over steel circular hollow pipe with overhang on one side	sqm	4.630	50.00	231.50	Item 8.9
		(i) <b>For Fixing in Median</b>					
		d) Overhead charges @ 0.1 on (a+b)				#VALUE!	
		e) Contractor's profit @ 0.1 on (a+b+d)				#VALUE!	
		Rate per light for fixing in Median= a+b+c+d+e				#VALUE!	
					say	<u>#VALUE!</u>	
		(ii) <b>For fixing in Footpath</b>					
		Rate per light for Fixing in Footpath = a+b+c+d+e				#VALUE!	
					say	<u>#VALUE!</u>	
		<b>Note</b>					
		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	<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					
		<i>Unit = Each</i>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Taking output = one light					
		a) Labour					
		Mate	day	0.020	171.00	3.42	L-12
		Mazdoor	day	0.400	157.00	62.80	L-13
		Electrician	day	0.200	201.00	40.20	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	50.00	138.00	Item 8.9
		d) Overhead charges @ 0.1 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	2132.00	5031.52	Item 12.7 (Addl.B)
		b) Labour					
		Mate	day	0.050	171.00	8.55	L-12
		Mazdoor	day	1.000	157.00	157.00	L-13
		Mazdoor skilled	day	0.250	200.00	50.00	L-15
		c) Material					
		Reinforced Cement Concrete pipe 300 mm dia	metre	20.000	514.90	10298.00	M-151
		Granular soil with PI less than 6 for bedding and sides of pipe (0.6 x 0.6 x 20 m)	cum	7.200	127.69	919.37	M-009
		Collar for joints 300 mm dia	each	9.000	0.00	0.00	M-083
		Cement mortar 1:2 for joints	cum	0.020	3943.00	78.86	Item 12.6 (B)
		d) Machinery					
		Tractor-trolley	hour	0.500	459.00	229.50	P&M-053
		e) Overhead charges @ 0.1 on (b+c+d)				1174.13	
		f) Contractor's profit @ 0.1 on (b+c+d+e)				1291.54	
		Cost for 20 metre = a+b+c+d+e+f				19238.47	
		Rate per metre = (a+b+c+d+e+f)/20				961.92	
					say	<u>962.00</u>	
8.29		Case(ii) Double row for two utility services					
		Unit = Running metre					
		Taking output = 20metres					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Random Rubble brick/Brick masonry in cement mortar 1:6 for head wall both sides.	cum	3.370	2132.00	7184.84	Item 12.7 (Addl.B)
		b) Labour					
		Male	day	0.050	171.00	8.55	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		Mazdoor skilled	day	0.250	200.00	50.00	L-15
		c) Material					
		Reinforced Cement Concrete pipe 300 mm dia	metre	40.000	514.90	20596.00	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	127.69	1838.74	M-009
		Collar for joints 300 mm dia	each	18.000	0.00	0.00	M-083
		Cement mortar 1:2 for joints	cum	0.040	3943.00	157.72	Item 12.6 (B)
		d) Machinery					
		Tractor-trolley	hour	1.000	459.00	459.00	P&M-053
		e) Overhead charges @ 0.1 on (b+c+d)				2342.40	
		f) Contractor's profit @ 0.1 on (b+c+d+e)				2576.64	
		Cost for 20 metre = a+b+c+d+e+f				35527.89	
		Rate per metre = (a+b+c+d+e+f)/20				1776.39	
					<i>say</i>	<u>1776.00</u>	
8.29	Case(iii)	Triple rRow for three utility services					
		<i>Unit = Running metre</i>					
		<i>Taking output = 20metres</i>					
		a) Random Rubble brick/Brick masonry in cement mortar 1:6 for head wall both sides.	cum	4.380	2132.00	9338.16	Item 12.7 (Addl.B)
		b) Labour					
		Male	day	0.160	171.00	27.36	L-12
		Mazdoor	day	3.000	157.00	471.00	L-13
		Mazdoor skilled	day	1.000	200.00	200.00	L-15
		c) Material					
		Reinforced Cement Concrete pipe 300 mm dia	metre	60.000	514.90	30894.00	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	127.69	2758.10	M-009
		Collar for joints 300 mm dia	each	27.000	0.00	0.00	M-083
		Cement mortar 1:2 for joints	cum	0.060	3943.00	236.58	Item 12.6 (B)
		d) Machinery					
		Tractor-trolley	hour	1.500	459.00	688.50	P&M-053
		e) Overhead charges @ 0.1 on (b+c+d)				3527.55	
		f) Contractor's profit @ 0.1 on (b+c+d+e)				3880.31	
		Cost for 20 metre = a+b+c+d+e+f				52021.57	
		Rate per metre = (a+b+c+d+e+f)/20				2601.08	
					<i>say</i>	<u>2601.00</u>	
	Note	1.Inspection chamber at both ends is the responsibility of the agency who is laying the duct. Hence not included. 2.The rates for stone masonry / brick masonry and cement mortar to be adopted from respective clauses.					
8.30	Suggestive	Highway Patrolling and Traffic Aid Post					
		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	Items Related to Underpass/ Subway/ Overhead Bridge/ Overhead Foot Bridge					
		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					



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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>					
		<i>Unit = tonne</i>					
		Taking output=1 tonne					
		a) <b>Labour</b>					
		Mate	day	0.120	171.00	20.52	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		Blacksmith	day	1.000	213.00	213.00	L-02a
		b) <b>Material</b>					
		Alluminium alloy/galvanised steel including 5 per cent wastage	tonne	1.050	36000.00	37800.00	M-060
		Add 15 per cent of cost of material for fabrication and erection.				5670.00	
		Add 1 per cent of cost of material for nuts, bolts and welding				378.00	
		c) <b>Machinery</b>					
		Truck 10 tonne	hour	1.000	782.00	782.00	P&M-057
		d) <b>Overhead charges @ 0.1 on (a+b+c)</b>				4517.75	
		e) <b>Contractor's profit @ 0.1 on (a+b+c+d)</b>				4969.53	
		<b>Rate per tonne = a+b+c+d+e</b>				54664.80	
					say	<u>54665.00</u>	
8.33		(ii) <b>Message Display</b>					
		Message display board 6 sqm electronically operated with complete electronic fitments for flashing the pre-determined messages.					
		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.					
		<i>Unit = sqm</i>					
		Taking output = 20sqm					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	1.500	157.00	235.50	L-13
		Blacksmith	day	0.250	213.00	53.25	L-02a
		b) Material					
		Scrap tyres of size 900 x 20	each	80.000	75.00	6000.00	M-161
		20 mm steel wire rope	kg	150.000	38.29	5743.50	M-176
		Add 1 per cent of cost of wire rope for clamps etc.				57.44	
		c) Machinery					
		Tractor-trolley	hour	3.000	459.00	1377.00	P&M-053
		d) Overhead charges @ 0.1 on (a+b+c)				1348.04	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1482.84	
		Cost for 20 sqm = a+b+c+d+e				16311.24	
		Rate per sqm = (a+b+c+d+e)/20				815.56	
					say	<u>816.00</u>	
8.34	B	Using Plastic/Steel Barrel, Filled with Sand					
		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					
		<i>Unit = sqm</i>					
		Taking output = 20sqm					
		a) Labour					
		Mate	day	0.130	171.00	22.23	L-12
		Mazdoor	day	3.000	157.00	471.00	L-13
		Blacksmith	day	0.250	213.00	53.25	L-02a
		b) Material					
		Plastic barrels	each	50.000			
		or					
		Steel barrels	each	50.000	120.00	6000.00	M-172
		Sand	cum	8.000	133.28	1066.24	M-004
		20 mm steel wire rope	kg	15.000	38.29	574.35	M-176
		Add 1 per cent of cost of wire rope for clamps etc.				5.74	
		c) Machinery					
		Tractor-trolley	hour	2.000	459.00	918.00	P&M-053
		d) Overhead charges @ 0.1 on (a+b+c)				911.08	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1002.19	
		Cost for 20 sqm = a+b+c+d+e				11024.08	
		Rate per sqm = (a+b+c+d+e)/20				551.20	
					say	<u>551.00</u>	
8.34	C	With HI - DRO cell Sandwich (Patented)					
		(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 patented 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					
		<i>Unit = sqm</i>					
		Taking output = 10sqm					
		a) Labour					
		Mate	day	0.100	171.00	17.10	L-12
		Mazdoor	day	2.500	157.00	392.50	L-13
		b) Material					
		Plastic tubes 50 cm dia, 1.2 m high	each	40.000	input	#VALUE!	M-139
		Cost of water	KL	12.000	225.00	2700.00	M-189
		20 mm steel wire rope	kg	100.000	38.29	3829.00	M-176

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 1 per cent of cost of wire rope for clamps etc.				38.29	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	2.000	459.00	918.00	P&M-053
		Water tanker 6 KL capacity	hour	2.000	154.00	308.00	P&M-060
		<b>d) Overhead charges @ 0.1 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!	
		Rate per sqm = (a+b+c+d+e)/10				#VALUE!	
					say	<b>#VALUE!</b>	
8.35	Suggestive	Road Markers/Road Stud with micro prismatic Lense Reflector					
		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	171.00	6.84	L-12
		Mazdoor	day	1.000	157.00	157.00	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	165.00	8250.00	M-062
		Add 10 per cent of cost of material for fixing and installation				825.00	
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				923.88	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1016.27	
		Cost for 50 studs = a+b+c+d				11179.00	
		Rate per studs = (a+b+c+d)/50				223.58	
					say	<b>224.00</b>	
8.36	Suggestive	Traffic Cone					
		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.					
		<b>a) Labour</b>					
		Mate	day	0.020	171.00	3.42	L-12
		Mazdoor	day	0.500	157.00	78.50	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	459.00	45.90	P&M-053
		<b>d) Overhead charges @ 0.1 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!	
		Rate per metre = (a+b+c+d+e)/68				#VALUE!	
					say	<b>#VALUE!</b>	
8.37	Suggestive	Roadside Amenities					
	A	Rest areas					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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.					
		<b>C 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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 100 sqm (including gaps)</i>					
		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					
		<i>Unit = each</i>					
		<i>Taking output = one number</i>					
		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			
		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>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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 do not 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, intercoms, 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					
		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>					
		<b>Taking output = one sign post</b>					
		Following types of signs are required to be fixed in construction zones for safety of traffic					
		a) Diversion one km ahead					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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>					
		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					
		<i>Unit = each</i>					
		Taking output = one steel portable barricade					
		<b>a) Labour</b>					
		Mate	day	0.020	171.00	3.42	L-12
		Mazdoor	day	0.250	157.00	39.25	L-13
		Painter	day	0.500	201.00	100.50	L-18
		Welder	day	0.250	239.00	59.75	L-02b
		<b>b) Material</b>					
		Angle iron 45 x 45 x 5 mm	kg	25.000	44.879	1121.98	M-179 /1000
		MS sheet 300 mm wide,2.5 m long and 2.6 mm thick	kg	15.000	44.879	673.19	M-179 /1000
		Paint	litre	0.500	217.80	108.90	M-131
		Add 2 per cent of cost of steel for welding consumables, nuts & bolts and drilling holes				35.90	
		c) Overhead charges @ 0.1 on (a+b)				214.29	
		d) Contractor's profit @ 0.1 on (a+b+c)				235.72	
		Rate per barricade = a+b+c+d				2592.91	
					say	<b>2593.00</b>	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
8.44	suggestive	Permanent Type Barricade in Construction Zone					
	A	With steel components					
		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					
		<i>Unit = each</i>					
		Taking output = one barricade					
		a) Labour					
		Mate	day	0.050	171.00	8.55	L-12
		Mazdoor	day	0.300	157.00	47.10	L-13
		Painter	day	0.600	201.00	120.60	L-18
		Welder	day	0.300	239.00	71.70	L-02b
		b) Material					
		Angle iron 50 x 50 x 5 mm, 2 m long, 2 Nos.	kg	15.000	44.879	673.19	M-179 /1000
		MS sheet of 12 SWG, 3 Nos of 200 mm width and 4 m length	kg	50.000	44.879	2243.97	M-179 /1000
		Paint	litre	1.000	217.80	217.80	M-131
		Add 1 per cent of cost of steel for welding consumables, nuts & bolts and drilling holes				29.17	
		c) Overhead charges @ 0.1 on (a+b)				341.21	
		d) Contractor's profit @ 0.1 on (a+b+c)				375.33	
		Rate per barricade = a+b+c+d				4128.62	
					<i>say</i>	<u>4129.00</u>	
8.44	B	With wooden components					
		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					
		<i>Unit = each</i>					
		Taking output = one barricade					
		a) Labour					
		Mate	day	0.050	171.00	8.55	L-12
		Mazdoor	day	0.300	157.00	47.10	L-13
		Painter	day	0.600	201.00	120.60	L-18
		Carpenter	day	0.600	213.00	127.80	L-04
		b) Material					
		Timber	cum	0.180	41550.00	7479.00	M-185
		Add 1 per cent of cost of timber for nuts & bolts, nails, etc.				74.79	
		c) Overhead charges @ 0.1 on (a+b)				785.78	
		d) Contractor's profit @ 0.1 on (a+b+c)				864.36	
		Rate per barricade = a+b+c+d				9507.99	
					<i>say</i>	<u>9508.00</u>	
8.44	C	With 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					
		<i>Unit = each</i>					
		Taking output = one barricade					
		a) Labour					
		Mate	day	0.240	171.00	41.04	L-12
		Mazdoor	day	3.000	157.00	471.00	L-13
		Painter	day	1.000	201.00	201.00	L-18
		Mason	day	2.000	213.00	426.00	L-11

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Material					
		Brick	each	1800.000	5.636	10144.80	M-079
		Cement	kg	22.000	5.462	120.16	M-081 /1000
		Sand	cum	0.090	133.28	12.00	M-005
		Paint	litre	1.250	217.80	272.25	M-131
		c) Overhead charges @ 0.1 on (a+b)				1168.82	
		d) Contractor's profit @ 0.1 on (a+b+c)				1285.71	
		Rate per barricade = a+b+c+d				14142.78	
					<i>say</i>	<u>14143.00</u>	
8.45	suggestive	Drum Delineator in Construction Zone					
		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					
		<i>Unit = each</i>					
		<i>Taking output = one drum delineator</i>					
		a) Labour					
		Mate	day	0.020	171.00	3.42	L-12
		Mazdoor	day	0.250	157.00	39.25	L-13
		Painter	day	0.250	201.00	50.25	L-18
		b) Material					
		Steel drum 300 mm dia 1.2 m high/empty bitumen drum	each	1.000	120.00	120.00	M-172
		Paint	litre	0.500	217.80	108.90	M-131
		c) Overhead charges @ 0.1 on (a+b)				32.18	
		d) Contractor's profit @ 0.1 on (a+b+c)				35.40	
		Rate per drum delineator = a+b+c+d				389.40	
					<i>say</i>	<u>389.00</u>	
8.46	suggestive	Flagman					
		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					
		<i>Unit = each</i>					
		<i>Taking output = one flagman</i>					
		a) Labour					
		Mate	day	0.040	171.00	6.84	L-12
		Mazdoor	day	1.000	157.00	157.00	L-13
		b) Material					
		Flag of red color cloth 600 x 600 mm	each	1.000	45.00	45.00	M-099
		Wooden staff for fastening of flag 25 mm dia, one m long	each	1.000	30.00	30.00	M-196
		c) Overhead charges @ 0.1 on (a+b)				23.88	
		d) Contractor's profit @ 0.1 on (a+b+c)				26.27	
		Rate per flagman = a+b+c+d				289.00	
					<i>say</i>	<u>289.00</u>	



## 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.

## Summary of Rate Analysis

### CHAPTER-9 PIPE CULVERTS

Item No.	Descriptions	Unit	Rate (in Rs.)
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	2837.00
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 . )		
<b>A</b>	<b>1000 mm dia</b>	metre	3559.00
<b>B</b>	<b>1200 mm dia</b>	metre	5053.00
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 . )		
<b>A</b>	<b>1000 mm dia</b>	metre	7161.00
<b>B</b>	<b>1200 mm dia</b>	metre	10153.00

## Analysis of Rate

### CHAPTER-9 PIPE CULVERTS

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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.					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.640	171.00	109.44	L-12
		Mason	day	1.000	213.00	213.00	L-11
		Mazdoor	day	15.000	157.00	2355.00	L-13
		<b>b) Material</b>					
		40mm Aggregate at site	cum	13.800	425.02	5865.28	M-055
		Sand at site	cum	6.900	133.28	919.63	M-005
		Cement at site	tonne	3.300	5462.00	18024.60	M-081
		Cost of water	KL	18.000	225.00	4050.00	M-189
		<b>c) Machinery</b>					
		Concrete mixer 0.4/ 0.28 cum	hour	6.000	58.00	348.00	P&M-009
		Generator set 33 KVA	hour	6.000	470.00	2820.00	P&M-079
		Water tanker 6 KL capacity	hour	3.000	154.00	462.00	P&M-060
		<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				3516.69	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				3868.36	
		Cost for 15 cum = a+b+c+d+e				42552.01	
		<b>Rate per cum = (a+b+c+d+e)/15</b>				2836.80	
					<i>say</i>	<u>2837.00</u>	
		<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 .					
		<i>Unit = metre</i>					
		<i>Taking output = 12.5 metres ( 5 pipes of 2.5 m length each )</i>					
		<b>A 1000 mm dia</b>					
		<b>a) Labour</b>					
		Mate	day	0.180	171.00	30.78	L-12
		Mason	day	0.500	213.00	106.50	L-11
		Mazdoor	day	4.000	157.00	628.00	L-13
		<b>b) Material</b>					
		Sand at site	cum	0.070	133.28	9.33	M-005
		Cement at site	tonne	0.050	5462.00	273.10	M-081
		RCC pipe NP-4 /prestressed concrete pipe including collar at site	metre	12.500	2811.63	35145.38	M-149
		Granular material passing 5.6 mm sieve for bedding	cum	4.500	127.69	574.61	M-009
		<b>c) Overhead charges @ 0.1 on (a+b)</b>				3676.77	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				4044.45	
		Cost for 12.5 metres = a+b+c+d				44488.90	
		<b>Rate per metre = (a+b+c+d)/12.5</b>				3559.11	
					<i>say</i>	<u>3559.00</u>	
		<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 .

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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	1200 mm dia					
		a) Labour					
		Mate	day	0.280	171.00	47.88	L-12
		Mason	day	1.000	213.00	213.00	L-11
		Mazdoor	day	6.000	157.00	942.00	L-13
		b) Material					
		Sand at site	cum	0.090	133.28	12.00	M-005
		Cement at site	tonne	0.070	5462.00	382.34	M-081
		RCC pipe NP-4/prestressed concrete pipe including collar at site	metre	12.500	3997.25	49965.63	M-150
		Granular material passing 5-6 mm sieve for class bedding	cum	5.000	127.69	638.45	M-009
		c) Overhead charges @ 0.1 on (a+b)				5220.13	
		d) Contractor's profit @ 0.1 on (a+b+c)				5742.14	
		Cost for 12.5 metres = a+b+c+d				63163.56	
		Rate per metre= (a+b+c+d)/12.5				5053.08	
					<i>say</i>	<u>5053.00</u>	
	Note	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	Laying Reinforced Cement Concrete Pipe NP4 / Prestressed Concrete Pipe on First Class Bedding in Double Row .					
		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 .					
		<i>Unit = metre</i>					
		<i>Taking output = 12.5 metres ( 10 pipes of 2.5 m length each in two rows.)</i>					
	A	1000 mm dia					
		a) Labour					
		Mate	day	0.360	171.00	61.56	L-12
		Mason	day	1.000	213.00	213.00	L-11
		Mazdoor	day	8.000	157.00	1256.00	L-13
		b) Material					
		Sand at site	cum	0.140	133.28	18.66	M-005
		Cement at site	tonne	0.100	5462.00	546.20	M-081
		RCC pipe NP-4/prestressed concrete pipe including collar at site	metre	25.000	2811.63	70290.75	M-149
		Granular material passing 5.6 mm sieve for bedding	cum	12.500	127.69	1596.13	M-009
		c) Overhead charges @ 0.1 on (a+b)				7398.23	
		d) Contractor's profit @ 0.1 on (a+b+c)				8138.05	
		Cost for 12.5 metres = a+b+c+d				89518.58	
		Rate per metre = (a+b+c+d)/12.5				7161.49	
	Note	1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added .					
					<i>say</i>	<u>7161.00</u>	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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	1200 mm dia					
		a) Labour					
		Mate	day	0.560	171.00	95.76	L-12
		Mason	day	2.000	213.00	426.00	L-11
		Mazdoor	day	12.000	157.00	1884.00	L-13
		b) Material					
		Sand at site	cum	0.180	133.28	23.99	M-005
		Cement at site	tonne	0.140	5462.00	764.68	M-081
		RCC pipe NP-4 /prestressed concrete pipe including collar at site	metre	25.000	3997.25	99931.25	M-150
		Granular material passing 5-6 mm sieve for class bedding	cum	13.750	127.69	1755.74	M-009
		c) Overhead charges @ 0.1 on (a+b)				10488.14	
		d) Contractor's profit @ 0.1 on (a+b+c)				11536.96	
		Cost for 12.5 metres = a+b+c+d				126906.52	
		Rate per metre= (a+b+c+d)/12.5				10152.52	
	Note	1. In case of cement cradle bedding, quantity of PCC M15 is to be calculated as per design and priced separately and added .			say	<u>10153.00</u>	
		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					

## 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.

## Summary of Rate Analysis

### CHAPTER-10 MAINTENANCE OF ROADS

Item No.	Descriptions	Unit	Rate (in Rs.)
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	94.00
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	72.00
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	24.00
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	145.00
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	371.00
(ii)	<b>for grading II Material</b>	sqm	370.00
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	3.80
10.7	<b>Dusting</b> (Applying crusher dust to areas of road where bleeding of excess bitumen has occurred.)	sqm	0.31
10.8 A	<b>Fog Seal</b> (ref item 5.17)	sqm	39.98
<b>B</b>	<b>Crack Prevention courses.</b> (ref item 5.21)		
(i)	<b>Stress Absorbing Membrane (SAM) crack width less than 6 mm</b>	sqm	55.00
(ii)	<b>Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm</b>	sqm	68.00
(iii)	<b>Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 %</b>	sqm	90.00
(iv)	<b>Bitumen Impregnated Geotextile</b>	sqm	165.00
<b>C</b>	<b>Slurry Seal</b> (ref item 5.15)		
(i)	<b>5 mm thickness</b>	sqm	67.00
(ii)	<b>3 mm thickness</b>	sqm	47.00
(iii)	<b>1.5 mm thickness</b>	sqm	29.10
<b>D</b>	<b>Surface Dressing for maintance works.</b> (ref item 5.9)		
(i)	<b>19 mm nominal chipping size</b>	sqm	80.00
(ii)	<b>13 mm nominal size chipping</b>	sqm	68.00
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	664.00
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	16.00
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	20.70
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	97.00
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	254.00
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	6.80
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!

## Analysis of Rate

### CHAPTER- 10 MAINTENANCE OF ROADS

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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>					
		a) Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		b) Machinery					
		Excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.130	1646.00	213.98	P&M-026
		Tipper ( L is average lead in km for borrow earth)	tonne.km	12 x L	3.00	36.00	Lead =1 km & P&M-058
		Add 10 per cent of cost of carriage towards loading and unloading charges.				3.60	
		Plate compactor	hour	0.500	392.00	196.00	P&M-086
		c) Overhead charges @ 0.1 on (a+b)				77.73	
		d) Contractor's profit @ 0.1 on (a+b+c)				85.50	
		Cost for 10 cum = a+b+c+d				940.48	
		Rate per cum = (a+b+c+d)/10				94.05	
					<b>say</b>	<b>94.00</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					
		a) Labour					
		Mate	day	0.180	171.00	30.78	L-12
		Mazdoor	day	4.500	157.00	706.50	L-13
		b) Machinery					
		Excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.250	1646.00	411.50	P&M-026
		Tipper ( L is average lead in km for borrow earth)	tonne.km	24xL	3.00	72.00	Lead =1 km & P&M-058
		Add 10 per cent of cost of transportation to cover cost of loading and unloading				7.20	
		Plate compactor @ 25 sqm per hour	hour	12.000	392.00	4704.00	P&M-086
		c) Overhead charges @ 0.1 on (a+b)				593.20	
		d) Contractor's profit @ 0.1 on (a+b+c)				652.52	
		Cost for 100 sqm = a+b+c+d				7177.70	
		Rate per sqm = (a+b+c+d)/100				71.78	
					<b>say</b>	<b>72.00</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					
		a) Labour					
		Mate	day	0.100	171.00	17.10	L-12
		Mazdoor	day	2.500	157.00	392.50	L-13



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Machinery					
		Plate compactor @ 25 sqm per hour	hour	4.000	392.00	1568.00	P&M-086
		c) Overhead charges @ 0.1 on (a+b)				197.76	
		d) Contractor's profit @ 0.1 on (a+b+c)				217.54	
		Cost for 100 sqm = a+b+c+d				2392.90	
		Rate per sqm on = (a+b+c+d)100				23.93	
					<i>say</i>	<u>24.00</u>	
		<b>Note</b> The earth stripped from earthen shoulders to be dumped on the side slopes locally for disposal.					
10.4	3004.2	Filling Pot-holes and Patch Repairs with open-Graded Premix surfacing, 20mm.					
		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					
		<i>Unit = Sqm</i>					
		<i>Taking out put = 10250 sqm (205 cum)(405 tonne)</i>					
		a) Labour					
		Mate	Day	3.760	171.00	642.96	L-12
		Mazdoor	Day	90.000	157.00	14130.00	L-13
		Mazdoor skilled	Day	4.000	200.00	800.00	L-15
		b) Machinery					
		Air compressor 250 cfm	hour	6.000	405.00	2430.00	P&M-001
		HMP 100-110 TPH Capacity	hour	6.000	29942.00	179652.00	P&M-022
		Tipper 10 tonnes capacity	hour	45.000	787.00	35415.00	P&M-048
		Smooth wheeled roller 8-10 tonnes	hour	12.000	604.00	7248.00	P&M-044
		c) Material					
		Crushed stone aggregates nominal size 13.2mm @ 0.18 cum per 10 sqm	cum	184.500	617.12	113858.64	M-052
		Crushed stone aggregates nominal size 11.2mm @ 0.09 cum/10 sqm	cum	92.250	589.97	54424.73	M-051
		Bitumen 80/100 @ 14.6 kg per 10 sqm	tonne	14.970	47544.90	711747.15	M-075
		Bitumen emulsion for tack coat including vertical sides of pot hole.	tonne	2.460	43116.00	106065.36	M-077
		d) Overhead charges @ 0.1 on (a+b+c)				122641.38	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				134905.52	
		Cost for 10250 sqm = a+b+c+d+e				1483960.75	
		Rate per sqm = (a+b+c+d+e)/10250				144.78	
					<i>say</i>	<u>145.00</u>	
10.5	3004.2	Filling Pot-holes and Patch Repairs with Bituminous concrete, 40mm.					
		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>Unit = Sqm</i>					
		<i>Taking out put = 4900 sqm (196 cum)(450 Tonnes)</i>					
		a) Labour					
		Mate	Day	2.920	171.00	499.32	L-12
		Mazdoor	Day	70.000	157.00	10990.00	L-13
		Mazdoor skilled	Day	3.000	200.00	600.00	L-15
		b) Machinery					
		Air compressor 250 cfm	hour	6.000	405.00	2430.00	P&M-001

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		HMP 100-110 TPH Capacity	hour	6.000	29942.00	179652.00	P&M-022
		Tipper 10 tonnes capacity	hour	45.000	787.00	35415.00	P&M-048
		Smooth wheeled roller 8-10 tonnes	hour	12.000	604.00	7248.00	P&M-044
		<b>c) Material</b>					
		i) Bitumen	tonne	22.500	47544.90	1069760.25	M-075
		ii) Bitumen emulsion for tack coat .	tonne	1.180	43116.00	50876.88	M-077
		iii) Aggregates					
		<b>Grading I - 19mm(Nominal size)</b>					
		20-10mm 35 per cent	cum	99.750	617.12	61557.72	M-045
		10-5 mm 23 per cent	cum	65.550	508.74	33347.91	M-025,M-040
		5mm and below 40 per cent	cum	114.000	195.72	22312.08	M-030
		Filler 2 per cent by weight of aggregate	tonne	8.620	3069.00	26454.78	M-188
		Add 5 per cent for wastage				1322.74	
		or					
		<b>Grading-II 13mm (Nominal size)</b>					
		13.2-10 mm 30 per cent	cum	85.500	617.12	52763.76	M-044
		10-5 mm 25 per cent	cum	71.250	508.74	36247.73	M-025
		5 mm and Below 43 per cent	cum	122.550	195.72	23985.49	M-030
		Filler 2 per cent	tonne	8.620	3069.00	26454.78	M-188
		Add 5 per cent for wastage				1322.74	
		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)	for grading I Material					
		d) Overhead charges @ 0.1 on (a+b+c)				150246.67	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				165271.33	
		Cost for 4900 cum = a+b+c+d+e				1817984.68	
		Rate per cum = (a+b+c+d+e)/4900				371.02	
					<i>say</i>	<u>371.00</u>	
10.5	(ii)	for grading II Material					
		d) Overhead charges @ 0.1 on (a+b+c)				149824.59	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				164807.05	
		Cost for 4900 cum = a+b+c+d+e				1812877.59	
		Rate per cum = (a+b+c+d+e)/4900				369.98	
						<i>say</i>	<u>370.00</u>
	Note	For detailed working of quantities of aggregates, refer item 5.8 of chapter 5					
10.6	3004.3.3	Crack Filling					
		Filling of crack using slow - curing bitumen emulsion and applying crusher dust in case crack are wider than 3mm.					
		<i>Unit = Running Meter</i>					
		<i>Taking out put = 500m</i>					
		a) Labour					
		Mate	day	0.040	171.00	6.84	L-12
		Mazdoor	day	1.000	157.00	157.00	L-13
		b) Material					
		Slow-curing bitumen emulsion	Kg	33.000	43.12	1422.83	M-077
		Stone crusher dust	cum	0.020	92.57	1.85	M-021
		c) Overhead charges @ 0.1 on (a+b)				158.85	
		d) Contractor's profit @ 0.1 on (a+b+c)				174.74	
		Cost for 500sqm = a+b+c+d				1922.11	
		Rate per meter = (a+b+c+d+e)/500				3.84	
						<i>say</i>	<u>3.80</u>
10.7	3004.4	Dusting					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Applying crusher dust to areas of road where bleeding of excess bitumen has occurred.					
		<i>Unit = Sqm</i>					
		<i>Taking output = 3500 sqm</i>					
		a) Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		b) Material					
		Stone crusher dust finer than 3mm with not more than 10 per cent passing 0.075 sieve.	cum	6.250	92.57	578.56	M-021
		c) Overhead charges @ 0.1 on (a+b)				90.62	
		d) Contractor's profit @ 0.1 on (a+b+c)				99.69	
		Cost for 3500sqm = a+b+c+d				1096.55	
		Rate per meter = (a+b+c+d)/3500				0.31	
					<i>say</i>	<u>0.31</u>	
10.8	(A) 3004.3.2	Fog Seal	sqm			39.98	Item 5.17
	(B) 3004.3.4	Crack Prevention courses.					
		(i) Stress Absorbing Membrane (SAM) crack width less than 6 mm	sqm			55.00	Item 5.21 Case-I
		(ii) Stress Absorbing Membrane (SAM) with crack width 6 mm to 9 mm	sqm			68.00	Item 5.21 Case-II
		(iii) Stress Absorbing Membrane (SAM) crack width above 9 mm and cracked area above 50 per cent	sqm			90.00	Item 5.21 Case-III
		(iv) Bitumen Impregnated Geotextile	sqm			165.00	Item 5.21 Case-IV
10.8	(C) 3004.5	Slurry Seal					
		(i) 5 mm thickness	sqm			67.00	Item 5.15 Case-I
		(ii) 3 mm thickness	sqm			47.00	Item 5.15 Case-II
		(iii) 1.5 mm thickness	sqm			29.10	Item 5.15 Case-III
10.8	(D) 3004.6	Surface Dressing for maintenance works.					
		(i) 19 mm nominal chipping size	sqm			80.00	Item 5.9 Case-I
		(ii) 13 mm nominal size chipping	sqm			68.00	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					
		<i>Unit = running metre</i>					
		<i>Taking output = 10 metres</i>					
		a) Labour					
		Mate	day	0.040	171.00	6.84	L-12
		Mazdoor	day	0.500	157.00	78.50	L-13
		Chiseller	day	0.500	200.00	100.00	L-05
		b) Material					
		Epoxy primer	kg	2.500	12.00	30.00	M-097
		Epoxy compound with accessories for preparing epoxy mortar	kg	10.000	525.00	5250.00	M-095
		c) Machinery					
		Air compressor 250 cfm for cleaning	hour	0.050	405.00	20.25	P&M-001
		d) Overhead charges @ 0.1 on (a+b+c)				548.56	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Contractor's profit @ 0.1 on (a+b+c+d)				603.41	
		Cost for 10 metres = a+b+c+d+e				6637.56	
		Rate per metre = (a+b+c+d+e)/10				663.76	
					<i>say</i>	<u>664.00</u>	
10.10	3005.2	Repair of old Joints Sealant					
		Removal of existing sealant and re sealing of contraction, longitudinal or expansion joints in concrete pavement with fresh sealant material					
		<i>Unit = running metre</i>					
		<i>Taking output = 10 metres</i>					
		a) Labour					
		Mate	day	0.040	171.00	6.84	L-12
		Mazdoor	day	0.500	157.00	78.50	L-13
		b) Material					
		Primer	kg	0.250	12.00	3.00	M-146
		Sealant	kg	1.000	24.00	24.00	M-120
		c) Machinery					
		Air compressor 250 cfm for cleaning	hour	0.050	405.00	20.25	P&M-001
		d) Overhead charges @ 0.1 on (a+b+c)				13.26	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				14.58	
		Cost for 10 metres = a+b+c+d+e				160.43	
		Rate per metre = (a+b+c+d+e)/10				16.04	
					<i>say</i>	<u>16.00</u>	
10.11	3000	Hill Side Drain Clearance					
		Removal of earth from the choked hill side drain and disposing it on the valley side manually					
		<i>Unit = running metre</i>					
		<i>Taking output = 10 metres</i>					
		Assuming muck causing choking of drain to be 0.2 cum per metre, quantity of earth to be removed for 10 metres = 2 cum					
		a) Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	1.000	157.00	157.00	L-13
		b) Overhead charges @ 0.1 on (a+b)				17.07	
		c) Contractor's profit @ 0.1 on (a+b)				18.77	
		Cost for 10 metres = a+b+c				206.52	
		Rate per metre = (a+b+c)/10				20.65	
					<i>say</i>	<u>20.70</u>	
10.12	3000	Land Slide Clearance in soil					
		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					
		<i>Unit = cum</i>					
		<i>Taking output = 100 cum</i>					
		a) Labour					
		Mate	day	0.040	171.00	6.84	L-12
		Mazdoor	day	1.000	157.00	157.00	L-13
		b) Machinery					
		Dozer 80 HP @ 60 cum per hour	hour	1.670	4704.00	7855.68	P&M-014
		c) Overhead charges @ 0.1 on (a+b)				801.95	
		d) Contractor's profit @ 0.1 on (a+b+c)				882.15	
		Cost for 100 cum = a+b+c+d				9703.62	
		Rate per cum = (a+b+c+d)/100				97.04	
					<i>say</i>	<u>97.00</u>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Note	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.					
			<i>Unit = cum</i>					
			<i>Taking output = 100 cum</i>					
		a)	Labour					
			Mate	day	0.090	171.00	15.39	L-12
			Mazdoor	day	1.500	157.00	235.50	L-13
			Driller	day	0.750	190.00	142.50	L-06
			Blaster	day	0.070	264.00	18.48	L-03
		b)	Machinery					
			Dozer D 80 A-12,180 HP @ 60 cum per hour	hour	1.670	4704.00	7855.68	P&M-014
			Air compressor 250 cfm with two jack hammer	hour	2.500	405.00	1012.50	P&M-001
		c)	Materials					
			Gelatine 80 per cent @ 35 kg per 100 cum	kg	17.500	643.63	11263.44	M-104
			Electric Detonators @ 1 Detonator for 2 Gelatine sticks of 125 gms each	each	70.000	6.00	420.00	M-094 /100
		c)	Overhead charges @ 0.1 on (a+b)				2096.35	
		d)	Contractor's profit @ 0.1 on (a+b+c)				2305.98	
			Cost for 100 cum = a+b+c+d+e				25365.82	
			Rate per cum = (a+b+c+d+e)/100				253.66	
							<i>say</i> <b>254.00</b>	
		Note	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					
			<i>Unit = cum</i>					
			<i>Taking output = 5000 cum</i>					
		a)	Labour					
			Mate	day	0.080	171.00	13.68	L-12
			Mazdoor	day	2.000	157.00	314.00	L-13
		b)	Machinery					
			Dozer D 80 A-12,180 HP @ 850 cum per hour	hour	5.880	4704.00	27659.52	P&M-014
		c)	Overhead charges @ 0.1 on (a+b)				2798.72	
		d)	Contractor's profit @ 0.1 on (a+b+c)				3078.59	
			Cost for 5000 cum = a+b+c+d				33864.51	
			Rate per cum = (a+b+c+d)/5000				6.77	
							<i>say</i> <b>6.80</b>	
		Note	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.					
			<i>Unit = cum</i>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<i>Taking output = 3600 cum</i>					
		a) Labour					
		Mate	day	0.080	171.00	13.68	L-12
		Mazdoor	day	2.000	157.00	314.00	L-13
		b) Machinery					
		Snow blower equipment 140 HP @ 600 cum per hour	hour	6.000	input	#VALUE!	P&M-087
		c) Overhead charges @ 0.1 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Cost for 3600 cum (a+b+c+d)				#VALUE!	
		Rate per cum = (a+b+c+d)/3600				#VALUE!	
					<i>say</i>	<u>#VALUE!</u>	

## 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.

## Summary of Rate Analysis

### CHAPTER-11 HORTICULTURE

Item No.	Descriptions	Unit	Rate (in Rs.)
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	13.20
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	9.30
(ii)	<b>In rows 7.5 cm apart in either direction</b>	sqm	15.50
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	10.80
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	297.00
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	16.60
11.6	<b>Maintenance of Lawns with Fine Grassing for the First Year</b>	sqm	225.00
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	324.00
(b)	<b>Maintenance of Hedge for one year</b>	metre	196.00
11.8	<b>a) Planting Flowering Plants and Shrubs in Central Verge</b>	km	87246.00
(b)	<b>Maintenance of Flowering Plants and Shrubs in Central Verge for one Year</b>	km	153033.00
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	830.00
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	15.00
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	817.00
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)	each	1748.00
11.15	<b>Edging with 2nd class Bricks, laid dry lengthwise (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>	metre	36.40
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	436.00
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	875.00



## Summary of Rate Analysis

<b>11.18</b>	<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	6975.00
<b>11.19</b>	<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	1797.00
<b>11.20</b>	<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	2370.00
<b>11.21</b>	<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	119785.00

## Analysis of Rate

### CHAPTER-11 HORTICULTURE

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
11.1	307	Spreading of Sludge Farm Yard Manure or/and good Earth					
		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)					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Labour					
		Mate	day	0.040	171.00	6.84	L-12
		Mazdoor	day	1.000	157.00	157.00	L-13
		b) Overhead charges @ 0.1 on (a)				16.38	
		c) Contractor's profit @ 0.1 on (a+b)				18.02	
		Cost for 15 cum= a+b+c				198.25	
		Rate per cum = (a+b+c)/15				13.22	
					<i>say</i>	<u>13.20</u>	
11.2	307	Grassing with 'Doobs' Grass					
		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>Unit = sqm</i>					
		<i>Taking output = 100 sqm</i>					
		(i) In rows 15 cm apart in either direction					
		a) Labour					
		Mate	day	0.170	171.00	29.07	L-12
		Mazdoor for grassing	day	0.750	157.00	117.75	L-13
		Mazdoor for maintenance for 30 days	day	1.000	157.00	157.00	L-13
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.500	154.00	77.00	P&M-060
		c) Material					
		Doob grass	kg	100.000	3.89	389.00	M-112
		d) Overhead charges @ 0.1 on (a+b+c)				76.98	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				84.68	
		Cost for 100 sqm = a+b+c+d+e				931.48	
		Rate per sqm= (a+b+c+d+e)/100				9.31	
					<i>say</i>	<u>9.30</u>	
11.2		(ii) In rows 7.5 cm apart in either direction					
		a) Labour					
		Mate	day	0.220	171.00	37.62	L-12
		Mazdoor for grassing.	day	1.250	157.00	196.25	L-13
		for maintenance for 30 days	day	1.000	157.00	157.00	L-13
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.750	154.00	115.50	P&M-060
		c) Material					
		Doob grass	kg	200.000	3.89	778.00	M-112
		d) Overhead charges @ 0.1 on (a+b+c)				128.44	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				141.28	
		Cost for 100 sqm = a+b+c+d+e				1554.09	
		Rate per sqm = (a+b+c+d+e)/100				15.54	
					<i>say</i>	<u>15.50</u>	
		Note					
		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	Making Lawns including Ploughing and Dragging with 'Swagha' Breaking of Clod					
		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					
		<i>Unit = sqm</i>					
		<i>Taking output = 100 sqm</i>					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.150	171.00	25.65	L-12
		Mazdoor for preparation of ground	day	0.500	157.00	78.50	L-13
		Mali for fetching doobs grass roots and grassing at 15 cm apart	day	1.000	200.00	200.00	L-09
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.500	154.00	77.00	P&M-060
		Tractor with filler	hour	0.010	459.00	4.59	P&M-053
		c) Material					
		Supply of farm yard manure at site of work	cum	0.180	675.00	121.50	M-167
		Fine grass	kg	100.000	3.89	389.00	M-113
		d) Overhead charges @ 0.1 on (a+b+c)				89.62	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				98.59	
		Cost for 100 sqm = a+b+c+d+e				1084.45	
		Rate per sqm = (a+b+c+d+e)/100				10.84	
					<i>say</i>	<u>10.80</u>	
11.4	307	Maintenance of Lawns or Turfing of Slopes					
		Maintenance of lawns or Turfing of slopes (rough grassing) for a period of one year including watering etc					
		<i>Unit = sqm</i>					
		<i>Taking output = 100 sqm</i>					
		a) Labour					
		Mali	day	10.000	200.00	2000.00	L-09
		b) Machinery					
		Water tanker 6 KL capacity	hour	15.000	154.00	2310.00	P&M-060
		c) Material					
		Cost of water	KL	90.000	225.00	20250.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				2456.00	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				2701.60	
		Cost for 100 sqm = a+b+c+d+e				29717.60	
		Rate per sqm = (a+b+c+d+e)/100				297.18	
					<i>say</i>	<u>297.00</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					
		<i>Unit = sqm</i>					
		<i>Taking output = 100 sqm</i>					
		a) Labour					
		Mate	day	0.250	171.00	42.75	L-12
		Mazdoor for preparation of ground	day	1.000	157.00	157.00	L-13
		Mali for fetching doobs grass roots hedges and grassing at 10 cm apart	day	1.500	200.00	300.00	L-09
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.500	154.00	77.00	P&M-060
		Tractor with tiller	hour	0.010	459.00	4.59	P&M-053
		c) Material					
		Supply of farm yard manure at site of work @ 0.6 cum per 100 sqm	cum	0.600	675.00	405.00	M-167
		Fine grass	kg	100.000	3.89	389.00	M-113
		d) Overhead charges @ 0.1 on (a+b+c)				137.53	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				151.29	
		Cost for 100 sqm = a+b+c+d+e				1664.16	
		Rate per sqm = (a+b+c+d+e)/100				16.64	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					<i>say</i>	<u>16.60</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					
		<i>Unit = sqm</i>					
		<i>Taking output = 100 sqm</i>					
		a) Labour					
		Mali	day	10.000	200.00	2000.00	L-09
		b) Machinery					
		Water tanker 6 KL capacity	hour	20.000	154.00	3080.00	P&M-060
		c) Material					
		Cost of water	KL	60.000	225.00	13500.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				1858.00	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				2043.80	
		Cost for 100 sqm = a+b+c+d+e				22481.80	
		Rate per sqm = (a+b+c+d+e)/100				224.82	
					<i>say</i>	<u>225.00</u>	
11.7	307	Planting and Maintaining of Permanent Hedges					
		(a) Planting permanent hedges including digging of trenches					
		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					
		<i>Unit = Running metre</i>					
		<i>Taking output = 100metre</i>					
		a) Labour					
		Mate	day	1.400	171.00	239.40	L-12
		Mazdoor for digging of trench 60 cm wide and 45 cm deep	day	10.000	157.00	1570.00	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	157.00	628.00	L-13
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.500	154.00	77.00	P&M-060
		c) Material					
		Cost of hedge plants 2 rows at 30 cm apart	each	2x340	30.00	20400.00	M-116
		Supply of farm yard manure at site of work	cum	4.670	675.00	3152.25	M-167
		Pesticide	kg	0.250	68.40	17.10	M-136
		Cost of water	KL	3.000	225.00	675.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				2675.88	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				2943.46	
		Cost for 100 metres = a+b+c+d+e				32378.09	
		Rate per metre = (a+b+c+d+e)/100				323.78	
					<i>say</i>	<u>324.00</u>	
		(b) Maintenance of hedge for one year					
		<i>Unit = Running metre</i>					
		<i>Taking output = 100 m</i>					
		a) Labour					
		Mate	day	3.000	171.00	513.00	L-12
		Mazdoor	day	30.000	157.00	4710.00	L-13
		b) Machinery					
		Water tanker 6 KL capacity	hour	5.000	154.00	770.00	P&M-060

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Material					
		Manure sludge/Farm yard manure	cum	2.000	675.00	1350.00	M-167
		Pesticide	kg	0.500	68.40	34.20	M-136
		Cost of water	KL	30.000	225.00	6750.00	M-189
		Cost of hedge plants @ 10 per cent casualty	each	68.000	30.00	2040.00	M-116
		d) Overhead charges @ 0.1 on (a+b+c)				1616.72	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1778.39	
		Cost for 100 metres = a+b+c+d+e				19562.31	
		Rate per metre = a+b+c+d+e)/100				195.62	
					<i>say</i>	<u>196.00</u>	
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	171.00	205.20	L-12
		Mazdoor	day	12.000	157.00	1884.00	L-13
		b) Machinery					
		Water tanker 6 KL capacity	hour	6.000	154.00	924.00	P&M-060
		c) Material					
		Plants	each	200.000	30.00	6000.00	M-100
		Shrubs	each	800.000	15.00	12000.00	M-166
		Manure sludge/Farm yard manure	cum	63.640	675.00	42957.00	M-167
		Pesticide	kg	0.500	68.40	34.20	M-136
		Cost of water	KL	36.000	225.00	8100.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				7210.44	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				7931.48	
		Rate per Km = (a+b+c+d+e)				87246.32	
					<i>say</i>	<u>87246.00</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	171.00	6156.00	L-12
		Mazdoor	day	365.000	157.00	57305.00	L-13
		b) Machinery					
		Water tanker 6 KL capacity	hour	90.000	154.00	13860.00	P&M-060
		c) Material					
		Manure Sludge / farm yard manure at site	cum	10.000	675.00	6750.00	M-167
		Cost of water	KL	180.000	225.00	40500.00	M-189
		Replacement of casualties @ 10 per cent					
		Plants	each	20.000	30.00	600.00	M-100
		Shrubs	each	80.000	15.00	1200.00	M-166
		Pesticides	kg	1.500	68.40	102.60	M-136
		d) Overhead charges @ 0.1 on (a+b+c)				12647.36	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				13912.10	
		Rate per Km for one year = (a+b+c+d+e)				153033.06	
					<i>say</i>	<u>153033.00</u>	
11.9	307	Planting of Trees and their Maintenance for one Year					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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					
		<i>Unit = Each</i>					
		<i>Taking output = 10 trees</i>					
		a) Labour					
		Mate	day	1.700	171.00	290.70	L-12
		Mazdoor for planting	day	2.000	157.00	314.00	L-13
		Mazdoor for maintenance for one year	day	15.000	157.00	2355.00	L-13
		b) Machinery					
		Water tanker 6 KL capacity	hour	2.000	154.00	308.00	P&M-060
		c) Material					
		Sapling 2 m high 25 mm dia	each	10.000	22.50	225.00	M-160
		Farm yard manure	cum	0.940	675.00	634.50	M-167
		Pesticide	kg	0.500	68.40	34.20	M-136
		Cost of water	KL	12.000	225.00	2700.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				686.14	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				754.75	
		Cost for 10 trees = a+b+c+d+e				8302.29	
		Rate per trees = (a+b+c+d+e)/10				830.23	
					<i>say</i>	<u>830.00</u>	
11.10	308	Renovation Lawns including, Weeding, Forking the Ground, Top Dressing with Forked Soil					
		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					
		<i>Unit = sqm</i>					
		<i>Taking output = 100 sqm</i>					
		a) Labour					
		Mate	day	0.120	171.00	20.52	L-12
		Mazdoor	day	3.000	157.00	471.00	L-13
		b) Machinery					
		Water tanker 6 KL capacity	hour	0.500	154.00	77.00	P&M-060
		c) Material					
		Cost of water	KL	3.000	225.00	675.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				124.35	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				136.79	
		Cost for 100 sqm = a+b+c+d+e				1504.66	
		Rate per sqm = (a+b+c+d+e) / 100				15.05	
					<i>say</i>	<u>15.00</u>	
11.11	308.2	Supply at Site Well Decayed Farm Yard Manure					
		Supply at site of work well decayed farm yard manure, from any available source, approved by the engineer in charge including screening and stacking					
		<i>Unit = cum</i>					
		<i>Taking output = one cum</i>					
		a) Material					
		a) Cost of well decayed farm yard manure duly screened, loading, carriage, unloading and stacking at site	cum	1.000	675.00	675.00	M-167
		b) Overhead charges @ 0.1 on (a)				67.50	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Contractor's profit @ 0.1 on (a+b)				74.25	
		Rate per cum = (a+b+c)				816.75	
						<u>817.00</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) Contractors 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) Contractors 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 diametre 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 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					
		<i>Unit = Each</i>					
		<i>Taking output = one tree guard</i>					
		a) Labour					
		Mate	day	0.050	171.00	8.55	L-12
		Mason	day	0.250	213.00	53.25	L-11
		Mazdoor	day	0.250	157.00	39.25	L-13
		b) Material					
		Brick 2nd class including carriage	each	230.000	5.636	1296.28	M-079
		Cement mortar 1:6	cum	0.025	1899.00	47.48	Item 12.6 (D)
		c) Overhead charges @ 0.1 on (a+b)				144.48	
		d) Contractor's profit @ 0.1 on (a+b+c)				158.93	
		Rate per tree Guard = a+b+c+d				1748.21	
					say	<u>1748.00</u>	
11.15		New Edging with 2nd Class Bricks, Laid Dry Lengthwise					
		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	171.00	0.34	L-12
		Mason	day	0.050	213.00	10.65	L-11
		Mazdoor	day	0.050	157.00	7.85	L-13
		b) Material					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Brick 2nd class including carriage	each	50.000	5.636	281.80	M-079
		c) Overhead charges @ 0.1 on (a+b)				30.06	
		d) Contractor's profit @ 0.1 on (a+b+c)				33.07	
		Cost for 10 metre = a+b+c+d				363.78	
		Rate per metre = (a+b+c+d)/10				36.38	
					<i>say</i>	<u>36.40</u>	
11.16	New	Making Tree Guard 53 cm dia and 1.3 m High as per Design from Empty Bitumen Drums					
		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	171.00	3.42	L-12
		Blacksmith	day	0.150	213.00	31.95	L-02a
		Mazdoor	day	0.070	157.00	10.99	L-13
		b) Material					
		Empty bitumen drum	each	1.000	120.00	120.00	M-172
		MS sheet 50 x 0.5 mm	kg	0.650	44.879	29.17	M-179 /1000
		Rivets 6 mm dia and 10 mm in length	each	22.000	7.50	165.00	M-158
		c) Overhead charges @ 0.1 on (a+b)				36.05	
		d) Contractor's profit @ 0.1 on (a+b+c)				39.66	
		Rate for each tree guard = a+b+c+d				436.24	
					<i>say</i>	<u>436.00</u>	
11.17	New	Making Tree Guard 53 cm dia and 2 Metre High as per Design from Empty Bitumen Drums					
		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					
		<i>Unit = Each</i>					
		<i>Taking output = one tree guard</i>					
		a) Labour					
		Mate		0.040	171.00	6.84	L-12
		Blacksmith	day	0.200	213.00	42.60	L-02a
		Mazdoor		0.200	157.00	31.40	L-13
		b) Material					
		Empty bitumen drum	each	1.500	120.00	180.00	M-172
		MS sheet 50 x 0.5 mm	kg	0.650	44.879	29.17	M-179 /1000
		Rivets 6 mm dia and 10 mm in length	each	50.000	7.50	375.00	M-158
		MS plate 30 x 3 mm	kg	1.300	44.879	58.34	M-179 /1000
		c) Overhead charges @ 0.1 on (a+b)				72.34	
		d) Contractor's profit @ 0.1 on (a+b+c)				79.57	
		Rate for each tree guard = a+b+c+d				875.26	
					<i>say</i>	<u>875.00</u>	
11.18	New	Wrought Iron and Mild Steel Welded Work					



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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					
		<i>Unit = quintal</i>					
		<i>Taking output = one quintal</i>					
		a) Labour					
		Mate	day	0.450	171.00	76.95	L-12
		Blacksmith/ welder for cutting to design and shape and jointing	day	2.000	213.00	426.00	L-02a
		Mazdoor for fixing and helper for Blacksmith/welder	day	2.500	157.00	392.50	L-13
		b) Material					
		Angle, tees, channels etc	quintal	1.050	4487.94	4712.33	M-179 /10
		Deduct the cost of scrap	quintal	0.050	-1495.98	(74.80)	M-179/10/3
		Add 5 per cent of cost of material for welding rods and other welding accessories				231.88	
		c) Overhead charges @ 0.1 on (a+b)				576.49	
		d) Contractor's profit @ 0.1 on (a+b+c)				634.13	
		Rate per quintal = a+b+c+d				6975.48	
					<i>say</i>	<u>6975.00</u>	
11.19	New	Tree Guard with MS Iron					
		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.					
		<i>Unit = Each</i>					
		<i>Taking output = one tree guard</i>					
		a) Labour					
		Mate	day	0.050	171.00	8.55	L-12
		Blacksmith	day	0.250	213.00	53.25	L-02a
		Mazdoor	day	0.250	157.00	39.25	L-13
		b) Material					
		MS iron 25 x 6 mm	kg	19.200	44.879	861.68	M-179 /1000
		MS iron 25 x 3 mm	kg	9.600	44.879	430.84	M-179 /1000
		Add 5 per cent of cost of material for riveting, bolting and welding accessories					
		c) Machinery					
		Tractor-trolley	hour	0.040	459.00	18.36	P&M-053
		d) Painting					
		Painting two coats including priming	sqm	1.770	50.00	88.50	Item 8.9
		e) Overhead charges @ 0.1 on (a+b+c)				141.19	
		f) Contractor's profit @ 0.1 on (a+b+c+e)				155.31	
		Rate per tree guard =a+b+c+d+e+f				1796.94	
					<i>say</i>	<u>1797.00</u>	
	Note	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	Tree Guard with MS Angle Iron and Steel Wire					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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					
		<i>Unit = Each</i>					
		<i>Taking output = one tree guard</i>					
		<b>a) Labour</b>					
		Mate	day	0.050	171.00	8.55	L-12
		Blacksmith	day	0.250	213.00	53.25	L-02a
		Welder	day	0.250	239.00	59.75	L-02b
		Mazdoor	day	0.250	157.00	39.25	L-13
		<b>b) Material</b>					
		MS angle 30 x 30 x 3 mm	kg	13.500	44.879	605.87	M-179 /1000
		MS iron 25 x 3 mm	kg	18.000	44.879	807.83	M-179 /1000
		Steel wire 3 mm dia	kg	6.000	37.07	222.42	M-192
		Add 5 per cent of cost of material for riveting, bolting and welding accessories				81.81	
		<b>c) Machinery</b>					
		Tractor-trolley	hour	0.040	459.00	18.36	P&M-053
		<b>d) Painting</b>					
		Painting two coats including priming	sqm	1.500	50.00	75.00	Item 8.9
		<b>e) Overhead charges @ 0.1 on (a+b+c)</b>				189.71	
		<b>f) Contractor's profit @ 0.1 on (a+b+c+e)</b>				208.68	
		<b>Rate per tree guard = a+b+c+d+e+f</b>				2370.47	
					<i>say</i>	<u>2370.00</u>	
11.21	New	Compensatory Afforestation					
		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					
		<i>Unit = Hectare</i>					
		<i>Taking output = one hectare</i>					
		<b>a) Labour</b>					
		<b>i) Planting</b>					
		Mate	day	2.500	171.00	427.50	L-12
		Mazdoor	day	25.000	157.00	3925.00	L-13
		<b>ii) For Maintenance for one year</b>					
		Mate	day	5.000	171.00	855.00	L-12
		Mazdoor	day	50.000	157.00	7850.00	L-13
		<b>b) Machinery</b>					
		Dozer 80 HP @ 1000 sqm/hour	hour	10.000	2789.00	27890.00	P&M-015
		Water tanker 6 KL capacity (for planting)	hour	3.000	154.00	462.00	P&M-060
		Water tanker 6 KL capacity (for maintenance)	hour	25.000	154.00	3850.00	P&M-060
		<b>c) Material</b>					
		Sapling 1 to 1.5 m high 2 cm dia stem	each	290.000	18.00	5220.00	M-160 x 0.8
		Add 10 per cent of sapling	each	29.000	18.00	522.00	M-160 x 0.8
		Decayed farm yard/sludge manure (planting)	cum	60.900	675.00	41107.50	M-167
		Decayed farm yard/sludge manure (maintenance)	cum	4.000	675.00	2700.00	M-167
		Pesticides for planting	kg	0.500	68.40	34.20	M-136
		Pesticides for maintenance	kg	1.500	68.40	102.60	M-136
		Cost of water	KL	18.000	225.00	4050.00	M-189

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 0.1 on (a+b+c)				9899.58	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				10889.54	
		Rate per hectare = a+b+c+d+e				119784.92	
					<i>say</i>	<u>119785.00</u>	
		<b>Note</b> Cost of fencing to be provided as per size of plot and approved design, measured and paid separately					

## B. 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%

<b>Category 2</b> : Minor Bridges included in the Road Packages	20%
<b>Category 3</b> : 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.

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.

## **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 un-loading.
- b) In tonne km where lead is variable. The loading and unloading for such case, 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 do 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.

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.

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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.



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 leveling course below the pile cap is proposed with M 15 grade concrete.
17. Steel reinforcement for cement concrete works are required to be provided separately. The rate for the same has been analysed.
18. Appendix-4 of IRC:78-2000 may be referred regarding precautions to be taken during sinking of wells.
19. 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.
20. The concrete mix used in bottom plug shall have a 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.
21. Necessary safety precautions shall be taken for excavation on open foundations for which guidance may be taken from IS:3764.
22. A leveling course of 100 mm thickness in M 10 (1:3:6) shall be provided before laying open foundations.
23. In the case of open foundation, dewatering shall not be permitted from the time of placing of concrete up to 24 hours after placement.
24. 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.
25. 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.
26. 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.
27. The top of the bottom plug shall be at least 300 mm above top of curb.
28. No dewatering shall be carried out within 7 days of casting of bottom plug.
29. In case of cement concrete piles, the minimum grade of concrete shall be M 35 with minimum cement content of 400 kg/cum.
30. The top of the pile shall project 50 mm into the pile cap and reinforcement of pile shall be fully anchored in pile cap.
31. 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.
32. Guidance for piles is to be obtained from IS:2911.

33. 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.

## Summary of Rate Analysis

### CHAPTER-12 FOUNDATIONS

Item No.	Descriptions	Unit	Rate (in Rs.)
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	79.00
(ii)	<b>3 m to 6 m depth</b>	cum	101.00
(iii)	<b>Above 6 m depth</b>	cum	135.00
B	<b>Mechanical Means</b>		
(i)	<b>Depth upto 3 m</b>	cum	64.00
(ii)	<b>Depth 3 m to 6 m</b>	cum	73.00
(iii)	<b>Depth above 6m</b>	cum	88.00
II	<b>Ordinary rock (not requiring blasting)</b>		
A	<b>Manual Means</b>		
(i)	<b>Depth upto 3 m</b>	cum	113.00
B	<b>Mechanical Means</b>	cum	83.00
III	<b>Hard rock ( requiring blasting )</b>		
A	<b>Manual Means</b>	cum	580.00
IV	<b>Hard rock ( blasting prohibited )</b>		
A	<b>Mechanical Means</b>	cum	447.00
V	<b>Marshy soil</b>		
(i)	<b>upto 3 m depth</b>		
A	<b>Manual means</b>	cum	394.00
B	<b>Mechanical Means</b>	cum	132.00
VI	<b>Back Filling in Marshy Foundation Pits</b>	cum	323.00
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	255.00
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	3271.00
12.5	<b>Brick masonry work in cement mortar in foundation complete excluding pointing and plastering, as per drawing and technical specifications</b>		
(i)	<b>Rate for Brick Work in C. M. 1:2 in foundation</b>	cum	5778.00
(ii)	<b>Rate for Brick Work in C. M. 1:3 in foundation</b>	cum	5491.00
(iii)	<b>Rate for Brick Work in C. M. 1:4 in foundation</b>	cum	5296.00
(iv)	<b>Rate for Brick Work in C. M. 1:6 in foundation</b>	cum	5104.00
12.6 A	<b>Cement mortar1:3 (1cement :3 sand)</b>	cum	3074.00
B	<b>Cement mortar1:2 (1cement :2 sand)</b>	cum	3943.00
C	<b>Cement mortar1:4 (1cement :4 sand)</b>	cum	2482.00
D	<b>Cement mortar1:6 (1cement :6 sand)</b>	cum	1899.00
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	2680.00
(b)	<b>Random Rubble Masonry</b>	cum	2633.00
12.8	<b>Plain/Reinforced cement concrete in open foundation complete as per drawing and technical specifications</b>		
A	<b>PCC Grade M15</b>	cum	3733.00
B	<b>PCC Grade M20</b>	cum	4062.00

## Summary of Rate Analysis

C	RCC Grade M20		
Case I	Using concrete mixer	cum	4157.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4160.00
D	PCC Grade M25		
Case I	Using concrete Mixer	cum	4483.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4489.00
E	RCC Grade M25		
Case I	Using concrete Mixer	cum	4584.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4587.00
F	PCC Grade M30		
Case I	Using Concrete Mixer	cum	4519.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4521.00
G	RCC Grade M30		
Case I	Using Concrete Mixer	cum	4598.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4603.00
H	RCC Grade M35		
Case I	Using Concrete Mixer	cum	4695.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4699.00
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 @ Rs. 5526.40 for each Island.	each	48856.00
B	Assuming depth of water 4.0 m and height of island 4.5 m including Royalty for earth @ Rs. 19895.04 for each Island.	each	279567.00
C	Providing and constructing one span service road to reach island location from one pier location to another pier location including Royalty for earth @ Rs. 330.00 per m for service Road.	metre	2961.00
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	81953.00
12.11	Plain/Reinforced cement concrete, in well foundation complete as per drawing and technical specification		
A	Well curb		
(i)	RCC M20 Grade		
Case I	Using concrete mixer	cum	4798.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4802.00
(ii)	RCC M25 Grade		
Case I	Using concrete mixer	cum	5303.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5704.00
(iii)	RCC M35 Grade		
Case I	Using concrete mixer	cum	5470.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5894.00
B	Well steining		
(I)	PCC M15 Grade	cum	3949.00
(ii)	PCC M20 Grade	cum	4297.00
(iii)	RCC M20 Grade		
Case I	Using concrete mixer	cum	4398.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4401.00
(iv)	PCC M25 Grade		
Case I	Using concrete mixer	cum	4754.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4760.00
(v)	RCC M25 Grade		
Case I	Using concrete mixer	cum	4861.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5229.00
(vi)	PCC M30 Grade		

## Summary of Rate Analysis

Case I	Using concrete mixer	cum	4804.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4805.00
(vii)	RCC M30 Grade		
Case I	Using concrete mixer	cum	4888.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4893.00
(viii)	RCC M35 Grade		
Case I	Using concrete mixer	cum	5014.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5403.00
(ix)	RCC M40 Grade		5474.00
C	Bottom Plug		
(i)	PCC Grade M20		
Case I	Using Concrete Mixer	cum	4809.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4620.00
(ii)	PCC Grade M25		
Case I	Using Concrete Mixer	cum	5084.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4892.00
(iii)	PCC Grade M30		
Case I	Using Concrete Mixer	cum	5131.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4942.00
(iv)	PCC Grade M35		
Case I	Using Concrete Mixer	cum	5241.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	5049.00
D	Intermediate plug		
(I)	Grade M20 PCC		
Case I	Using Concrete Mixer	cum	4606.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4428.00
(ii)	Grade M25 PCC		
Case I	Using Concrete Mixer	cum	4868.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4687.00
(iii)	Grade M30 PCC		
Case I	Using Concrete Mixer	cum	4913.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4734.00
E	Top plug		
(i)	Grade M15 PCC		
Case I	Using Concrete Mixer	cum	3590.00
(ii)	Grade M20 PCC		
Case I	Using Concrete Mixer	cum	3906.00
(iii)	Grade M25 PCC		
Case I	Using Concrete Mixer	cum	4322.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4327.00
(iv)	Grade M30 PCC		
Case I	Using Concrete Mixer	cum	4367.00
Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump	cum	4368.00
F	Well cap		
(i)	RCC Grade M20		
Case I	Using concrete Mixer	cum	4110.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4112.00
(ii)	RCC Grade M25		
Case I	Using concrete Mixer	cum	4584.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4588.00
(iii)	RCC Grade M30		

## Summary of Rate Analysis

Case I	Using Concrete Mixer	cum	4598.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4602.00
(iv)	RCC Grade M35		
Case I	Using Concrete Mixer	cum	4695.00
Case II	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4699.00
(v)	RCC M40 Grade	cum	5164.00
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	5646.00
(ii)	Beyond 3m upto 10m depth	metre	8280.00
(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	10935.00
(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	20512.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	24614.00
(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	48733.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	58480.00
B	Clayey soil ( 6m dia. Well )		
(i)	Depth below bed level upto 3.0 M	metre	8292.00
(ii)	Beyond 3m upto 10m depth	metre	18956.00
(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	25035.00
b	Add for dewatering @ 5% of cost, if required.	metre	26287.00
(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	46958.00
b	Add 5% of cost for dewatering of the cost, if required	metre	61633.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	58698.00
(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	111565.00
b	Add 5% of cost for dewatering, if required	metre	140573.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	133879.00
C	Soft rock (6m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	20623.00
D	Hard rock (6m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	26413.00
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		
(i)	Depth below bed level upto 3.0 M	metre	8891.00
(ii)	Beyond 3m upto 10m depth	metre	12137.00
(iii)	Beyond 10m upto 20m		

## Summary of Rate Analysis

a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	16030.00
(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	30070.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour ) .	metre	36084.00
(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	71441.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	85730.00
B	Clayey soil ( 7m dia. Well )		
(I)	Depth below bed level upto 3.0 M	metre	12137.00
(ii)	Beyond 3m upto 10m depth	metre	20041.00
(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	26468.00
b	Add for dewatering @ 5% of cost, if required.	metre	27792.00
(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	49648.00
b	Add 5% of cost for dewatering on the cost, if required	metre	65163.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ) .	metre	62060.00
(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	117956.00
b	Add 5% of cost for dewatering, if required	metre	148624.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).		141547.00
C	Soft rock ( 7m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	20067.00
D	Hard rock ( 7m dia well )		
(i)	Depth upto 3 m	metre	30809.00
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	10914.00
(ii)	Beyond 3m upto 10m depth	metre	13558.00
(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	17906.00
(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	33587.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour ) .	metre	40305.00
(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	79799.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	95759.00
B	Clayey soil ( 8m dia. Well )		
(i)	Depth upto 3.0 M	metre	14842.00
(ii)	Beyond 3m upto 10m depth	metre	20602.00
(iii)	Beyond 10 m upto 20 m		

## Summary of Rate Analysis

a	Add 5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	27210.00
b	Add for dewatering @ 5% of cost, if required.	metre	28571.00
(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	51041.00
b	Add 5% of cost for dewatering on the cost, if required	metre	66991.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	63801.00
(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	121267.00
b	Add 5% of cost for dewatering, if required	metre	152797.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	145521.00
C	Soft rock ( 8m dia well )		
(i)	Depth in soft rock strata upto 3m	metre	22001.00
D	Hard rock ( 8m dia well )		
(i)	Depth in hard rock strata upto 3 m	metre	30845.00
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	10973.00
(ii)	Beyond 3m upto 10m depth	metre	14898.00
(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	19675.00
(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	36906.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	44287.00
(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	87686.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	105223.00
B	Clayey soil ( 9m dia. Well )		
(i)	Depth below bed level upto 3.0 M	metre	15584.00
(ii)	Beyond 3m upto 10m depth	metre	22239.00
(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	29371.00
b	Add for dewatering @ 5% of cost, if required.	metre	30840.00
(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	55093.00
b	Add 5% of cost for dewatering on the cost, if required	metre	72310.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	68867.00
(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	130895.00
b	Add 5% of cost for dewatering, if required	metre	164927.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	157073.00



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C	Soft rock ( 9m dia well )		
(i)	Depth upto 3m	metre	27996.00
D	Hard rock ( 9m dia well )		
(i)	Depth of hard rock strata upto 3 m	metre	36459.00
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	13477.00
(ii)	Beyond 3m upto 10m depth	metre	15644.00
(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	20660.00
(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	38751.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	46501.00
(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	92066.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	110480.00
B	Clayey soil (10m dia. Well )		
(i)	Depth below bed level upto 3.0 M	metre	16661.00
(ii)	Beyond 3m upto 10m depth	metre	21577.00
(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	28496.00
b	Add for dewatering @ 5% of cost, if required.	metre	29921.00
(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	53452.00
'b	Add 5% of cost for dewatering on the cost, if required	metre	70156.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	66815.00
(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	126993.00
b	Add 5% of cost for dewatering, if required	metre	160011.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).		152391.00
C	Soft rock (10m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	28615.00
D	Hard rock (10m dia well )		
(i)	Depth of hard rock strata upto 3 m	metre	43573.00
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	31761.00
(ii)	Beyond 3m upto 10m depth	metre	22846.00
(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	30171.00
(iv)	Beyond 20m upto 30 m		

## Summary of Rate Analysis

a	Add 7.5% for every additional meter depth of sinking over the rate of sinking for the previous meter	metre	56592.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	67910.00
(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	134453.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	161344.00
B	Clayey soil (11 m dia. Well )		
(i)	Depth from bed level upto 3.0 M	metre	27758.00
(ii)	Beyond 3m upto 10m depth	metre	44148.00
(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	58306.00
b	Add for dewatering @ 5% of cost, if required.	metre	61221.00
(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	109365.00
b	Add 5% of cost for dewatering on the cost, if required	metre	143541.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	136706.00
(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	259835.00
b	Add 5% of cost for dewatering, if required	metre	327392.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	311802.00
C	Soft rock (11m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	64132.00
D	Hard rock (11m dia well )		
(i)	Depth of hard rock upto 3 m	metre	98663.00
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 3.0 M	metre	64437.00
(ii)	Beyond 3m upto 10m depth	metre	70971.00
(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	93730.00
(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	175812.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	210974.00
(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	417703.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	501244.00
B	Clayey soil (12 m dia. Well )		
(i)	Depth below bed level upto 3.0 M	metre	68784.00
(ii)	Beyond 3m upto 10m depth	metre	112824.00
(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	149004.00

## Summary of Rate Analysis

b	Add for dewatering @ 5% of cost, if required.	metre	156454.00
(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	279491.00
b	Add 5% of cost for dewatering on the cost, if required	metre	366832.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	349364.00
(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	664029.00
b	Add 5% of cost for dewatering, if required	metre	836677.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	796835.00
C	Soft rock (12m dia well )		
(i)	Depth of soft rock strata upto 3m	metre	152548.00
D	Hard rock (12m dia well )		
(i)	Depth of hard rock strata upto 3 m	metre	232664.00
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 3.0 M	metre	14688.00
(ii)	Beyond 3m upto 10m depth	metre	15766.00
(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	20822.00
(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	39057.00
b	Add 20% of cost for Kentledge including supports, loading arrangement and Labour .	metre	46868.00
(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	92794.00
b	Add 20% of cost for Kentledge including supports, loading arrangement, and Labour etc.	metre	111353.00
B	Clayey soil (Twin D Type Well )		
(i)	Depth below bed level upto 3.0 M	metre	16936.00
(ii)	Beyond 3m upto 10m depth	metre	24002.00
(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	31699.00
b	Add for dewatering @ 5% of cost, if required.	metre	33284.00
(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	59459.00
b	Add 5% of cost for dewatering on the cost, if required	metre	78040.00
c	Add 25% of cost for Kentledge including supports, loading arrangement and Labour ).	metre	74324.00
(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	141268.00
b	Add 5% of cost for dewatering, if required	metre	177997.00
c	Add 20% of cost for Kentledge including supports, loading arrangement and Labour).	metre	169521.00
C	Soft rock (Twin D Type well )		
(i)	Depth of soft rock strata upto 3m	metre	34152.00

## Summary of Rate Analysis

<b>D</b>	<b>Hard rock (Twin D Type well )</b>		
<b>(i)</b>	<b>Depth of hard rock strata upto 3 m</b>	metre	46501.00
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	255.00
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	75216.00
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	6325.00
	B) With using Batching Plant	metre	6240.00
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	10190.00
	B) With using Batching Plant	metre	10039.00
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	12731.00
	B) With using Batching Plant	metre	12514.00
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	4241.00
	B) With using Batching Plant	metre	4156.00
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	6701.00
	B) With using Batching Plant	metre	6550.00
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	9795.00
	B) With using Batching Plant	metre	9578.00
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
12.38	Cement concrete for reinforced concrete in pile cap complete as per drawing and Technical Specification		

## Summary of Rate Analysis

<b>A</b>	<b>RCC Grade M20</b>		
(i)	Using Concrete Mixer	cum	4123.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4147.00
<b>B</b>	<b>RCC Grade M25</b>		
(i)	Using concrete mixer.	cum	4576.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4638.00
<b>C</b>	<b>RCC Grade M30</b>		
(i)	Using concrete mixer.	cum	4633.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4658.00
<b>D</b>	<b>RCC Grade M35</b>		
(i)	Using concrete mixer.	cum	4753.00
(ii)	Using Batching Plant, Transit Mixer and Concrete Pump	cum	4815.00
<b>12.39</b>	<b>Levelling course for Pile cap</b>	cum	3353.00
<b>12.40</b>	<b>Supplying, fitting and placing un-coated HYSD bar reinforcement in foundation complete as per drawing and technical specifications</b>	tonne	64230.00
<b>12.41</b>	<b>Supplying, fitting and placing un-coated Mild steel reinforcement complete in foundation as per drawing and technical specification</b>	tonne	66091.00

## Analysis of Rate

### CHAPTER-12 FOUNDATIONS

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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.					
		<b>I Ordinary soil</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		<b>A Manual Means</b>					
		<b>(i) Depth upto 3 m</b>					
		<b>a) Labour</b>					
		Mate	day	0.14	171.00	23.94	L-12
		Mazdoor	day	3.50	157.00	549.50	L-13
		<b>b) Overhead charges @ 0.25 on (a)</b>				143.36	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				71.68	
		Cost for 10 cum = a+b+c				788.48	
		<b>Rate per cum = (a+b+c)/10</b>				78.85	
					<i>say</i>	<b>79.00</b>	
		<b>Note</b>					
		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		<b>(ii) Depth 3 m to 6 m</b>					
		<b>a) Labour</b>					
		Mate/Supervisor	day	0.18	171.00	30.78	L-12
		Mazdoor	day	4.50	157.00	706.50	L-13
		<b>b) Overhead charges @ 0.25 on (a)</b>				184.32	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				92.16	
		Cost for 10 cum = a+b+c				1013.76	
		<b>Rate per cum = (a+b+c)/10</b>				101.38	
					<i>say</i>	<b>101.00</b>	
		<b>Note</b>					
		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		<b>(iii) Depth above 6 m</b>					
		<b>a) Labour</b>					
		Mate/Supervisor	day	0.24	171.00	41.04	L-12
		Mazdoor	day	6.00	157.00	942.00	L-13
		<b>b) Overhead charges @ 0.25 on (a)</b>				245.76	
		<b>c) Contractor's profit @ 0.1 on (a+b)</b>				122.88	
		Cost for 10 cum = a+b+c				1351.68	
		<b>Rate per cum = (a+b+c)/10</b>				135.17	
					<i>say</i>	<b>135.00</b>	
		<b>Note</b>					
		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>					
		<b>(i) Depth upto 3 m</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 240 cum</i>					
		<b>a) Labour</b>					
		Mate	day	0.32	171.00	54.72	L-12
		Mazdoor	day	8.00	157.00	1256.00	L-13
		<b>b) Machinery</b>					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1646.00	9876.00	P&M-026
		c) Overhead charges @ 0.25 on (a+b)				2796.68	
		d) Contractor's profit @ 0.1 on (a+b+c)				1398.34	
		Cost for 240 cum = a+b+c+d				15381.74	
		Rate per cum = (a+b+c+d)/240				64.09	
					<i>say</i>	<u>64.00</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..				
12.1 (I) B	(ii)	Depth 3 m to 6 m					
		<i>Unit = cum</i>					
		<i>Taking output = 210 cum</i>					
		a) Labour					
		Mate	day	0.32	171.00	54.72	L-12
		Mazdoor	day	8.00	157.00	1256.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1646.00	9876.00	P&M-026
		c) Overhead charges @ 0.25 on (a+b)				2796.68	
		d) Contractor's profit @ 0.1 on (a+b+c)				1398.34	
		Cost for 210 cum = a+b+c+d				15381.74	
		Rate per cum = (a+b+c+d)/210				73.25	
					<i>say</i>	<u>73.00</u>	
		Note	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) B	(iii)	Depth above 6m					
		<i>Unit = cum</i>					
		<i>Taking output = 180 cum</i>					
		a) Labour					
		Mate	day	0.40	171.00	68.40	L-12
		Mazdoor	day	10.00	157.00	1570.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1646.00	9876.00	P&M-026
		c) Overhead charges @ 0.25 on (a+b)				2878.60	
		d) Contractor's profit @ 0.1 on (a+b+c)				1439.30	
		Cost for 180 cum = a+b+c+d				15832.30	
		Rate per cum = (a+b+c+d)/180				87.96	
					<i>say</i>	<u>88.00</u>	
		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. Labour provided for excavation by mechanical means includes that required for trimming of bottom and side slopes.				
12.1	II	Ordinary Rock (not requiring blasting)					
	A	Manual Means					
	(i)	Depth upto 3 m					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		a) Labour					
		Mate	day	0.20	171.00	34.20	L-12
		Mazdoor	day	5.00	157.00	785.00	L-13
		b) Overhead charges @ 0.25 on (a)				204.80	
		c) Contractor's profit @ 0.1 on (a+b)				102.40	
		Cost for 10 cum = a+b+c				1126.40	
		Rate per cum = (a+b+c)/10				112.64	
					<i>say</i>	<u>113.00</u>	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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.					
12.1(II)		B	Mechanical Means					
			<i>Unit = cum</i>					
			<i>Taking output = 180 cum</i>					
		a)	Labour					
			Mate	day	0.24	171.00	41.04	L-12
			Mazdoor	day	6.00	157.00	942.00	L-13
		b)	Machinery					
			Hydraulic excavator 1.0 cum bucket capacity	hour	6.00	1646.00	9876.00	P&M-026
		c)	Overhead charges @ 0.25 on (a+b)				2714.76	
		d)	Contractor's profit @ 0.1 on (a+b+c)				1357.38	
			Cost for 180 cum = a+b+c+d				14931.18	
			Rate per cum = (a+b+c+d)/180				82.95	
						<i>say</i>	<i>83.00</i>	
		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		III	Hard Rock ( requiring blasting )					
		A	Manual Means					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
		a)	Labour					
			Mate	day	0.35	171.00	59.85	L-12
			Driller	day	0.50	190.00	95.00	L-06
			Blaster	day	0.25	264.00	66.00	L-03
			Mazdoor	day	8.00	157.00	1256.00	L-13
		b)	Machinery					
			Air Compressor 250 cfm with 2 jack hammer for drilling.	hour	1.00	405.00	405.00	P&M-001
		c)	Material					
			Blasting Material	kg	3.50	643.63	2252.69	M-104
			Detonator electric	each	14.00	6.00	84.00	M-094/100
		d)	Overhead charges @ 0.25 on (a+b+c)				1054.63	
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				527.32	
			Cost for 10 cum = a+b+c+d+e				5800.49	
			Rate per cum = (a+b+c+d+e)/10				580.05	
						<i>say</i>	<i>580.00</i>	
		Note	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		IV	Hard Rock ( blasting prohibited )					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
		A	Mechanical Means					
		a)	Labour					
			Mate	day	0.20	171.00	34.20	L-12
			Mazdoor	day	5.00	157.00	785.00	L-13
		b)	Machinery					
			Air Compressor 250 cfm with 2 leads of pneumatic breaker	hour	6.00	405.00	2430.00	P&M-001
		c)	Overhead charges @ 0.25 on (a+b)				812.30	
		d)	Contractor's profit @ 0.1 on (a+b+c)				406.15	



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 10 cum = a+b+c+d				4467.65	
		Rate per cum = (a+b+c+d)/10				446.77	
					<i>say</i>	<u>447.00</u>	
		<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	V	<b>Marshy Soil</b>					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		Depth upto 3 m					
	A	<b>Manual means</b>					
		a) Labour					
		Mate/Supervisor	day	0.40	171.00	68.40	L-12
		Mazdoor	day	10.00	157.00	1570.00	L-13
		b) Machinery					
		Tractor-trolley for removal.	hour	2.67	459.00	1225.53	P&M-053
		c) Overhead charges @ 0.25 on (a+b)				715.98	
		d) Contractor's profit @ 0.1 on (a+b+c)				357.99	
		Cost for 10 cum = a+b+c+d				3937.90	
		Rate per cum = (a+b+c+d)/ 10				393.79	
					<i>say</i>	<u>394.00</u>	
		<b>Note</b>					
		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	171.00	13.68	L-12
		Mazdoor for dressing sides, bottom and backfilling	day	2.00	157.00	314.00	L-13
		b) Machinery					
		Hydraulic excavator 1.0 cum bucket capacity @ 60 cum per hour	hour	0.17	1646.00	279.82	P&M-026
		Tipper 5.5 cum capacity, 4 trips per hour.	hour	0.45	787.00	354.15	P&M-048
		c) Overhead charges @ 0.25 on (a+b)				240.41	
		d) Contractor's profit @ 0.1 on (a+b+c)				120.21	
		Cost for 10 cum = a+b+c+d				1322.27	
		Rate per cum = (a+b+c+d)/10				132.23	
					<i>say</i>	<u>132.00</u>	
		<b>Note</b>					
		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>					
		<i>Unit : Cum</i>					
		<i>Taking Output : 6 cum</i>					
		a) Labour					
		Mate	day	0.12	171.00	20.52	L-12

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor for dressing sides, bottom and backfilling	day	3.00	157.00	471.00	L-13
		b) Machinery					
		Tractor-trolley for transportation	hour	2.00	459.00	918.00	P&M-053
		c) Overhead charges @ 0.25 on (a+b)				352.38	
		d) Contractor's profit @ 0.1 on (a+b+c)				176.19	
		Cost for 6 cum = a+b+c+d				1938.09	
		Rate per cum = (a+b+c+d)/6				323.02	
					<i>say</i>	<b>323.00</b>	
12.2	304	Filling Annular Space Around Footing in Rock					
		<i>Unit = cum</i>					
		<i>Taking out put = 1 cum</i>					
		Lean cement concrete 1:3:6 nominal mix. Rate may be taken as per item 12.4.				<b>VALUE</b>	
12.3	304	Sand Filling in Foundation Trenches as per Drawing & Technical Specification					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Labour					
		Mate	day	0.01	171.00	1.71	L-12
		Mazdoor	day	0.30	157.00	47.10	L-13
		b) Material					
		Sand (assuming 20 per cent voids)	cum	1.20	113.71	136.45	M-006
		c) Overhead charges @ 0.25 on (a+b)				46.32	
		d) Contractor's profit @ 0.1 on (a+b+c)				23.16	
		Rate per cum = a+b+c+d				254.74	
					<i>say</i>	<b>255.00</b>	
12.4	2100	PCC 1:3:6 in Foundation					
		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.					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Labour					
		Mate	day	0.64	171.00	109.44	L-12
		Mason	day	1.00	213.00	213.00	L-11
		Mazdoor	day	15.00	157.00	2355.00	L-13
		b) Material					
		40 mm Aggregate	cum	13.50	425.02	5737.77	M-055
		coarse Sand	cum	6.75	133.28	899.64	M-005
		cement	tonne	3.45	5462.00	18843.90	M-081
		Cost of water	KL	18.00	225.00	4050.00	M-189
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		Water tanker 6 KL capacity	hour	2.00	154.00	308.00	P&M-060
		d) Overhead charges @ 0.25 on (a+b+c)				8921.19	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				4460.59	
		Cost for 15 cum = a+b+c+d+e				49066.53	
		Rate per cum = (a+b+c+d+e)/15				3271.10	
					<i>say</i>	<b>3271.00</b>	
		<b>Note</b> Vibrator is a part of minor T & P which is already included in overhead charges of the contractor.					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.5	1300	Brick Masonry Work in Cement Mortar 1:3 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.					
		<i>Unit = cum</i>					
		<i>Taking output = 5 cum</i>					
		a) Material					
		Bricks 1st class	each	2500.00	5.636	14090.00	M-079
		Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	1.20	3074.00	3688.80	Item 12.6 (A)
		b) Labour					
		Mate	day	0.48	171.00	82.08	L-12
		Mason	day	4.00	213.00	852.00	L-11
		Mazdoor	day	8.00	157.00	1256.00	L-13
		c) Overhead charges @ 0.25 on (a+b)				4992.22	
		d) Contractor's profit @ 0.1 on (a+b+c)				2496.11	
		Cost for 5 cum = a+b+c+d				27457.21	
		Rate per cum (a+b+c+d)/5				5491.44	
					<i>say</i>	<b>5491.00</b>	
		(i) Rate for Brick Work in C. M. 1:2 in foundation				<b>5778.00</b>	
		(ii) Rate for Brick Work in C. M. 1:3 in foundation				<b>5491.00</b>	
		(iii) Rate for Brick Work in C. M. 1:4 in foundation				<b>5296.00</b>	
		(iv) Rate for Brick Work in C. M. 1:6 in foundation				<b>5104.00</b>	
12.6	Sub-analysis	(A) Cement Mortar 1:3 (1 cement : 3 sand)					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Materials					
		Cement	tonne	0.51	5462.00	2785.62	M-081
		Sand	cum	1.05	133.28	139.94	M-005
		b) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mazdoor	day	0.90	157.00	141.30	L-13
		Total Material and Labour = (a+b)				<i>say</i>	<b>3074.00</b>
	Sub-analysis (Addl.)	(B) Cement Mortar 1:2 (1 cement : 2 sand)					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Materials					
		Cement	tonne	0.672	5462.00	3670.46	M-081
		Sand	cum	0.933	133.28	124.39	M-005
		b) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mazdoor	day	0.90	157.00	141.30	L-13
		Total Material and Labour = (a+b)				<i>say</i>	<b>3943.00</b>
	Sub-analysis (Addl.)	(C) Cement Mortar 1:4 (1 cement : 4 sand)					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Materials					
		Cement	tonne	0.40	5462.00	2184.80	M-081
		Sand	cum	1.12	133.28	149.27	M-005
		b) Labour					
		Mate	day	0.04	171.00	6.84	L-12

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor	day	0.90	157.00	141.30	L-13
		Total Material and Labour = (a+b)			say	2482.00	
	Sub-analysis (Addl.)	(D) Cement Mortar 1:6 (1cement :6 sand)					
		Unit = 1 cum					
		Taking output = 1 cum					
		a) Materials					
		Cement	tonne	0.288	5462.00	1573.06	M-081
		Sand	cum	1.337	133.28	178.21	M-005
		b) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mazdoor	day	0.90	157.00	141.30	L-13
		Total Material and Labour = (a+b)			say	1899.00	
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	294.26	1618.43	M-169
		Through and bond stone	each	35.00	11.25	393.75	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	3074.00	4611.00	Item 12.6 (A)
		b) Labour					
		Mate	day	0.66	171.00	112.86	L-12
		Mason	day	7.50	213.00	1597.50	L-11
		Mazdoor	day	9.00	157.00	1413.00	L-13
		c) Overhead charges @ 0.25 on (a+b)				2436.64	
		d) Contractor's profit @ 0.1 on (a+b+c)				1218.32	
		Cost for 5 cum = a+b+c+d				13401.49	
		Rate per cum (a+b+c+d)/5				2680.30	
					say	2680.00	
	1405.3	(B) Random Rubble Masonry (coursed/uncoursed)					
		Unit = cum					
		Taking output = 5 cum					
		a) Material					
		Stone	cum	5.50	294.26	1618.43	M-148
		Through and bond stone	each	35.00	11.25	393.75	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	1.55	3074.00	4764.70	Item 12.6 (A)
		b) Labour					
		Mate	day	0.62	171.00	106.02	L-12
		Mason	day	6.00	213.00	1278.00	L-11
		Mazdoor	day	9.00	157.00	1413.00	L-13
		c) Overhead charges @ 0.25 on (a+b)				2393.48	
		d) Contractor's profit @ 0.1 on (a+b+c)				1196.74	
		Cost for 5 cum = a+b+c+d				13164.11	
		Rate per cum (a+b+c+d)/5				2632.82	
					say	2633.00	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		Note	The labour already considered in cement mortar has been taken into account while proposing labour for masonry works.						
12.8	1500, 1700 & 2100		Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications.						
		A	PCC Grade M15						
			<i>Unit = cum</i>						
			<i>Taking output = 15 cum</i>						
		a)	Material						
			Cement	tonne	4.13	5462.00	22558.06	M-081	
			Coarse sand	cum	6.75	133.28	899.64	M-005	
			40 mm Aggregate	cum	8.10	425.02	3442.66	M-055	
			20 mm Aggregate	cum	4.05	529.62	2144.96	M-053	
			10 mm Aggregate	cum	1.35	589.97	796.46	M-051	
		b)	Labour						
			Mate	day	0.86	171.00	147.06	L-12	
			Mason	day	1.50	213.00	319.50	L-11	
			Mazdoor	day	20.00	157.00	3140.00	L-13	
		c)	Machinery						
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009	
			Generator 63 KVA	hour	6.00	893.00	5358.00	P&M-019	
			<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>2611.00</b>				
		d)	Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery						1566.17
		e)	Overhead charges @ 0.25 on (a+b+c+d)						10180.13
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)						5090.06
			Cost for 15 cum = a+b+c+d+e+f						55990.71
			Rate per cum = (a+b+c+d+e+f)/15						3732.71
									<b>say 3733.00</b>
		Note	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	PCC Grade M20						
			<i>Unit : cum</i>						
			<i>Taking output = 15 cum</i>						
		a)	Material						
			Cement	tonne	5.16	5462.00	28183.92	M-081	
			Coarse sand	cum	6.75	133.28	899.64	M-005	
			40 mm Aggregate	cum	5.40	425.02	2295.11	M-055	
			20 mm Aggregate	cum	5.40	529.62	2859.95	M-053	
			10 mm Aggregate	cum	2.70	589.97	1592.92	M-051	
		b)	Labour						
			Mate	day	0.86	171.00	147.06	L-12	
			Mason	day	1.50	213.00	319.50	L-11	
			Mazdoor	day	20.00	157.00	3140.00	L-13	
		c)	Machinery						
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009	
			Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079	
			<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>2841.00</b>				
		d)	Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery						1704.24
		e)	Overhead charges @ 0.25 on (a+b+c+d)						11077.58
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)						5538.79

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 15 cum = a+b+c+d+e+f				60926.72	
		Rate per cum = (a+b+c+d+e+f)/15				4061.78	
					<i>say</i>	<b>4062.00</b>	
12.8	C	RCC Grade M20					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	5.21	5462.00	28457.02	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>			<b>2908.00</b>		
		d) Formwork @ 4 per cent on (a+b+c)				1744.28	
		e) Overhead charges @ 0.25 on (a+b+c+d)				11337.81	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				5668.91	
		Cost for 15 cum = a+b+c+d+e+f				62357.98	
		Rate per cum = (a+b+c+d+e+f)/15				4157.20	
					<i>say</i>	<b>4157.00</b>	
12.8 C	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit : cum</i>					
		<i>Taking Output = 120 cum</i>					
		a) Material					
		Cement	tonne	41.66	5462.00	227546.92	M-081
		Coarse Sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 km, L-lead in km	tonne.km	300L	6.00	1800.00	P&M-050
		Concrete Pump	hour	6	323.00	1938.00	P&M-007
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>			<b>2910.00</b>		
		d) Formwork @ 4 per cent on cost of concrete i.e. cost of material, labour and machinery				13964.19	
		e) Overhead charges @ 0.25 on (a+b+c+d)				90767.24	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				45383.62	
		Cost for 120 cum = a+b+c+d+e+f				499219.81	
		Rate per cum = (a+b+c+d+e+f)/120				4160.17	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					<i>say</i>	<u>4160.00</u>	
12.8	D	PCC Grade M25					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	5.99	5462.00	32717.38	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		40 mm Aggregate	cum	5.40	425.02	2295.11	M-055
		20 mm Aggregate	cum	5.40	529.62	2859.95	M-053
		10 mm Aggregate	cum	2.70	589.97	1592.92	M-051
		b) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3143.00</b>			
		d) Formwork @ 3.75 per cent of (a+b+c)				1767.73	
		e) Overhead charges @ 0.25 on (a+b+c+d)				12226.82	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6113.41	
		Cost for 15 cum = a+b+c+d+e+f				67247.52	
		Rate per cum = (a+b+c+d+e+f)/15				4483.17	
					<i>say</i>	<u>4483.00</u>	
12.8 D	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit : cum</i>					
		<i>Taking Output = 120 cum</i>					
		a) Material					
		Cement	tonne	47.95	5462.00	261902.90	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		40 mm Aggregate	cum	43.20	425.02	18360.86	M-055
		20 mm Aggregate	cum	43.20	529.62	22879.58	M-053
		10 mm Aggregate	cum	21.60	589.97	12743.35	M-051
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6	323.00	1938.00	P&M-007
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3147.00</b>			
		d) Formwork @ 3.75 per cent of cost of concrete i.e. cost of material, labour and machinery				14161.44	
		e) Overhead charges @ 0.25 on (a+b+c+d)				97949.98	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				48974.99	
		cost of 120 cum = a+b+c+d+e+f				538724.87	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per cum = (a+b+c+d+e+f)/120				4489.37	
					<i>say</i>	<b>4489.00</b>	
12.8	E	RCC Grade M25					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	6.05	5462.00	33045.10	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3214.00</b>			
		d) Formwork @ 3.75 per cent of a+b+c.				1807.31	
		e) Overhead charges @ 0.25 on (a+b+c+d)				12500.59	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6250.30	
		cost of 15 cum = a+b+c+d+e+f				68753.27	
		Rate per cum (a+b+c+d+e+f)/15				4583.55	
					<i>say</i>	<b>4584.00</b>	
12.8 E	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit: cum</i>					
		<i>Taking Output = 120 cum</i>					
		a) Material					
		Cement	tonne	48.38	5462.00	264251.56	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity 1 cum	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3216.00</b>			
		d) Formwork @ 3.75 per cent on cost of concrete i.e. cost of material, labour and machinery				14467.85	
		e) Overhead charges @ 0.25 on (a+b+c+d)				100069.31	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				50034.66	
		cost of 120 cum = a+b+c+d+e+f				550381.22	
		Rate per cum (a+b+c+d+e+f)/120				4586.51	



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					<i>say</i>	<u>4587.00</u>	
12.8	F	PCC Grade M30					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	6.08	5462.00	33208.96	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		40 mm Aggregate	cum	5.40	425.02	2295.11	M-055
		20 mm Aggregate	cum	5.40	529.62	2859.95	M-053
		10 mm Aggregate	cum	2.70	589.97	1592.92	M-051
		b) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3176.00</b>			
		d) Formwork @ 3.50 per cent of cost of concrete i.e. cost of material, labour and machinery				1667.09	
		e) Overhead charges @ 0.25 on (a+b+c+d)				12324.56	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6162.28	
		cost of 15 cum = a+b+c+d+e+f				67785.06	
		Rate per cum (a+b+c+d+e+f)/15				4519.00	
					<i>say</i>	<u>4519.00</u>	
12.8 F	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit : cum</i>					
		<i>Taking Output = 120 cum</i>					
		a) Material					
		Cement	tonne	48.60	5462.00	265453.20	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		40 mm Aggregate	cum	43.20	425.02	18360.86	M-055
		20 mm Aggregate	cum	43.20	529.62	22879.58	M-053
		10 mm Aggregate	cum	21.60	589.97	12743.35	M-051
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3177.00</b>			
		d) Formwork @ 3.50 per cent of cost of concrete i.e. cost of material, labour and machinery				13341.61	
		e) Overhead charges @ 0.25 on (a+b+c+d)				98632.59	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				49316.30	
		cost of 120 cum = a+b+c+d+e+f				542479.25	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per cum (a+b+c+d+e+f)/120				4520.66	
					<i>say</i>	<b>4521.00</b>	
12.8	G	RCC Grade M30					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	6.10	5462.00	33318.20	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3232.00</b>			
		d) Formwork @ 3.5 per cent on cost of concrete i.e. cost of material, labour and machinery				1696.39	
		e) Overhead charges @ 0.25 on (a+b+c+d)				12541.14	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6270.57	
		cost of 15 cum = a+b+c+d+e+f				68976.25	
		Rate per cum = (a+b+c+d+e+f)/15				4598.42	
					<i>say</i>	<b>4598.00</b>	
12.8 G	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	48.80	5462.00	266545.60	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3235.00</b>			
		d) Formwork @ 3.5 per cent of cost of concrete i.e. cost of material, labour and machinery				13583.62	
		e) Overhead charges @ 0.25 on (a+b+c+d)				100421.77	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				50210.88	
		cost of 120 cum = a+b+c+d+e+f				552319.71	
		Rate per cum (a+b+c+d+e+f)/120				4602.66	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					<i>say</i>	<u>4603.00</u>	
12.8	H	RCC Grade M35					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	6.33	5462.00	34574.46	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3315.00</b>			
		d) Formwork @ 3 per cent on a+b+c				1491.73	
		e) Overhead charges @ 0.25 on (a+b+c+d)				12804.04	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6402.02	
		cost of 15 cum = a+b+c+d+e+f				70422.21	
		Rate per cum = (a+b+c+d+e+f)/15				4694.81	
					<i>say</i>	<u>4695.00</u>	
12.8 H	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit ; cum</i>					
		<i>Taking Output = 120 cum</i>					
		a) Material					
		Cement	tonne	50.64	5462.00	276595.68	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Transit Mixer 4 cum capacity lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3318.00</b>			
		d) Formwork @ 3 per cent on cost of concrete i.e. cost of material, labour and machinery				11944.61	
		e) Overhead charges @ 0.25 on (a+b+c+d)				102524.53	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				51262.27	
		cost of 120 cum = a+b+c+d+e+f				563884.92	
		Rate per cum = (a+b+c+d+e+f)/120				4699.04	
					<i>say</i>	<u>4699.00</u>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<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.					
		<b>WELL FOUNDATION</b>					
12.9	1200	Providing and Constructing Temporary Island 16 m diameter for Construction of Well Foundation for 8m dia. Well.					
	<b>A</b>	Assuming depth of water 1.0 m and height of island to be 1.25 m <b>including Royalty for earth @ Rs. 5526.40 for each Island.</b>					
		<i>Unit = 1 No</i>					
		<i>Taking output = 1 No.</i>					
		<b>a) Material</b>					
		Earth (compacted)	cum	251.20	23.65	5940.88	M-092
		Sand bags	each	750.00	6.73	5047.50	M-159
		<b>b) Labour</b>					
		Mate	day	0.40	171.00	68.40	L-12
		Mazdoor for filling sand bags, stitching and placing	day	15.00	157.00	2355.00	L-13
		<b>c) Machinery</b>					
		Crane with grab 1 cum capacity	hour	20.00	1079.00	21580.00	P&M-012
		Consumables @ 2.5 per cent of (c) above				539.50	
		<b>d) Overhead charges @ 0.25 on (a+b+c)</b>				8882.82	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				4441.41	
		<b>Rate per No. (a+b+c+d+e)</b>				48855.51	
					<b>say</b>	<b>48856.00</b>	
		<b>Note</b> It is assumed that earth will be available within the working space of crane with grab bucket.					
12.9	<b>B</b>	Assuming depth of water 4.0 m and height of island 4.5 m <b>including Royalty for earth @ Rs. 19895.04 for each Island.</b>					
		<i>Unit = 1No</i>					
		<i>Taking output = 1 No</i>					
		<b>a) Material</b>					
		Earth (compacted)	cum	904.32	23.65	21387.17	M-092
		Sand bags	each	6000.00	6.73	40380.00	M-159
		Wooden ballies 8" Dia and 9 m long	each	95.00	580.50	55147.50	M-194
		Wooden ballies 2" Dia for bracing	metre	190.00	24.00	4560.00	M-193
		<b>b) Labour</b>					
		Mate	day	5.60	171.00	957.60	L-12
		Mazdoor for piling 8" dia ballies for piling 8" dia ballies	day	18.00	157.00	2826.00	L-13
		Mazdoor for bracing with 2" dia ballies	day	12.00	157.00	1884.00	L-13
		Mazdoor for filling sand bags, stitching and placing	day	110.00	157.00	17270.00	L-13
		<b>c) Machinery</b>					
		Crane with grab 1 cum capacity	hour	50.00	1079.00	53950.00	P&M-012
		Consumables and other arrangements for piling ballies @ 2.5 per cent of (a+b+c).				4959.06	
		<b>d) Overhead charges @ 0.25 on (a+b+c)</b>				50830.33	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				25415.17	
		<b>Rate per No. (a+b+c+d+e)</b>				279566.82	
					<b>say</b>	<b>279567.00</b>	
		<b>Note</b> 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.					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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 @ Rs. 330.00 per m for service Road.					
		Assuming span length 30 m, width of service road 10m and depth of water 1m					
		<i>Unit = 1 meter</i>					
		<i>Taking output = 30 metre</i>					
		a) Material					
		Earth	cum	450.00	23.65	10642.50	M-092
		Sand bags	each	300.00	6.73	2019.00	M-159
		b) Labour					
		Mate	day	0.24	171.00	41.04	L-12
		Mazdoor for filling sand bags, stitching and placing	day	6.00	157.00	942.00	L-13
		c) Machinery					
		Front end Loader 1 cum capacity	hour	27.00	1071.00	28917.00	P&M-017
		Tipper 5.5 cum capacity	hour	28.00	787.00	22036.00	P&M-048
		d) Overhead charges @ 0.25 on (a+b+c)				16149.39	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				8074.69	
		Cost for 30 m (a+b+c+d+e)				88821.62	
		Rate per m (a+b+c+d+e)/30				2960.72	
						<i>say</i>	<i>2961.00</i>
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.					
		<i>Unit = 1 MT</i>					
		<i>Taking output = 1 MT</i>					
		a) Material					
		Structural steel in plates, angles, etc including 5 per cent wastage	tonne	1.05	44879.36	47123.33	M-179
		Nuts & bolts	Kg	20.00	58.03	1160.60	M-130
		b) Labour					
		(for cutting, bending, making holes, joining, welding and erecting in position)					
		Mate	day	1.32	171.00	225.72	L-12
		Fitter	day	5.50	216.00	1188.00	L-08
		Blacksmith	day	5.50	213.00	1171.50	L-02a
		Welder	day	5.50	239.00	1314.50	L-02b
		Mazdoor	day	16.50	157.00	2590.50	L-13
		Electrodes, cutting gas and other consumables @ 10 per cent of cost of (a) above				4828.39	
		c) Overhead charges @ 0.25 on (a+b)				14900.64	
		d) Contractor's profit @ 0.1 on (a+b+c)				7450.32	
		Rate per MT (a+b+c+d)				81953.49	
						<i>say</i>	<i>81953.00</i>
12.11	1200, 1500 & 1700	Plain/Reinforced Cement Concrete, in Well Foundation complete as per Drawing and Technical Specification.					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		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)				2908.00	Item 12.8 (C)

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) formwork @ 20 per cent of the cost of concrete				581.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				872.40	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				436.20	
		Rate perm (a+b+c+d+e+f)				4798.20	
					<i>say</i>	<u>4798.00</u>	
12.11 A (i)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				2910.00	Item 12.8 (C)
		d) formwork @ 20 per cent of the cost of concrete				582.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				873.00	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				436.50	
		Rate perm (a+b+c+d+e+f)				4801.50	
					<i>say</i>	<u>4802.00</u>	
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)				3214.00	Item 12.8 (E)
		d) formwork @ 20 per cent of the cost of concrete				642.80	
		e) Overhead charges @ 0.25 on (a+b+c+d)				964.20	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				482.10	
		Rate perm (a+b+c+d+e+f)				5303.10	
					<i>say</i>	<u>5303.00</u>	
12.11 A (ii)	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3457.00	Item 12.8 (E)
		d) formwork @ 20 per cent of the cost of concrete				691.40	DIR used item
		e) Overhead charges @ 0.25 on (a+b+c+d)				1037.10	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				518.55	
		Rate perm (a+b+c+d+e+f)				5704.05	
					<i>say</i>	<u>5704.00</u>	
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)				3315.00	Item 12.8 (H) Case I
		d) formwork @ 20 per cent of the cost of concrete				663.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				994.50	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				497.25	
		Rate perm (a+b+c+d+e+f)				5469.75	
					<i>say</i>	<u>5470.00</u>	
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)				3572.00	Item 12.8 (H)
		d) formwork @ 20 per cent of the cost of concrete				714.40	DIR used item
		e) Overhead charges @ 0.25 on (a+b+c+d)				1071.60	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				535.80	
		Rate perm (a+b+c+d+e+f)				5893.80	
					<i>say</i>	<u>5894.00</u>	
	Note.	If curb concrete is carried out within steel liner, cost of formwork shall be excluded.					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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)				2611.00	Item 12.8 (A)
		d) formwork @ 10 per cent of the cost of concrete				261.10	
		e) Overhead charges @ 0.25 on (a+b+c+d)				718.03	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				359.01	
		Rate perm (a+b+c+d+e+f)				3949.14	
					<i>say</i>	<b>3949.00</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)				2841.00	Item 12.8 (B) PCC
		d) formwork @ 10 per cent of the cost of concrete				284.10	
		e) Overhead charges @ 0.25 on (a+b+c+d)				781.28	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				390.64	
		Rate perm (a+b+c+d+e+f)				4297.01	
						<i>say</i>	<b>4297.00</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)				2908.00	Item 12.8 (C)
		d) formwork @ 10 per cent of the cost of concrete				290.80	
		e) Overhead charges @ 0.25 on (a+b+c+d)				799.70	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				399.85	
		Rate perm (a+b+c+d+e+f)				4398.35	
						<i>say</i>	<b>4398.00</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)				2910.00	Item 12.8 (C)
		d) formwork @ 10 per cent of the cost of concrete				291.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				800.25	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				400.13	
		Rate perm (a+b+c+d+e+f)				4401.38	
						<i>say</i>	<b>4401.00</b>
12.11 B	(iv)	PCC M25 Grade					
		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)				3143.00	Item 12.8 (D)
		d) formwork @ 10 per cent of the cost of concrete				314.30	
		e) Overhead charges @ 0.25 on (a+b+c+d)				864.33	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				432.16	
		Rate perm (a+b+c+d+e+f)				4753.79	
						<i>say</i>	<b>4754.00</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)				3147.00	Item 12.8 (D)

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) formwork @ 10 per cent of the cost of concrete				314.70	
		e) Overhead charges @ 0.25 on (a+b+c+d)				865.43	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				432.71	
		Rate perm (a+b+c+d+e+f)				4759.84	
					<i>say</i>	<u>4760.00</u>	
'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)				3214.00	Item 12.8 (E)
		d) formwork @ 10 per cent of the cost of concrete				321.40	
		e) Overhead charges @ 0.25 on (a+b+c+d)				883.85	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				441.93	
		Rate perm (a+b+c+d+e+f)				4861.18	
					<i>say</i>	<u>4861.00</u>	
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)				3457.00	Item 12.8 (E)
		d) formwork @ 10 per cent of the cost of concrete				345.70	DIR used item
		e) Overhead charges @ 0.25 on (a+b+c+d)				950.68	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				475.34	
		Rate perm (a+b+c+d+e+f)				5228.71	
					<i>say</i>	<u>5229.00</u>	
'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)				3176.00	Item 12.8 (F)
		d) formwork @ 10 per cent of the cost of concrete				317.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				873.40	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				436.70	
		Rate perm (a+b+c+d+e+f)				4803.70	
					<i>say</i>	<u>4804.00</u>	
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)				3177.00	Item 12.8 (F)
		d) formwork @ 10 per cent of the cost of concrete				317.70	
		e) Overhead charges @ 0.25 on (a+b+c+d)				873.68	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				436.84	
		Rate perm (a+b+c+d+e+f)				4805.21	
					<i>say</i>	<u>4805.00</u>	
'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)				3232.00	Item 12.8 (G)
		d) formwork @ 10 per cent of the cost of concrete				323.20	
		e) Overhead charges @ 0.25 on (a+b+c+d)				888.80	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				444.40	
		Rate perm (a+b+c+d+e+f)				4888.40	
					<i>say</i>	<u>4888.00</u>	



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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)				3235.00	Item 12.8 (G)
		d) formwork @ 10 per cent of the cost of concrete				323.50	
		e) Overhead charges @ 0.25 on (a+b+c+d)				889.63	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				444.81	
		Rate perm (a+b+c+d+e+f)				4892.94	
					<i>say</i>	<b>4893.00</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)				3315.00	Item 12.8 (H) Case I
		d) formwork @ 10 per cent of the cost of concrete				331.50	
		e) Overhead charges @ 0.25 on (a+b+c+d)				911.63	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				455.81	
		Rate perm (a+b+c+d+e+f)				5013.94	
					<i>say</i>	<b>5014.00</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)				3572.00	Item 12.8 (H)
		d) formwork @ 10 per cent of the cost of concrete				357.20	DIR used item
		e) Overhead charges @ 0.25 on (a+b+c+d)				982.30	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				491.15	
		Rate perm (a+b+c+d+e+f)				5402.65	
					<i>say</i>	<b>5403.00</b>	
'12.11 B	(ix)	RCC M40 Grade					
		Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	51.60	5462.00	281839.20	M-081
		Coarse Sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		Admixture	kg	206.00	150.00	30900.00	M-180
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Transit Mixer 4 cum capacity for lead beyond 1 km.	tonne.km	300xL	6.00	1800.00	Lead= 1 , P&M-050
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>					
					<b>3620.00</b>		
		d) Formwork @ 10 per cent on cost of concrete i.e. cost of material, labour and machinery				43429.70	
		e) Overhead charges @ 0.25 on (a+b+c+d)				119431.69	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				59715.84	
		cost of 120 cum = a+b+c+d+e+f				656874.27	
		Rate per cum = (a+b+c+d+e+f)/120				5473.95	
					<i>say</i>	<u>5474.00</u>	
12.11 C	C	<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)	PCC Grade M20					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	5.55	5462.00	30314.10	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		40 mm Aggregate	cum	5.40	425.02	2295.11	M-055
		20 mm Aggregate	cum	5.40	529.62	2859.95	M-053
		10 mm Aggregate	cum	2.70	589.97	1592.92	M-051
		Admixture	Kg	18.60	150.00	2790.00	M-180
		b) Labour					
		Mate	day	0.90	171.00	153.90	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		Light Crane 3 tonnes capacity for handling tremie pipe	hour	6.00	452.00	2712.00	P&M-013
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3350.00</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.				2218.26	
		d) Overhead charges @ 0.25 on (a+b+c)				13115.84	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6557.92	
		cost of 15 cum = a+b+c+d+e				72137.13	
		Rate per cum = (a+b+c+d+e)/15				4809.14	
					<i>say</i>	<u>4809.00</u>	
12.11 C (i)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		<i>Unit ; cum</i>					
		<i>Taking Output = 120 cum</i>					
		a) Material					
		Cement	tonne	44.40	5462.00	242512.80	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		Admixture	Kg	148.80	150.00	22320.00	M-180
		b) Labour					
		Mate	day	0.88	171.00	150.48	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1071.00	6426.00	P&M-017

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3220.00</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.				16772.57	
		d) Overhead charges @ 0.25 on (a+b+c)				100792.51	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				50396.26	
		cost of 120 cum = a+b+c+d+e				554358.82	
		Rate per cum = (a+b+c+d+e)/120				4619.66	
					<b>say</b>	<b>4620.00</b>	
'12.11 C	(ii)	PCC Grade M25					
	Case I	Using Concrete Mixer					
		<b>Unit = cum</b>					
		<b>Taking output = 15 cum</b>					
		a) Material					
		Cement	tonne	5.99	5462.00	32717.38	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		40 mm Aggregate	cum	5.40	425.02	2295.11	M-055
		20 mm Aggregate	cum	5.40	529.62	2859.95	M-053
		10 mm Aggregate	cum	2.70	589.97	1592.92	M-051
		Admixture	Kg	21.60	150.00	3240.00	M-180
		b) Labour					
		Mate	day	0.90	171.00	153.90	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	452.00	2712.00	P&M-013
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3540.00</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.				2360.92	
		d) Overhead charges @ 0.25 on (a+b+c)				13864.83	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6932.41	
		cost of 15 cum = a+b+c+d+e				76256.56	
		Rate per cum = (a+b+c+d+e)/15				5083.77	
					<b>say</b>	<b>5084.00</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>					
		a) Material					
		Cement	tonne	47.88	5462.00	261520.56	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		Admixture	Kg	172.80	150.00	25920.00	M-180
		b) Labour					
		Mate	day	0.88	171.00	150.48	L-12

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3409.00</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.				17902.96	
		d) Overhead charges @ 0.25 on (a+b+c)				106727.05	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				53363.53	
		cost of 120 cum = a+b+c+d+e				586998.78	
		Rate per cum = (a+b+c+d+e)/120				4891.66	
					<b>say</b>	<b>4892.00</b>	
'12.11 C	(iii)	PCC Grade M30					
	Case I	Using Concrete Mixer					
		<b>Unit = 1 cum</b>					
		<b>Taking output = 15 cum</b>					
		a) Material					
		Cement	tonne	6.08	5462.00	33208.96	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		40 mm Aggregate	cum	5.40	425.02	2295.11	M-055
		20 mm Aggregate	cum	5.40	529.62	2859.95	M-053
		10 mm Aggregate	cum	2.70	589.97	1592.92	M-051
		Admixture	Kg	21.60	150.00	3240.00	M-180
		b) Labour					
		Mate	day	0.90	171.00	153.90	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	452.00	2712.00	P&M-013
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3573.00</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.				2385.50	
		d) Overhead charges @ 0.25 on (a+b+c)				13993.87	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6996.93	
		cost of 15 cum = a+b+c+d+e				76966.28	
		Rate per cum = (a+b+c+d+e)/15				5131.09	
					<b>say</b>	<b>5131.00</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>					
		a) Material					
		Cement	tonne	48.64	5462.00	265671.68	M-081

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		Admixture	Kg	172.80	150.00	25920.00	M-180
		<b>b) Labour</b>					
		Mate	day	0.88	171.00	150.48	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3443.00</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.				18110.52	
		<b>d) Overhead charges @ 0.25 on (a+b+c)</b>				107816.72	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				53908.36	
		cost of 120 cum = a+b+c+d+e				592991.96	
		<b>Rate per cum = (a+b+c+d+e)/120</b>				4941.60	
					<b>say</b>	<b>4942.00</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	5462.00	34355.98	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		40 mm Aggregate	cum	5.40	425.02	2295.11	M-055
		20 mm Aggregate	cum	5.40	529.62	2859.95	M-053
		10 mm Aggregate	cum	2.70	589.97	1592.92	M-051
		Admixture	Kg	21.60	150.00	3240.00	M-180
		<b>b) Labour</b>					
		Mate	day	0.90	171.00	153.90	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		Light Crane of 3 tonnes capacity for handling tremie pipe	hour	6.00	452.00	2712.00	P&M-013
		<b>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</b>		<b>3650.00</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.				2442.85	
		<b>d) Overhead charges @ 0.25 on (a+b+c)</b>				14294.96	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				7147.48	
		cost of 15 cum = a+b+c+d+e				78622.29	
		<b>Rate per cum = (a+b+c+d+e)/15</b>				5241.49	
					<b>say</b>	<b>5241.00</b>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.11 C (iv)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	50.28	5462.00	274629.36	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		Admixture	Kg	172.80	150.00	25920.00	M-180
		b) Labour					
		Mate	day	0.88	171.00	150.48	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Transit Mixer 4 cum capacity, lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<i>Per Cum Basic Cost of Labour, Material &amp; Machinery (a+b+c)</i>		<b>3518.00</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.				18558.40	
		d) Overhead charges @ 0.25 on (a+b+c)				110168.11	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				55084.06	
		cost of 120 cum = a+b+c+d+e				605924.61	
		Rate per cum = (a+b+c+d+e)/120				5049.37	
					<b>say</b>	<b>5049.00</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)				3350.00	Item 12.11 (C) i
		d) Overhead charges @ 0.25 on (a+b+c)				837.50	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				418.75	
		Rate per cum = (a+b+c+d+e)				4606.25	
					<b>say</b>	<b>4606.00</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)				3220.00	Item 12.11 (C) i
		d) Overhead charges @ 0.25 on (a+b+c)				805.00	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				402.50	
		Rate per cum = (a+b+c+d+e)				4427.50	
					<b>say</b>	<b>4428.00</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)				3540.00	Item 12.11 (C) ii

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 0.25 on (a+b+c)				885.00	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				442.50	
		Rate per cum = (a+b+c+d+e)				4867.50	
					<i>say</i>	<u>4868.00</u>	
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)				3409.00	Item 12.11 (C) ii
		d) Overhead charges @ 0.25 on (a+b+c)				852.25	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				426.13	
		Rate per cum = (a+b+c+d+e)				4687.38	
					<i>say</i>	<u>4687.00</u>	
'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)				3573.00	Item 12.11 (C) iii
		d) Overhead charges @ 0.25 on (a+b+c)				893.25	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				446.63	
		Rate per cum = (a+b+c+d+e)				4912.88	
					<i>say</i>	<u>4913.00</u>	
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)				3443.00	Item 12.11 (C) iii
		d) Overhead charges @ 0.25 on (a+b+c)				860.75	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				430.38	
		Rate per cum = (a+b+c+d+e)				4734.13	
					<i>say</i>	<u>4734.00</u>	
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)				2611.00	Item 12.8 (A)
		d) Overhead charges @ 0.25 on (a+b+c)				652.75	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				326.38	
		Rate per cum = (a+b+c+d+e)				3590.13	
					<i>say</i>	<u>3590.00</u>	
'12.11 E	(ii)	Grade M20 PCC					
		Same as Item 12.8(b) excluding formwork					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				2841.00	Item 12.8 (B) PCC
		d) Overhead charges @ 0.25 on (a+b+c)				710.25	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				355.13	
		Rate per cum = (a+b+c+d+e)				3906.38	
					<i>say</i>	<u>3906.00</u>	
'12.11 E	(iii)	Grade M25 PCC					
		Same as Item 12.8 (d) excluding formwork					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3143.00	Item 12.8 (D)
		d) Overhead charges @ 0.25 on (a+b+c)				785.75	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				392.88	
		Rate per cum = (a+b+c+d+e)				4321.63	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					<i>say</i>	<u>4322.00</u>	
12.11 E (iii)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3147.00	Item 12.8 (D)
		d) Overhead charges @ 0.25 on (a+b+c)				786.75	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				393.38	
		Rate per cum = (a+b+c+d+e)				4327.13	
					<i>say</i>	<u>4327.00</u>	
12.11 E	(iv)	Grade M30 PCC					
		Same as Item 12.8(f) excluding formwork					
	Case I	Using Concrete Mixer					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3176.00	Item 12.8 (F)
		d) Overhead charges @ 0.25 on (a+b+c)				794.00	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				397.00	
		Rate per cum = (a+b+c+d+e)				4367.00	
					<i>say</i>	<u>4367.00</u>	
12.11 E (iv)	Case II	Using Batching Plant, Transit Mixer and Crane/concrete pump					
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c)				3177.00	Item 12.8 (F)
		d) Overhead charges @ 0.25 on (a+b+c)				794.25	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				397.13	
		Rate per cum = (a+b+c+d+e)				4368.38	
					<i>say</i>	<u>4368.00</u>	
12.11	F	Well cap					
	(i)	RCC Grade M20					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	5.12	5462.00	27965.44	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		Form Work @ 4 per cent of a+b+c				1724.62	
		d) Overhead charges @ 0.25 on (a+b+c)				11210.00	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				5605.00	
		cost of 15 cum = a+b+c+d+e				61655.02	
		Rate per cum = (a+b+c+d+e)/15				4110.33	
					<i>say</i>	<u>4110.00</u>	
12.11 F (i)	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	40.92	5462.00	223505.04	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		<b>b) Labour</b>					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader (capacity 1 cum)	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		Formwork @ 4 per cent of (a+b+c)				13802.52	
		<b>d) Overhead charges @ 0.25 on (a+b+c)</b>				89716.35	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				44858.17	
		cost of 120 cum = a+b+c+d+e				493439.92	
		Rate per cum = (a+b+c+d+e)/120				4112.00	
					<i>say</i>	<b>4112.00</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	5462.00	33045.10	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		<b>b) Labour</b>					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		<b>c) Machinery</b>					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		Form Work @ 3.75 per cent of a+b+c				1807.31	
		<b>d) Overhead charges @ 0.25 on (a+b+c)</b>				12500.59	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				6250.30	
		cost of 15 cum = a+b+c+d+e				68753.27	
		Rate per cum = (a+b+c+d+e)/15				4583.55	
					<i>say</i>	<b>4584.00</b>	
12.11 F (ii)	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	48.40	5462.00	264360.80	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		<b>b) Labour</b>					
		Mate	day	0.84	171.00	143.64	L-12

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader (capacity 1 cum)	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		Formwork @ 3.75 per cent of ( a+b+c)				14471.95	
		d) Overhead charges @ 0.25 on (a+b+c)				100097.65	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				50048.82	
		cost of 120 cum = a+b+c+d+e				550537.06	
		Rate per cum = (a+b+c+d+e)/120				4587.81	
					<i>say</i>	<b>4588.00</b>	
12.11 F	(iii)	RCC Grade M30					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	6.10	5462.00	33318.20	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		Formwork @ 3.5 per cent of (a+b+c)				1696.39	
		d) Overhead charges @ 0.25 on (a+b+c)				12541.14	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6270.57	
		cost of 15 cum = a+b+c+d+e				68976.25	
		Rate per cum = (a+b+c+d+e)/15				4598.42	
					<i>say</i>	<b>4598.00</b>	
12.11 F (iii)	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	48.79	5462.00	266490.98	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Loader (capacity 1 cum)	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		Formwork @ 3.5 per cent of (a+b+c)				13581.71	
		d) Overhead charges @ 0.25 on (a+b+c)				100407.63	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				50203.82	
		cost of 120 cum = a+b+c+d+e				552241.98	
		Rate per cum = (a+b+c+d+e)/120				4602.02	
					<i>say</i>	<b>4602.00</b>	
12.11 F	(iv)	RCC Grade M35					
	Case I	Using Concrete Mixer					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	6.33	5462.00	34574.46	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		Formwork @ 3 per cent of (a+b+c)				1491.73	
		d) Overhead charges @ 0.25 on (a+b+c)				12804.04	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6402.02	
		cost of 15 cum = a+b+c+d+e				70422.21	
		Rate per cum = (a+b+c+d+e)/15				4694.81	
					<i>say</i>	<b>4695.00</b>	
12.11 F (iv)	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	50.64	5462.00	276595.68	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader (capacity 1 cum)	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	P&M-050 Lead= 1 km

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		Formwork @ 3 per cent of (a+b+c)				11944.61	
		d) Overhead charges @ 0.25 on (a+b+c)				102524.53	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				51262.27	
		cost of 120 cum = a+b+c+d+e				563884.92	
		Rate per cum = (a+b+c+d+e)/120				4699.04	
					<i>say</i>	<b>4699.00</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.					
'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>					
		a) Material					
		Cement	tonne	52.20	5462.00	285116.40	M-081
		Coarse Sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		Admixture	kg	206.00	150.00	30900.00	M-180
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader 1 cum capacity	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer 4 cum capacity for lead upto 1 km.	hour	15.00	1176.00	17640.00	P&M-049
		Transit Mixer 4 cum capacity for lead beyond 1 km.	tonne.km	300.L	6.00	1800.00	P&M-050 Lead= 1 km
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		Formwork @ 3 per cent on cost of concrete i.e. cost of material, labour and machinery				13127.23	
		d) Overhead charges @ 0.25 on (a+b+c)				112675.37	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				56337.68	
		cost of 120 cum = a+b+c+d+e				619714.52	
		Rate per cum = (a+b+c+d+e)/120				5164.29	
					<i>say</i>	<b>5164.00</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.					
		<i>Unit = Running Meter.</i>					
		<i>Taking output = 1 m</i>					
		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	171.00	20.52	L-12
		Sinker ( skilled )	day	1.00	200.00	200.00	L-15
		Sinking helper ( semi-skilled )	day	2.00	164.00	328.00	L-14

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	2.00	1617.00	3234.00	P&M-075
		Consumables in sinking @10 per cent of (b)				323.40	
		c) Overhead charges @ 0.25 on (a+b)				1026.48	
		d) Contractor's profit @ 0.1 on (a+b+c)				513.24	
		Rate per metre = (a+b+c+d)				5645.64	
					<i>say</i>	<u>5646.00</u>	
12.12 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking = 0.33 m per hour.					
		a) Labour					
		Mate	day	0.15	171.00	25.65	L-12
		Sinker	day	1.25	200.00	250.00	L-15
		Sinking helper ( semi-skilled )	day	2.50	164.00	410.00	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.00	1617.00	4851.00	P&M-075
		Consumables in sinking @10 per cent of (b)				485.10	
		c) Overhead charges @ 0.25 on (a+b)				1505.44	
		d) Contractor's profit @ 0.1 on (a+b+c)				752.72	
		Rate per metre = (a+b+c+d)				8279.91	
					<i>say</i>	<u>8280.00</u>	
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%	8694.00			
		12th m	5%	9129.00			
		13th m	5%	9585.00			
		14th m	5%	10064.00			
		15th m	5%	10567.00			
		16th m	5%	11095.00			
		17th m	5%	11650.00			
		18th m	5%	12233.00			
		19th m	5%	12845.00			
		20th m	5%	13487.00			
		Total Cost from 10m upto 20m		109349.00			
		<i>Avg Rate per metre</i>		<u>10935.00</u>			
12.12 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%	14499.00		17399.00	
		22nd m	7.5%	15586.00		18703.00	
		23rd m	7.5%	16755.00		20106.00	
		24th m	7.5%	18012.00		21614.00	
		25th m	7.5%	19363.00		23236.00	
		26th m	7.5%	20815.00		24978.00	
		27th m	7.5%	22376.00		26851.00	
		28th m	7.5%	24054.00		28865.00	
		29th m	7.5%	25858.00		31030.00	
		30th m	7.5%	27797.00		33356.00	
		Total Cost from 20m upto 30m		205115.00		246138.00	
		<i>Avg Rate per metre</i>		<u>20512.00</u>		<u>24614.00</u>	
12.12 A	(v)	Beyond 30m upto 40 m					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		(a)	(b) Including 20% for Kentledge		
		31st m	10%	30577.00	36692.00		
		32nd	10%	33635.00	40362.00		
		33rd m	10%	36999.00	44399.00		
		34th m	10%	40699.00	48839.00		
		35th m	10%	44769.00	53723.00		
		36th m	10%	49246.00	59095.00		
		37th m	10%	54171.00	65005.00		
		38th m	10%	59588.00	71506.00		
		39th m	10%	65547.00	78656.00		
		40th m	10%	72102.00	86522.00		
		Total Cost from 30m upto 40m		487333.00	584799.00		
		<b>Avg Rate per metre</b>		<b>48733.00</b>	<b>58480.00</b>		
12.12	B	Clayey Soil ( 6m dia. Well )					
		<i>Unit = Running Meter.</i>					
		<i>Taking output = 1 meter</i>					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking = 0.33 m per hour.					
	a)	Labour					
		Mate	day	0.15	171.00	25.65	L-12
		Sinker ( skilled )	day	1.50	200.00	300.00	L-15
		Sinking helper ( semi-skilled )	day	2.25	164.00	369.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories	hour	3.00	1617.00	4851.00	P&M-075
		Consumables in sinking @ 10 per cent of (b)				485.10	
	c)	Overhead charges @ 0.25 on (a+b)				1507.69	
	d)	Contractor's profit @ 0.1 on (a+b+c)				753.84	
		Rate per metre = (a+b+c+d)				8292.28	
					<i>say</i>	<b>8292.00</b>	
12.12 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking = 0.17 m per hour.					
	a)	Labour					
		Mate	day	0.30	171.00	51.30	L-12
		Sinker	day	3.00	200.00	600.00	L-15
		Sinking helper ( semi-skilled )	day	4.50	164.00	738.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1617.00	9702.00	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	2.00	784.00	1568.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1127.00	
	c)	Overhead charges @ 0.25 on (a+b)				3446.58	
	d)	Contractor's profit @ 0.1 on (a+b+c)				1723.29	
		Rate per metre = (a+b+c+d)				18956.16	
					<i>say</i>	<b>18956.00</b>	
12.12 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%	19904.00	20899.00		

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		12th m	5%	20899.00	21944.00		
		13th m	5%	21944.00	23041.00		
		14th m	5%	23041.00	24193.00		
		15th m	5%	24193.00	25403.00		
		16th m	5%	25403.00	26673.00		
		17th m	5%	26673.00	28007.00		
		18th m	5%	28007.00	29407.00		
		19th m	5%	29407.00	30877.00		
		20th m	5%	30877.00	32421.00		
		Total Cost from 10m upto 20m		250348.00	262865.00		
		<i>Avg Rate per metre</i>		<i>25035.00</i>	<i>26287.00</i>		
12.12 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 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%	33193.00	41491.00	43566.00	
		22nd m	7.5%	35682.00	44603.00	46833.00	
		23rd m	7.5%	38358.00	47948.00	50345.00	
		24th m	7.5%	41235.00	51544.00	54121.00	
		25th m	7.5%	44328.00	55410.00	58181.00	
		26th m	7.5%	47653.00	59566.00	62544.00	
		27th m	7.5%	51227.00	64034.00	67236.00	
		28th m	7.5%	55069.00	68836.00	72278.00	
		29th m	7.5%	59199.00	73999.00	77699.00	
		30th m	7.5%	63639.00	79549.00	83526.00	
		Total Cost from 20m upto 30m		469583.00	586980.00	616329.00	
		<i>Avg Rate per metre</i>		<i>46958.00</i>	<i>58698.00</i>	<i>61633.00</i>	
12.12 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)	(b) Including 20% for Kentledge	(b) Including 5% for dewatering, if required
		31st m	10%	70003.00	84004.00	88204.00	
		32nd	10%	77003.00	92404.00	97024.00	
		33rd m	10%	84703.00	101644.00	106726.00	
		34th m	10%	93173.00	111808.00	117398.00	
		35th m	10%	102490.00	122988.00	129137.00	
		36th m	10%	112739.00	135287.00	142051.00	
		37th m	10%	124013.00	148816.00	156257.00	
		38th m	10%	136414.00	163697.00	171882.00	
		39th m	10%	150055.00	180066.00	189069.00	
		40th m	10%	165061.00	198073.00	207977.00	
		Total Cost from 30m upto 40m		1115654.00	1338787.00	1405725.00	
		<i>Avg Rate per metre</i>		<i>111565.00</i>	<i>133879.00</i>	<i>140573.00</i>	
12.12	C	Soft Rock (6m dia well )					
		<i>Unit = Running Meter.</i>					
		<i>Taking output = 1 m</i>					
		Depth in Soft rock strata up to 3m					
		Rate of sinking = 0.25 m per hour.					
	a)	Labour					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate	day	0.92	171.00	157.32	L-12
		Sinker ( skilled )	day	3.00	200.00	600.00	L-15
		Sinking helper ( semi-skilled )	day	20.00	164.00	3280.00	L-14
		Diver	day	0.50	227.00	113.50	L-07
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	1617.00	6468.00	P&M-075
		Air compressor with pneumatic breakers	hour	3.50	784.00	2744.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				921.20	
		Add for dewatering @ of 5 per cent of (a+b), if required				714.20	
		<b>c) Overhead charges @ 0.25 on (a+b)</b>				3749.56	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1874.78	
		<b>Rate per metre = (a+b+c+d)</b>				20622.55	
					<b>say</b>	<b>20623.00</b>	
12.12	D	Hard Rock (6m dia well)					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 1 m</i>					
		Depth in hard rock strata upto 3 m					
		Rate of sinking = 0.17 m per hour.					
		<b>a) Material</b>					
		Gelatine 80 per cent	Kg	4.00	643.63	2574.50	M-104
		Electric Detonators	each	18.00	6.00	108.00	M-094/100
		<b>b) Labour</b>					
		Mate	day	1.56	171.00	266.76	L-12
		Driller	day	2.00	190.00	380.00	L-06
		Blaster	day	0.25	264.00	66.00	L-03
		Mazdoor	day	12.00	157.00	1884.00	L-13
		Mazdoor (Skilled)	day	4.00	200.00	800.00	L-15
		<b>c) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1617.00	9702.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	784.00	1568.00	P&M-063
		Dewatering @ 5 per cent of cost of (b+c), if required.				733.34	
		Consumables in sinking @ 10 per cent of cost of (c).				1127.00	
		<b>d) Overhead charges @ 0.25 on (a+b+c)</b>				4802.40	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				2401.20	
		<b>Rate per metre = (a+b+c+d+e)</b>				26413.20	
					<b>say</b>	<b>26413.00</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.					
		<i>Unit = Running Meter.</i>					
		<i>Taking output = 1 m</i>					
		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.					
		<b>a) Labour</b>					
		Mate	day	0.15	171.00	25.65	L-12
		Sinker ( skilled )	day	1.25	200.00	250.00	L-15
		Sinking helper ( semi-skilled )	day	2.50	164.00	410.00	L-14





## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.		(a)	(b) Including 20% for Kentledge		
		31st m	10%	44826.00	53791.00		
		32nd	10%	49309.00	59171.00		
		33rd m	10%	54240.00	65088.00		
		34th m	10%	59664.00	71597.00		
		35th m	10%	65630.00	78756.00		
		36th m	10%	72193.00	86632.00		
		37th m	10%	79412.00	95294.00		
		38th m	10%	87353.00	104824.00		
		39th m	10%	96088.00	115306.00		
		40th m	10%	105697.00	126836.00		
		Total Cost from 30m upto 40m		714412.00	857295.00		
		<b>Avg Rate per metre</b>		<b>71441.00</b>	<b>85730.00</b>		
12.13	B	Clayey Soil ( 7m dia. Well )					
		<i>Unit = Running Meter.</i>					
		<i>Taking output = 1 cum</i>					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking = 0.22 m per hour.					
	a)	Labour					
		Mate	day	0.18	171.00	30.78	L-12
		Sinker ( skilled )	day	1.50	200.00	300.00	L-15
		Sinking helper ( semi-skilled )	day	3.00	164.00	492.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.50	1617.00	7276.50	P&M-075
		Consumables in sinking @ 10 per cent of (b)				727.65	
	d)	Overhead charges @ 0.25 on (a+b)				2206.73	
	e)	Contractor's profit @ 0.1 on (a+b+c)				1103.37	
		Rate per metre = (a+b+c+d)				12137.03	
						<b>say 12137.00</b>	
12.13 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking = 0.17 m per hour.					
	a)	Labour					
		Mate	day	0.26	171.00	44.46	L-12
		Sinker	day	2.00	200.00	400.00	L-15
		Sinking helper ( semi-skilled )	day	4.00	164.00	656.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1617.00	9702.00	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.25	784.00	2548.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1225.00	
	c)	Overhead charges @ 0.25 on (a+b)				3643.87	
	d)	Contractor's profit @ 0.1 on (a+b+c)				1821.93	
		Rate per metre = (a+b+c+d)				20041.26	
						<b>say 20041.00</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%	21043.00	22095.00		

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		12th m	5%	22095.00	23200.00		
		13th m	5%	23200.00	24360.00		
		14th m	5%	24360.00	25578.00		
		15th m	5%	25578.00	26857.00		
		16th m	5%	26857.00	28200.00		
		17th m	5%	28200.00	29610.00		
		18th m	5%	29610.00	31091.00		
		19th m	5%	31091.00	32646.00		
		20th m	5%	32646.00	34278.00		
		Total Cost from 10m upto 20m		264680.00	277915.00		
		<b>Avg Rate per metre</b>		<b>26468.00</b>	<b>27792.00</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%	35094.00	43868.00	46061.00	
		22nd	7.5%	37726.00	47158.00	49516.00	
		23rd m	7.5%	40555.00	50694.00	53229.00	
		24th m	7.5%	43597.00	54496.00	57221.00	
		25th m	7.5%	46867.00	58584.00	61513.00	
		26th m	7.5%	50382.00	62978.00	66127.00	
		27th m	7.5%	54161.00	67701.00	71086.00	
		28th m	7.5%	58223.00	72779.00	76418.00	
		29th m	7.5%	62590.00	78238.00	82150.00	
		30th m	7.5%	67284.00	84105.00	88310.00	
		Total Cost from 20m upto 30m		496479.00	620601.00	651631.00	
		<b>Avg Rate per metre</b>		<b>49648.00</b>	<b>62060.00</b>	<b>65163.00</b>	
12.13 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%	74012.00	88814.00	93255.00	
		32nd	10%	81413.00	97696.00	102581.00	
		33rd m	10%	89554.00	107465.00	112838.00	
		34th m	10%	98509.00	118211.00	124122.00	
		35th m	10%	108360.00	130032.00	136534.00	
		36th m	10%	119196.00	143035.00	150187.00	
		37th m	10%	131116.00	157339.00	165206.00	
		38th m	10%	144228.00	173074.00	181728.00	
		39th m	10%	158651.00	190381.00	199900.00	
		40th m	10%	174516.00	209419.00	219890.00	
		Total Cost from 30m upto 40m		1179555.00	1415466.00	1486241.00	
		<b>Avg Rate per metre</b>		<b>117956.00</b>	<b>141547.00</b>	<b>148624.00</b>	
12.13	C	Soft Rock ( 7m dia well )					
		<b>Unit = Running Meter.</b>					
		<b>Taking output = 1 m</b>					
		Depth in soft rock strata upto 3m					
		Rate of sinking = 0.22 m per hour.					
		a) Labour					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate	day	0.58	171.00	99.18	L-12
		Sinker ( skilled )	day	4.00	200.00	800.00	L-15
		Sinking helper ( semi-skilled )	day	10.00	164.00	1640.00	L-14
		Diver	day	0.75	227.00	170.25	L-07
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.50	1617.00	7276.50	P&M-075
		Air compressor with pneumatic breakers	hour	3.75	784.00	2940.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1021.65	
		Add for dewatering @ of 5 per cent of (a+b), if required				646.30	
		<b>c) Overhead charges @ 0.25 on (a+b)</b>				3648.47	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1824.23	
		<b>Rate per metre = (a+b+c+d)</b>				20066.58	
					<b>say</b>	<b>20067.00</b>	
12.13	D	Hard Rock ( 7m dia well )					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 1 m</i>					
		Depth in Hard rock strata up to 3 m					
		Rate of sinking = 0.17 m per hour.					
		<b>a) Material</b>					
		Gelatine 80 per cent	Kg	7.00	643.63	4505.38	M-104
		Electric Detonators	each	30.00	6.00	180.00	M-094/100
		<b>b) Labour</b>					
		Mate	day	1.60	171.00	273.60	L-12
		Driller	day	2.00	190.00	380.00	L-06
		Blaster	day	0.25	264.00	66.00	L-03
		Mazdoor	day	18.00	157.00	2826.00	L-13
		Mazdoor (Skilled)	day	4.00	200.00	800.00	L-15
		Diver	day	0.50	227.00	113.50	L-07
		<b>c) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1617.00	9702.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	784.00	1568.00	P&M-063
		Dewatering @ 5 per cent of cost of (b+c), if required.				786.46	
		Consumables in sinking @ 10 per cent of cost of (c).				1205.65	
		<b>d) Overhead charges @ 0.25 on (a+b+c)</b>				5601.64	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				2800.82	
		<b>Rate per metre = (a+b+c+d+e)</b>				30809.04	
					<b>say</b>	<b>30809.00</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>					
		Diameter of well - 8 m.					
	A	Sandy Soil					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.25 m/hour					
		<b>a) Labour</b>					
		Mate	day	0.18	171.00	30.78	L-12
		Sinker ( skilled )	day	1.50	200.00	300.00	L-15
		Sinking helper ( semi-skilled )	day	3.00	164.00	492.00	L-14

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	1617.00	6468.00	P&M-075
		Consumables in sinking @10 per cent of (b)				646.80	
		c) Overhead charges @ 0.25 on (a+b)				1984.40	
		d) Contractor's profit @ 0.1 on (a+b+c)				992.20	
		Rate per metre = (a+b+c+d)				10914.17	
						<b>say 10914.00</b>	
12.14 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.20 m/hour					
		a) Labour					
		Mate	day	0.25	171.00	42.75	L-12
		Sinker	day	1.75	200.00	350.00	L-15
		Sinking helper ( semi-skilled )	day	3.50	164.00	574.00	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	1617.00	8085.00	P&M-075
		Consumables in sinking @10 per cent of (b)				808.50	
		c) Overhead charges @ 0.25 on (a+b)				2465.06	
		d) Contractor's profit @ 0.1 on (a+b+c)				1232.53	
		Rate per metre = (a+b+c+d)				13557.84	
						<b>say 13558.00</b>	
12.14 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%	14236.00			
		12th m	5%	14948.00			
		13th m	5%	15695.00			
		14th m	5%	16480.00			
		15th m	5%	17304.00			
		16th m	5%	18169.00			
		17th m	5%	19077.00			
		18th m	5%	20031.00			
		19th m	5%	21033.00			
		20th m	5%	22085.00			
		Total Cost from 10m upto 20m		179058.00			
		<b>Avg Rate per metre</b>		<b>17906.00</b>			
12.14 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%	23741.00		28489.00	
		22nd m	7.5%	25522.00		30626.00	
		23rd m	7.5%	27436.00		32923.00	
		24th m	7.5%	29494.00		35393.00	
		25th m	7.5%	31706.00		38047.00	
		26th m	7.5%	34084.00		40901.00	
		27th m	7.5%	36640.00		43968.00	
		28th m	7.5%	39388.00		47266.00	
		29th m	7.5%	42342.00		50810.00	
		30th m	7.5%	45518.00		54622.00	
		Total Cost from 20m upto 30m		335871.00		403045.00	
		<b>Avg Rate per metre</b>		<b>33587.00</b>		<b>40306.00</b>	
12.14 A	(v)	Beyond 30m upto 40 m					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc.		(a)	(b) Including 20% for Kentledge		
		31st m	10%	50070.00	60084.00		
		32nd	10%	55077.00	66092.00		
		33rd m	10%	60585.00	72702.00		
		34th m	10%	66644.00	79973.00		
		35th m	10%	73308.00	87970.00		
		36th m	10%	80639.00	96767.00		
		37th m	10%	88703.00	106444.00		
		38th m	10%	97573.00	117088.00		
		39th m	10%	107330.00	128796.00		
		40th m	10%	118063.00	141676.00		
		Total Cost from 30m upto 40m		797992.00	957590.00		
		<b>Avg Rate per metre</b>		<b>79799.00</b>	<b>95759.00</b>		
12.14	B	Clayey Soil ( 8m dia. Well )					
		<i>Unit = Running Meter.</i>					
		<i>Taking output = 1 meter</i>					
	(i)	Depth from bed level upto 3.0 M					
		Rate of sinking @ 0.18 m/hour					
		a) Labour					
		Mate	day	0.22	171.00	37.62	L-12
		Sinker ( skilled )	day	2.00	200.00	400.00	L-15
		Sinking helper ( semi-skilled )	hour	3.50	164.00	574.00	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.		5.50	1617.00	8893.50	P&M-075
		Consumables in sinking @ 10 per cent of (b)				889.35	
		c) Overhead charges @ 0.25 on (a+b)				2698.62	
		d) Contractor's profit @ 0.1 on (a+b+c)				1349.31	
		Rate per metre = (a+b+c+d)				14842.40	
						<b>say 14842.00</b>	
12.14 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.17 m/hour					
		a) Labour					
		Mate	day	0.32	171.00	54.72	L-12
		Sinker	day	2.50	200.00	500.00	L-15
		Sinking helper ( semi-skilled )	day	4.50	164.00	738.00	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1617.00	9702.00	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.50	784.00	2744.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1244.60	
		c) Overhead charges @ 0.25 on (a+b)				3745.83	
		d) Contractor's profit @ 0.1 on (a+b+c)				1872.92	
		Rate per metre = (a+b+c+d)				20602.07	
						<b>say 20602.00</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%	21632.00	22714.00		

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		12th m	5%	22714.00	23850.00		
		13th m	5%	23850.00	25043.00		
		14th m	5%	25043.00	26295.00		
		15th m	5%	26295.00	27610.00		
		16th m	5%	27610.00	28991.00		
		17th m	5%	28991.00	30441.00		
		18th m	5%	30441.00	31963.00		
		19th m	5%	31963.00	33561.00		
		20th m	5%	33561.00	35239.00		
		Total Cost from 10m upto 20m		272100.00	285707.00		
		<b>Avg Rate per metre</b>		<b>27210.00</b>	<b>28571.00</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%	36078.00	45098.00	47353.00	
		22nd	7.5%	38784.00	48480.00	50904.00	
		23rd m	7.5%	41693.00	52116.00	54722.00	
		24th m	7.5%	44820.00	56025.00	58826.00	
		25th m	7.5%	48182.00	60228.00	63239.00	
		26th m	7.5%	51796.00	64745.00	67982.00	
		27th m	7.5%	55681.00	69601.00	73081.00	
		28th m	7.5%	59857.00	74821.00	78562.00	
		29th m	7.5%	64346.00	80433.00	84455.00	
		30th m	7.5%	69172.00	86465.00	90788.00	
		Total Cost from 20m upto 30m		510409.00	638012.00	669912.00	
		<b>Avg Rate per metre</b>		<b>51041.00</b>	<b>63801.00</b>	<b>66991.00</b>	
12.14 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%	76089.00	91307.00	95872.00	
		32nd	10%	83698.00	100438.00	105460.00	
		33rd m	10%	92068.00	110482.00	116006.00	
		34th m	10%	101275.00	121530.00	127607.00	
		35th m	10%	111403.00	133684.00	140368.00	
		36th m	10%	122543.00	147052.00	154405.00	
		37th m	10%	134797.00	161756.00	169844.00	
		38th m	10%	148277.00	177932.00	186829.00	
		39th m	10%	163105.00	195726.00	205512.00	
		40th m	10%	179416.00	215299.00	226064.00	
		Total Cost from 30m upto 40m		1212671.00	1455206.00	1527967.00	
		<b>Avg Rate per metre</b>		<b>121267.00</b>	<b>145521.00</b>	<b>152797.00</b>	
12.14	C	Soft Rock ( 8m dia well )					
		<b>Unit = Running Meter.</b>					
		<b>Taking output = 1 m</b>					
		Depth in soft rock strata upto 3m					
		Rate of sinking @ 0.20 m/hour					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Labour					
		Mate	day	0.68	171.00	116.28	L-12
		Sinker ( skilled )	day	4.00	200.00	800.00	L-15
		Sinking helper ( semi-skilled )	day	12.00	164.00	1968.00	L-14
		Diver	day	1.00	227.00	227.00	L-07
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	1617.00	8085.00	P&M-075
		Air compressor with pneumatic breakers	hour	3.75	784.00	2940.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1102.50	
		Add for dewatering @ of 5 per cent of (a+b), if required				761.94	
		c) Overhead charges @ 0.25 on (a+b)				4000.18	
		d) Contractor's profit @ 0.1 on (a+b+c)				2000.09	
		Rate per metre = (a+b+c+d)				22000.99	
					<i>say</i>	<u>22001.00</u>	
12.14	D	Hard Rock ( 8m dia well )					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 1 m</i>					
		Depth in hard rock strata upto 3 m					
		Rate of sinking @ 0.17 m/hour					
		a) Material					
		Gelatine 80 per cent	Kg	8.00	643.63	5149.00	M-104
		Electric Detonators	each	32.00	6.00	192.00	M-094/100
		b) Labour					
		Mate	day	1.09	171.00	186.39	L-12
		Driller	day	2.00	190.00	380.00	L-06
		Blaster	day	0.25	264.00	66.00	L-03
		Mazdoor	day	20.00	157.00	3140.00	L-13
		Mazdoor (Skilled)	day	4.00	200.00	800.00	L-15
		c) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1617.00	9702.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.00	784.00	1568.00	P&M-063
		Dewatering @ 5 per cent of cost of (b+c), if required.				792.12	
		Consumables in sinking @ 10 per cent of cost of (b).				457.24	
		d) Overhead charges @ 0.25 on (a+b+c)				5608.19	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				2804.09	
		Rate per metre = (a+b+c+d+e)				30845.03	
					<i>say</i>	<u>30845.00</u>	
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>					
		Diameter of well - 9 m.					
	A	Sandy Soil					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.25 m/hour					
		a) Labour					
		Mate	day	0.19	171.00	32.49	L-12
		Sinker ( skilled )	day	1.50	200.00	300.00	L-15



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Sinking helper ( semi-skilled )	day	3.25	164.00	533.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	1617.00	6468.00	P&M-075
		Consumables in sinking @10 per cent of (b)				646.80	
		<b>c) Overhead charges @ 0.25 on (a+b)</b>				1995.07	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				997.54	
		Rate per metre = (a+b+c+d)				10972.90	
					<b>say</b>	<b><u>10973.00</u></b>	
12.15 A	(ii)	<b>Beyond 3m upto 10m depth</b>					
		Rate of sinking @ 0.18 m/hour					
		<b>a) Labour</b>					
		Mate	day	0.27	171.00	46.17	L-12
		Sinker	day	1.75	200.00	350.00	L-15
		Sinking helper ( semi-skilled )	day	4.00	164.00	656.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.50	1617.00	8893.50	P&M-075
		Consumables in sinking @10 per cent of (b)				889.35	
		<b>c) Overhead charges @ 0.25 on (a+b)</b>				2708.76	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				1354.38	
		Rate per metre = (a+b+c+d)				14898.15	
					<b>say</b>	<b><u>14898.00</u></b>	
12.15 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%	15643.00			
		12th m	5%	16425.00			
		13th m	5%	17246.00			
		14th m	5%	18108.00			
		15th m	5%	19013.00			
		16th m	5%	19964.00			
		17th m	5%	20962.00			
		18th m	5%	22010.00			
		19th m	5%	23111.00			
		20th m	5%	24267.00			
		Total Cost from 10m upto 20m		196749.00			
		<b>Avg Rate per metre</b>			<b><u>19675.00</u></b>		
12.15 A	(iv)	<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%	26087.03		31304.00	
		22nd m	7.5%	28044.00		33653.00	
		23rd m	7.5%	30147.00		36176.00	
		24th m	7.5%	32408.00		38890.00	
		25th m	7.5%	34839.00		41807.00	
		26th m	7.5%	37452.00		44942.00	
		27th m	7.5%	40261.00		48313.00	
		28th m	7.5%	43281.00		51937.00	
		29th m	7.5%	46527.00		55832.00	
		30th m	7.5%	50017.00		60020.00	
		Total Cost from 20m upto 30m		369063.03		442874.00	
		<b>Avg Rate per metre</b>			<b><u>36906.00</u></b>	<b><u>44287.00</u></b>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.15 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%	55018.70	66022.00		
		32nd	10%	60521.00	72625.00		
		33rd m	10%	66573.00	79888.00		
		34th m	10%	73230.00	87876.00		
		35th m	10%	80553.00	96664.00		
		36th m	10%	88608.00	106330.00		
		37th m	10%	97469.00	116963.00		
		38th m	10%	107216.00	128659.00		
		39th m	10%	117938.00	141526.00		
		40th m	10%	129732.00	155678.00		
		Total Cost from 30m upto 40m		876858.70	1052231.00		
		<b>Avg Rate per metre</b>		<b>87686.00</b>	<b>105223.00</b>		
12.15	B	Clayey Soil ( 9m dia. Well )					
		<b>Unit = Running Meter.</b>					
		<b>Taking output = 1 cum</b>					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking 0.17 m / hour					
	a)	Labour					
		Mate	day	0.24	171.00	41.04	L-12
		Sinker ( skilled )	day	2.25	200.00	450.00	L-15
		Sinking helper ( semi-skilled )	day	3.75	164.00	615.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.75	1617.00	9297.75	P&M-075
		Consumables in sinking @ 10 per cent of (b)				929.78	
	c)	Overhead charges @ 0.25 on (a+b)				2833.39	
	d)	Contractor's profit @ 0.1 on (a+b+c)				1416.70	
		Rate per metre = (a+b+c+d)				15583.65	
						<b>say 15584.00</b>	
12.15 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking 0.15 m / hour					
	a)	Labour					
		Mate	day	0.34	171.00	58.14	L-12
		Sinker	day	2.50	200.00	500.00	L-15
		Sinking helper ( semi-skilled )	day	5.00	164.00	820.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	1617.00	10510.50	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	3.75	784.00	2940.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1345.05	
	c)	Overhead charges @ 0.25 on (a+b)				4043.42	
	d)	Contractor's profit @ 0.1 on (a+b+c)				2021.71	
		Rate per metre = (a+b+c+d)				22238.82	
						<b>say 22239.00</b>	
12.15 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					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b	Add for dewatering @ 5 per cent of cost, if required.		(a)	(b) Including for dewatering @ 5% of cost, if required	
			11th m	5%	23351.00	24519.00	
			12th m	5%	24519.00	25745.00	
			13th m	5%	25745.00	27032.00	
			14th m	5%	27032.00	28384.00	
			15th m	5%	28384.00	29803.00	
			16th m	5%	29803.00	31293.00	
			17th m	5%	31293.00	32858.00	
			18th m	5%	32858.00	34501.00	
			19th m	5%	34501.00	36226.00	
			20th m	5%	36226.00	38037.00	
			Total Cost from 10m upto 20m		293712.00	308398.00	
			<b>Avg Rate per metre</b>		<b>29371.00</b>	<b>30840.00</b>	
12.15 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%	38943.00	48679.00	51113.00
			22nd	7.5%	41864.00	52330.00	54947.00
			23rd m	7.5%	45004.00	56255.00	59068.00
			24th m	7.5%	48379.00	60474.00	63498.00
			25th m	7.5%	52007.00	65009.00	68259.00
			26th m	7.5%	55908.00	69885.00	73379.00
			27th m	7.5%	60101.00	75126.00	78882.00
			28th m	7.5%	64609.00	80761.00	84799.00
			29th m	7.5%	69455.00	86819.00	91160.00
			30th m	7.5%	74664.00	93330.00	97997.00
			Total Cost from 20m upto 30m		550934.00	688668.00	723102.00
			<b>Avg Rate per metre</b>		<b>55093.00</b>	<b>68867.00</b>	<b>72310.00</b>
12.15 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%	82130.00	98556.00	103484.00
			32nd	10%	90343.00	108412.00	113833.00
			33rd m	10%	99377.00	119252.00	125215.00
			34th m	10%	109315.00	131178.00	137737.00
			35th m	10%	120247.00	144296.00	151511.00
			36th m	10%	132272.00	158726.00	166662.00
			37th m	10%	145499.00	174599.00	183329.00
			38th m	10%	160049.00	192059.00	201662.00
			39th m	10%	176054.00	211265.00	221828.00
			40th m	10%	193659.00	232391.00	244011.00
			Total Cost from 30m upto 40m		1308945.00	1570734.00	1649272.00
			<b>Avg Rate per metre</b>		<b>130895.00</b>	<b>157073.00</b>	<b>164927.00</b>
12.15		C	Soft Rock ( 9m dia well )				

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<i>Unit = Running Meter.</i>					
		<i>Taking output = 1 m</i>					
		Depth in soft rock strata up to 3m					
		Rate of sinking 0.15 m / hour					
		<b>a) Labour</b>					
		Mate	day	0.76	171.00	129.96	L-12
		Sinker ( skilled )	day	4.00	200.00	800.00	L-15
		Sinking helper ( semi-skilled )	day	14.00	164.00	2296.00	L-14
		Diver	day	1.20	227.00	272.40	L-07
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	1617.00	10510.50	P&M-075
		Air compressor with pneumatic breakers	hour	4.00	784.00	3136.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1364.65	
		Add for dewatering @ of 10 per cent of (a+b), if required				1850.95	
		<b>c) Overhead charges @ 0.25 on (a+b)</b>				5090.12	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2545.06	
		Rate per metre = (a+b+c+d)				27995.63	
						<i>say</i> <b>27996.00</b>	
12.15	D	Hard Rock ( 9m dia well )					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 1 m</i>					
		Depth in hard rock strata upto 3 m					
		Rate of sinking 0.15 m / hour					
		<b>a) Material</b>					
		Gelatine 80 per cent	Kg	10.00	643.63	6436.25	M-104
		Electric Detonators	each	40.00	6.00	240.00	M-094/100
		<b>b) Labour</b>					
		Mate	day	1.17	171.00	200.07	L-12
		Driller	day	2.00	190.00	380.00	L-06
		Blaster	day	0.25	264.00	66.00	L-03
		Mazdoor	day	22.00	157.00	3454.00	L-13
		Mazdoor (Skilled)	day	4.00	200.00	800.00	L-15
		Diver	day	1.00	227.00	227.00	L-07
		<b>c) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	7.00	1617.00	11319.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer for drilling.	hour	2.50	784.00	1960.00	P&M-063
		Dewatering @ 5 per cent of cost of (b+c), if required.				920.30	
		Consumables in sinking @ 10 per cent of cost of (b).				512.71	
		<b>d) Overhead charges @ 0.25 on (a+b+c)</b>				6628.83	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				3314.42	
		Rate per metre = (a+b+c+d+e)				36458.58	
						<i>say</i> <b>36459.00</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.					
	A	Sandy Soil					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking 0.20 m / hour					
	a)	Labour					
		Mate	day	0.20	171.00	34.20	L-12
		Sinker ( skilled )	day	1.50	200.00	300.00	L-15
		Sinking helper ( semi-skilled )	day	3.50	164.00	574.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	1617.00	8085.00	P&M-075
		Consumables in sinking @10 per cent of (b)				808.50	
	c)	Overhead charges @ 0.25 on (a+b)				2450.43	
	d)	Contractor's profit @ 0.1 on (a+b+c)				1225.21	
		Rate per metre = (a+b+c+d)				13477.34	
						<b>say 13477.00</b>	
12.16 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking 0.17 m / hour					
	a)	Labour					
		Mate	day	0.31	171.00	53.01	L-12
		Sinker	day	2.00	200.00	400.00	L-15
		Sinking helper ( semi-skilled )	day	4.25	164.00	697.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.75	1617.00	9297.75	P&M-075
		Consumables in sinking @10 per cent of (b)				929.78	
	c)	Overhead charges @ 0.25 on (a+b)				2844.38	
	d)	Contractor's profit @ 0.1 on (a+b+c)				1422.19	
		Rate per metre = (a+b+c+d)				15644.11	
						<b>say 15644.00</b>	
12.16 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%	16426.00			
		12th m	5%	17247.00			
		13th m	5%	18109.00			
		14th m	5%	19014.00			
		15th m	5%	19965.00			
		16th m	5%	20963.00			
		17th m	5%	22011.00			
		18th m	5%	23112.00			
		19th m	5%	24268.00			
		20th m	5%	25481.00			
		Total Cost from 10m upto 20m		206596.00			
		<b>Avg Rate per metre</b>					<b>20660.00</b>
12.16 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%	27392.00		32870.00	
		22nd m	7.5%	29446.00		35335.00	
		23rd m	7.5%	31654.00		37985.00	
		24th m	7.5%	34028.00		40834.00	
		25th m	7.5%	36580.00		43896.00	
		26th m	7.5%	39324.00		47189.00	
		27th m	7.5%	42273.00		50728.00	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		28th m	7.5%	45443.00	54532.00		
		29th m	7.5%	48851.00	58621.00		
		30th m	7.5%	52515.00	63018.00		
		Total Cost from 20m upto 30m		387506.00	465008.00		
		<b>Avg Rate per metre</b>		<b>38751.00</b>	<b>46501.00</b>		
12.16 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%	57767.00	69320.00		
		32nd	10%	63544.00	76253.00		
		33rd m	10%	69898.00	83878.00		
		34th m	10%	76888.00	92266.00		
		35th m	10%	84577.00	101492.00		
		36th m	10%	93035.00	111642.00		
		37th m	10%	102339.00	122807.00		
		38th m	10%	112573.00	135088.00		
		39th m	10%	123830.00	148596.00		
		40th m	10%	136213.00	163456.00		
		Total Cost from 30m upto 40m		920664.00	1104798.00		
		<b>Avg Rate per metre</b>		<b>92066.00</b>	<b>110480.00</b>		
12.16	B	Clayey Soil (10m dia. Well )					
		<b>Unit = Running Meter</b>					
		<b>Taking output = 1 cum</b>					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking 0.18m/hour.					
	a)	Labour					
		Mate	day	0.25	171.00	42.75	L-12
		Sinker ( skilled )	day	2.50	200.00	500.00	L-15
		Sinking helper ( semi-skilled )	day	5.50	164.00	902.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1617.00	9702.00	P&M-075
		Consumables in sinking @ 10 per cent of (b)				970.20	
	c)	Overhead charges @ 0.25 on (a+b)				3029.24	
	d)	Contractor's profit @ 0.1 on (a+b+c)				1514.62	
		Rate per metre = (a+b+c+d)				16660.81	
						<b>say 16661.00</b>	
12.16 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking 0.15m/hour.					
	a)	Labour					
		Mate	day	0.40	171.00	68.40	L-12
		Sinker	day	3.00	200.00	600.00	L-15
		Sinking helper ( semi-skilled )	day	5.50	164.00	902.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1617.00	9702.00	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay	hour	4.00	784.00	3136.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1283.80	
	c)	Overhead charges @ 0.25 on (a+b)				3923.05	
	d)	Contractor's profit @ 0.1 on (a+b+c)				1961.53	
		Rate per metre = (a+b+c+d)				21576.78	
						<b>say 21577.00</b>	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
12.16 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%	22656.00	23789.00		
		12th m	5%	23789.00	24978.00		
		13th m	5%	24978.00	26227.00		
		14th m	5%	26227.00	27538.00		
		15th m	5%	27538.00	28915.00		
		16th m	5%	28915.00	30361.00		
		17th m	5%	30361.00	31879.00		
		18th m	5%	31879.00	33473.00		
		19th m	5%	33473.00	35147.00		
		20th m	5%	35147.00	36904.00		
		Total Cost from 10m upto 20m		284963.00	299211.00		
		<b>Avg Rate per metre</b>		<b>28496.00</b>	<b>29921.00</b>		
12.16 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%	37783.00	47229.00	49590.00	
		22nd	7.5%	40617.00	50771.00	53310.00	
		23rd m	7.5%	43663.00	54579.00	57308.00	
		24th m	7.5%	46938.00	58673.00	61607.00	
		25th m	7.5%	50458.00	63073.00	66227.00	
		26th m	7.5%	54242.00	67803.00	71193.00	
		27th m	7.5%	58310.00	72888.00	76532.00	
		28th m	7.5%	62683.00	78354.00	82272.00	
		29th m	7.5%	67384.00	84230.00	88442.00	
		30th m	7.5%	72438.00	90548.00	95075.00	
		Total Cost from 20m upto 30m		534516.00	668148.00	701556.00	
		<b>Avg Rate per metre</b>		<b>53452.00</b>	<b>66815.00</b>	<b>70156.00</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%	79682.00	95618.00	100399.00	
		32nd	10%	87650.00	105180.00	110439.00	
		33rd m	10%	96415.00	115698.00	121482.90	
		34th m	10%	106057.00	127268.00	133631.40	
		35th m	10%	116663.00	139996.00	146995.80	
		36th m	10%	128329.00	153995.00	161694.75	
		37th m	10%	141162.00	169394.00	177863.70	
		38th m	10%	155278.00	186334.00	195650.70	
		39th m	10%	170806.00	204967.00	215215.35	
		40th m	10%	187887.00	225464.00	236737.20	
		Total Cost from 30m upto 40m		1269929.00	1523914.00	1600109.80	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<i>Avg Rate per metre</i>		<i>126993.00</i>	<i>152391.00</i>	<i>160011.00</i>	
12.16	C	Soft Rock (10m dia well )					
		<i>Unit = Running Meter.</i>					
		<i>Taking output = 1 m</i>					
		Depth in soft rock strata upto 3m					
		Rate of sinking 0.14m/hour.					
		a) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Sinker ( skilled )	day	4.00	200.00	800.00	L-15
		Sinking helper ( semi-skilled )	day	16.00	164.00	2624.00	L-14
		Diver	day	1.40	227.00	317.80	L-07
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	7.00	1617.00	11319.00	P&M-075
		Air compressor with pneumatic breakers	hour	4.25	784.00	3332.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1465.10	
		Add for dewatering @ 5 per cent of cost, if required				805.81	
		c) Overhead charges @ 0.25 on (a+b)				5202.69	
		d) Contractor's profit @ 0.1 on (a+b+c)				2601.35	
		Rate per metre = (a+b+c+d)				28614.80	
					<i>say</i>	<i>28615.00</i>	
12.16	D	Hard Rock (10m dia well )					
		<i>Unit = Running Meter.</i>					
		<i>Taking output = 1 m</i>					
		Depth in hard rock strata upto 3 m					
		Rate of sinking 0.12 m/ hour.					
		a) Material					
		Gelatine 80 per cent	Kg	11.00	643.63	7079.88	M-104
		Electric Detonators	each.	44.00	6.00	264.00	M-094/100
		b) Labour					
		Mate	day	1.27	171.00	217.17	L-12
		Driller	day	2.00	190.00	380.00	L-06
		Blaster	day	0.25	264.00	66.00	L-03
		Mazdoor	day	24.00	157.00	3768.00	L-13
		Mazdoor (Skilled)	day	4.00	200.00	800.00	L-15
		c) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.50	1617.00	13744.50	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.00	784.00	2352.00	P&M-063
		Dewatering @ 5 per cent of cost (c), if required.				804.83	
		Consumables in sinking @ 10 per cent of cost of (b+c).				2213.25	
		d) Overhead charges @ 0.25 on (a+b+c)				7922.40	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				3961.20	
		Rate per metre = (a+b+c+d+e)				43573.23	
					<i>say</i>	<i>43573.00</i>	
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.					



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	A	Sandy Soil					
	(i)	Depth from bed level upto 3.0 M					
		Rate of sinking @ 0.15 m/hour					
	a)	Labour					
		Mate	day	0.21	171.00	35.91	L-12
		Sinker ( skilled )	day	1.50	200.00	300.00	L-15
		Sinking helper (semi-skilled)	day	3.30	164.00	541.20	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1617.00	9702.00	P&M-075
		Consumables in sinking @10 per cent of (b)				970.20	
	c)	Overhead charges @ 0.25 on (a+b)				2887.33	
	d)	Contractor's profit @ 0.1 on (a+b+c)				1443.66	
		Cost for 0.5 m = a+b+c				15880.30	
		Rate per metre = (a+b+c) / 0.50				31760.60	
					<i>say</i>	<b>31761.00</b>	
12.17 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.13 m/hour					
	a)	Labour					
		Mate	day	0.32	171.00	54.72	L-12
		Sinker	day	2.00	200.00	400.00	L-15
		Sinking helper (semi-skilled)	day	4.50	164.00	738.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	4.00	1617.00	6468.00	P&M-075
		Consumables in sinking @10 per cent of (b)				646.80	
	c)	Overhead charges @ 0.25 on (a+b+c)				2076.88	
	d)	Contractor's profit @ 0.1 on (a+b+c+d)				1038.44	
		Cost for 0.5m = a+b+c+d				11422.84	
		Rate per metre = (a+b+c+d)/0.50				22845.68	
							<i>say</i>
						<b>22846.00</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%	23988.00			
		12th m	5%	25187.00			
		13th m	5%	26446.00			
		14th m	5%	27768.00			
		15th m	5%	29156.00			
		16th m	5%	30614.00			
		17th m	5%	32145.00			
		18th m	5%	33752.00			
		19th m	5%	35440.00			
		20th m	5%	37212.00			
		Total Cost from 10m upto 20m		301708.00			
		<b>Avg Rate per metre</b>					<b>30171.00</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%	40003.00	48004.00		
		22nd m	7.5%	43003.00	51604.00		
		23rd m	7.5%	46228.00	55474.00		
		24th m	7.5%	49695.00	59634.00		

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		25th m	7.5%	53422.00	64106.00		
		26th m	7.5%	57429.00	68915.00		
		27th m	7.5%	61736.00	74083.00		
		28th m	7.5%	66366.00	79639.00		
		29th m	7.5%	71343.00	85612.00		
		30th m	7.5%	76694.00	92033.00		
		Total Cost from 20m upto 30m		565919.00	679104.00		
		<b>Avg Rate per metre</b>		<b>56592.00</b>	<b>67910.00</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%	84363.00	101236.00		
		32nd	10%	92799.00	111359.00		
		33rd m	10%	102079.00	122495.00		
		34th m	10%	112287.00	134744.00		
		35th m	10%	123516.00	148219.00		
		36th m	10%	135868.00	163042.00		
		37th m	10%	149455.00	179346.00		
		38th m	10%	164401.00	197281.00		
		39th m	10%	180841.00	217009.00		
		40th m	10%	198925.00	238710.00		
		Total Cost from 30m upto 40m		1344534.00	1613441.00		
		<b>Avg Rate per metre</b>		<b>134453.00</b>	<b>161344.00</b>		
12.17	B	Clayey Soil (11 m dia. Well )					
		<b>Unit = Running Meter</b>					
		<b>Taking output = 0.50 meter</b>					
	(i)	Depth from bed level upto 3.0 M					
		Rate of sinking @ 0.10 m/hour					
	a)	Labour					
		Mate	day	0.26	171.00	44.46	L-12
		Sinker ( skilled )	day	2.50	200.00	500.00	L-15
		Sinking helper (semi-skilled)	day	4.00	164.00	656.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.00	1617.00	8085.00	P&M-075
		Consumables in sinking @ 10 per cent of (b)				808.50	
	c)	Overhead charges @ 0.25 on (a+b)				2523.49	
	d)	Contractor's profit @ 0.1 on (a+b+c)				1261.75	
		Cost for 0.5m = a+b+c+d				13879.20	
		Rate per metre = (a+b+c+d)/0.50				27758.39	
					<b>say</b>	<b>27758.00</b>	
12.17 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.08 m/hour					
	a)	Labour					
		Mate	day	0.43	171.00	73.53	L-12
		Sinker	day	3.50	200.00	700.00	L-15
		Sinking helper (semi-skilled)	day	5.75	164.00	943.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1617.00	9702.00	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay	hour	4.25	784.00	3332.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1303.40	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Overhead charges @ 0.25 on (a+b)				4013.48	
		d) Contractor's profit @ 0.1 on (a+b+c)				2006.74	
		Cost for 0.5m = a+b+c+d				22074.15	
		Rate per metre = (a+b+c+d)/0.50				44148.31	
					<i>say</i>	<b>44148.00</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%	46356.00	48674.00		
		12th m	5%	48674.00	51108.00		
		13th m	5%	51108.00	53663.00		
		14th m	5%	53663.00	56346.00		
		15th m	5%	56346.00	59163.00		
		16th m	5%	59163.00	62121.00		
		17th m	5%	62121.00	65227.00		
		18th m	5%	65227.00	68488.00		
		19th m	5%	68488.00	71912.00		
		20th m	5%	71912.00	75508.00		
		Total Cost from 10m upto 20m		583058.00	612211.00		
		<b>Avg Rate per metre</b>		<b>58306.00</b>	<b>61221.00</b>		
12.17 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%	77305.00	96631.00	101463.00	
		22nd	7.5%	83103.00	103879.00	109073.00	
		23rd m	7.5%	89336.00	111670.00	117254.00	
		24th m	7.5%	96036.00	120045.00	126047.00	
		25th m	7.5%	103239.00	129049.00	135501.00	
		26th m	7.5%	110982.00	138728.00	145664.00	
		27th m	7.5%	119306.00	149133.00	156590.00	
		28th m	7.5%	128254.00	160318.00	168334.00	
		29th m	7.5%	137873.00	172341.00	180958.00	
		30th m	7.5%	148213.00	185266.00	194529.00	
		Total Cost from 20m upto 30m		1093647.00	1367060.00	1435413.00	
		<b>Avg Rate per metre</b>		<b>109365.00</b>	<b>136706.00</b>	<b>143541.00</b>	
12.17 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%	163034.00	195641.00	205423.00	
		32nd	10%	179337.00	215204.00	225964.00	
		33rd m	10%	197271.00	236725.00	248561.00	
		34th m	10%	216998.00	260398.00	273418.00	
		35th m	10%	238698.00	286438.00	300760.00	
		36th m	10%	262568.00	315082.00	330836.00	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		37th m	10%	288825.00	346590.00	363920.00	
		38th m	10%	317708.00	381250.00	400313.00	
		39th m	10%	349479.00	419375.00	440344.00	
		40th m	10%	384427.00	461312.00	484378.00	
		Total Cost from 30m upto 40m		2598345	3118015	3273917	
		<b>Avg Rate per metre</b>		<b>259835.00</b>	<b>311802.00</b>	<b>327392.00</b>	
12.17	C	Soft Rock (11m dia well )					
		<b>Unit = Running Meter.</b>					
		<b>Taking output = 0.50 m</b>					
		Depth in soft rock strata upto 3m					
		Rate of sinking @ 0.06 m/hour					
		a) Labour					
		Mate	day	0.95	171.00	162.45	L-12
		Sinker ( skilled )	day	4.25	200.00	850.00	L-15
		Sinking helper (semi-skilled)	day	18.00	164.00	2952.00	L-14
		Diver	day	1.50	227.00	340.50	L-07
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.00	1617.00	12936.00	P&M-075
		Air compressor with pneumatic breakers	hour	4.50	784.00	3528.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1646.40	
		Add for dewatering @ 5 per cent of cost of (b), if required				905.52	
		c) Overhead charges @ 0.25 on (a+b)				5830.22	
		d) Contractor's profit @ 0.1 on (a+b+c)				2915.11	
		Cost for 0.5m = a+b+c+d				32066.20	
		Rate per metre = (a+b+c+d)/0.50				64132.39	
					<b>say</b>	<b>64132.00</b>	
12.17	D	Hard Rock (11m dia well )					
		<b>Unit = Running Meter.</b>					
		<b>Taking output = 0.50 m</b>					
		Depth in hard rock upto 3 m					
		Rate of sinking @ 0.05 m/hour					
		a) Material					
		Gelatine 80 per cent	Kg	12.00	643.63	7723.50	M-104
		Electric Detonators	each.	48.00	6.00	288.00	M-094/100
		b) Labour					
		Mate	day	1.35	171.00	230.85	L-12
		Driller	day	2.00	190.00	380.00	L-06
		Blaster	day	0.25	264.00	66.00	L-03
		Mazdoor	day	26.00	157.00	4082.00	L-13
		Mazdoor (Skilled)	day	4.00	200.00	800.00	L-15
		c) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	1617.00	16170.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.50	784.00	2744.00	P&M-063
		Dewatering @ 5 per cent of cost (c), if required.				945.70	
		Consumables in sinking @ 10 per cent of cost of (b+c).				2447.29	
		d) Overhead charges @ 0.25 on (a+b+c)				8969.33	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				4484.67	
		Cost for 0.5m = a+b+c+d+e				49331.34	
		Rate per metre = (a+b+c+d+e)/0.50				98662.67	
					<b>say</b>	<b>98663.00</b>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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.					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 0.25 m</i>					
		Diameter of well - 12 m.					
	A	Sandy Soil					
	(i)	I) Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.05 m/hour					
		a) Labour					
		Mate	day	0.22	171.00	37.62	L-12
		Sinker ( skilled )	day	1.75	200.00	350.00	L-15
		Sinking helper (semi-skilled)	day	4.00	164.00	656.00	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.00	1617.00	9702.00	P&M-075
		Consumables in sinking @10 per cent of (b)				970.20	
		c) Overhead charges @ 0.25 on (a+b)				2928.96	
		d) Contractor's profit @ 0.1 on (a+b+c)				1464.48	
		Cost for 0.25m = a+b+c+d				16109.25	
		Rate per metre = (a+b+c+d)/0.25				64437.01	
						<i>say</i> <b>64437.00</b>	
12.18 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.038 m/hour					
		a) Labour					
		Mate	day	0.37	171.00	63.27	L-12
		Sinker	day	2.50	200.00	500.00	L-15
		Sinking helper (semi-skilled)	day	4.75	164.00	779.00	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.50	1617.00	10510.50	P&M-075
		Consumables in sinking @10 per cent of (b)				1051.05	
		c) Overhead charges @ 0.25 on (a+b)				3225.96	
		d) Contractor's profit @ 0.1 on (a+b+c)				1612.98	
		Cost for 0.25m = a+b+c+d				17742.75	
		Rate per metre = (a+b+c+d)/0.25				70971.01	
						<i>say</i> <b>70971.00</b>	
12.18 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%	74520.00			
		12th m	5%	78246.00			
		13th m	5%	82158.00			
		14th m	5%	86266.00			
		15th m	5%	90579.00			
		16th m	5%	95108.00			
		17th m	5%	99863.00			
		18th m	5%	104856.00			
		19th m	5%	110099.00			
		20th m	5%	115604.00			
		Total Cost from 10m upto 20m		937299.00			
		<i>Avg Rate per metre</i>		<b>93730.00</b>			
12.18 A	(iv)	Beyond 20m upto 30 m					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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 20 per cent of cost for Kentledge including supports, loading arrangement and Labour.		(a)	(b) Including 20% for Kentledge		
		21st m	7.5%	124274.00	149129.00		
		22nd m	7.5%	133595.00	160314.00		
		23rd m	7.5%	143615.00	172338.00		
		24th m	7.5%	154386.00	185263.00		
		25th m	7.5%	165965.00	199158.00		
		26th m	7.5%	178412.00	214094.00		
		27th m	7.5%	191793.00	230152.00		
		28th m	7.5%	206177.00	247412.00		
		29th m	7.5%	221640.00	265968.00		
		30th m	7.5%	238263.00	285916.00		
		Total Cost from 20m upto 30m		1758120.00	2109744.00		
		<b>Avg Rate per metre</b>		<b>175812.00</b>	<b>210974.00</b>		
12.18 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%	262089.00	314507.00		
		32nd	10%	288298.00	345958.00		
		33rd m	10%	317128.00	380554.00		
		34th m	10%	348841.00	418609.00		
		35th m	10%	383725.00	460470.00		
		36th m	10%	422098.00	506518.00		
		37th m	10%	464308.00	557170.00		
		38th m	10%	510739.00	612887.00		
		39th m	10%	561813.00	674176.00		
		40th m	10%	617994.00	741593.00		
		Total Cost from 30m upto 40m		4177033	5012442		
		<b>Avg Rate per metre</b>		<b>417703.00</b>	<b>501244.00</b>		
12.18	B	Clayey Soil (12 m dia. Well )					
		<b>Unit = Running Meter.</b>					
		<b>Taking output = 0.25 meter.</b>					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.04 m/hour					
	a)	Labour					
		Mate	day	0.30	171.00	51.30	L-12
		Sinker ( skilled )	day	3.00	200.00	600.00	L-15
		Sinking helper (semi-skilled)	day	4.50	164.00	738.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.25	1617.00	10106.25	P&M-075
		Consumables in sinking @ 10 per cent of (b)				1010.63	
	c)	Overhead charges @ 0.25 on (a+b)				3126.54	
	d)	Contractor's profit @ 0.1 on (a+b+c)				1563.27	
		Cost for 0.25m = a+b+c+d				17195.99	
		Rate per metre = (a+b+c+d)/0.25				68783.96	
						<b>say 68784.00</b>	
12.18 B	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.03 m/hour					
	a)	Labour					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate	day	0.48	171.00	82.08	L-12
		Sinker	day	3.75	200.00	750.00	L-15
		Sinking helper (semi-skilled)	day	6.00	164.00	984.00	L-14
		<b>b) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.33	1617.00	13469.61	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.50	784.00	3528.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1699.76	
		<b>c) Overhead charges @ 0.25 on (a+b)</b>				5128.36	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				2564.18	
		Cost for 0.25m = a+b+c+d				28206.00	
		Rate per metre = (a+b+c+d)/0.25				112823.98	
					<b>say</b>	<b>112824.00</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%	118465.00	124388.00		
		12th m	5%	124388.00	130607.00		
		13th m	5%	130607.00	137137.00		
		14th m	5%	137137.00	143994.00		
		15th m	5%	143994.00	151194.00		
		16th m	5%	151194.00	158754.00		
		17th m	5%	158754.00	166692.00		
		18th m	5%	166692.00	175027.00		
		19th m	5%	175027.00	183778.00		
		20th m	5%	183778.00	192967.00		
		Total Cost from 10m upto 20m		1490036.00	1564538.00		
		<b>Avg Rate per metre</b>		<b>149004.00</b>	<b>156454.00</b>		
12.18 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%	197561.00	246951.00	259299.00	
		22nd	7.5%	212378.00	265473.00	278747.00	
		23rd m	7.5%	228306.00	285383.00	299652.00	
		24th m	7.5%	245429.00	306786.00	322125.00	
		25th m	7.5%	263836.00	329795.00	346285.00	
		26th m	7.5%	283624.00	354530.00	372257.00	
		27th m	7.5%	304896.00	381120.00	400176.00	
		28th m	7.5%	327763.00	409704.00	430189.00	
		29th m	7.5%	352345.00	440431.00	462453.00	
		30th m	7.5%	378771.00	473464.00	497137.00	
		Total Cost from 20m upto 30m		2794909	3493637	3668320	
		<b>Avg Rate per metre</b>		<b>279491.00</b>	<b>349364.00</b>	<b>366832.00</b>	
12.18 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					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
	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%	416648.00	499978.00	524977.00	
		32nd	10%	458313.00	549976.00	577475.00	
		33rd m	10%	504144.00	604973.00	635222.00	
		34th m	10%	554558.00	665470.00	698744.00	
		35th m	10%	610014.00	732017.00	768618.00	
		36th m	10%	671015.00	805218.00	845479.00	
		37th m	10%	738117.00	885740.00	930027.00	
		38th m	10%	811929.00	974315.00	1023031.00	
		39th m	10%	893122.00	1071746.00	1125333.00	
		40th m	10%	982434.00	1178921.00	1237867.00	
		Total Cost from 30m upto 40m		6640294	7968354	8366773	
		<i>Avg Rate per metre</i>		<i>664029.00</i>	<i>796835.00</i>	<i>836677.00</i>	
12.18	C	Soft Rock (12m dia well )					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 0.25 m</i>					
		Depth in soft rock strata upto 3m					
		Rate of sinking @ 0.025 m/hour					
		a) Labour					
		Mate	day	1.06	171.00	181.26	L-12
		Sinker ( skilled )	day	4.50	200.00	900.00	L-15
		Sinking helper (semi-skilled)	day	20.00	164.00	3280.00	L-14
		Diver	day	1.75	227.00	397.25	L-07
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	1617.00	16170.00	P&M-075
		Air compressor with pneumatic chisel attachment for cutting hard clay.	hour	4.75	784.00	3724.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1989.40	
		Add for dewatering @ 5 per cent, if required				1094.17	
		c) Overhead charges @ 0.25 on (a+b)				6934.02	
		d) Contractor's profit @ 0.1 on (a+b+c)				3467.01	
		Cost for 0.25m = a+b+c+d				38137.11	
		Rate per metre = (a+b+c+d)/0.25				152548.44	
						<i>say 152548.00</i>	
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					
		a) Material					
		Gelatine 80 per cent	Kg	14.00	643.63	9010.75	M-104
		Electric detonator	each.	56.00	6.00	336.00	M-094/100
		b) Labour					
		Mate	day	1.44	171.00	246.24	L-12
		Driller	day	2.00	190.00	380.00	L-06
		Blaster	day	0.25	264.00	66.00	L-03
		Mazdoor	day	28.00	157.00	4396.00	L-13
		Mazdoor (Skilled)	day	4.50	200.00	900.00	L-15
		c) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	12.50	1617.00	20212.50	P&M-075



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	4.00	784.00	3136.00	P&M-063
		Dewatering @ 5 per cent, if required.				1167.43	
		Consumables in sinking @ 10 per cent of (c).				2451.59	
		d) Overhead charges @ 0.25 on (a+b+c)				10575.63	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				5287.81	
		Cost for 0.25m = a+b+c+d+e				58165.95	
		Rate per metre = (a+b+c+d+e)/0.25				232663.79	
					<b>say</b>	<b>232664.00</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.					
		<b>Unit = Running Meter</b>					
		<b>Taking output = 1 m</b>					
		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					
		a) Labour					
		Mate	day	0.20	171.00	34.20	L-12
		Sinker (skilled)	day	1.25	200.00	250.00	L-15
		Sinking helper (semi-skilled)	day	3.75	164.00	615.00	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.50	1617.00	8893.50	P&M-075
		Consumables in sinking @10 per cent of (b)				889.35	
		c) Overhead charges @ 0.25 on (a+b)				2670.51	
		d) Contractor's profit @ 0.1 on (a+b+c)				1335.26	
		Rate per metre = (a+b+c+d)				14687.82	
					<b>say</b>	<b>14688.00</b>	
12.19 A	(ii)	Beyond 3m upto 10m depth					
		Rate of sinking @ 0.17 m/hour					
		a) Labour					
		Mate	day	0.30	171.00	51.30	L-12
		Sinker	day	1.50	200.00	300.00	L-15
		Sinking helper (semi-skilled)	day	4.00	164.00	656.00	L-14
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	5.88	1617.00	9507.96	P&M-075
		Consumables in sinking @10 per cent of (b)				950.80	
		c) Overhead charges @ 0.25 on (a+b)				2866.51	
		d) Contractor's profit @ 0.1 on (a+b+c)				1433.26	
		Rate per metre = (a+b+c+d)				15765.83	
					<b>say</b>	<b>15766.00</b>	
12.19 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%	16554.00			
		12th m	5%	17382.00			
		13th m	5%	18251.00			
		14th m	5%	19164.00			

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		15th m	5%	20122.00			
		16th m	5%	21128.00			
		17th m	5%	22184.00			
		18th m	5%	23293.00			
		19th m	5%	24458.00			
		20th m	5%	25681.00			
		Total Cost from 10m upto 20m		208217.00			
		<b>Avg Rate per metre</b>		<b>20822.00</b>			
12.19 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%	27607.00	33128.00		
		22nd m	7.5%	29678.00	35614.00		
		23rd m	7.5%	31904.00	38285.00		
		24th m	7.5%	34297.00	41156.00		
		25th m	7.5%	36869.00	44243.00		
		26th m	7.5%	39634.00	47561.00		
		27th m	7.5%	42607.00	51128.00		
		28th m	7.5%	45803.00	54964.00		
		29th m	7.5%	49238.00	59086.00		
		30th m	7.5%	52931.00	63517.00		
		Total Cost from 20m upto 30m		390568.00	468682.00		
		<b>Avg Rate per metre</b>		<b>39057.00</b>	<b>46868.00</b>		
12.19 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%	58224.00	69869.00		
		32nd	10%	64046.00	76855.00		
		33rd m	10%	70451.00	84541.00		
		34th m	10%	77496.00	92995.00		
		35th m	10%	85246.00	102295.00		
		36th m	10%	93771.00	112525.00		
		37th m	10%	103148.00	123778.00		
		38th m	10%	113463.00	136156.00		
		39th m	10%	124809.00	149771.00		
		40th m	10%	137290.00	164748.00		
		Total Cost from 30m upto 40m		927944.00	1113533.00		
		<b>Avg Rate per metre</b>		<b>92794.00</b>	<b>111353.00</b>		
12.19	B	Clayey Soil (Twin D Type Well)					
		<b>Unit = Running Meter</b>					
		<b>Taking output = 1 meter</b>					
	(i)	Depth below bed level upto 3.0 M					
		Rate of sinking @ 0.16 m/hour					
	a)	Labour					
		Mate	day	0.26	171.00	44.46	L-12
		Sinker ( skilled )	day	2.50	200.00	500.00	L-15
		Sinking helper (semi-skilled)	day	4.00	164.00	656.00	L-14
	b)	Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	6.25	1617.00	10106.25	P&M-075



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		30th m	7.5%	80581.00	100726.00	105762.00	
		Total Cost from 20m upto 30m		594594.00	743242.00	780404.00	
		<i>Avg Rate per metre</i>		<i>59459.00</i>	<i>74324.00</i>	<i>78040.00</i>	
12.19 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%	88639.00	106367.00	111685.00	
		32nd	10%	97503.00	117004.00	122854.00	
		33rd m	10%	107253.00	128704.00	135139.00	
		34th m	10%	117978.00	141574.00	148653.00	
		35th m	10%	129776.00	155731.00	163518.00	
		36th m	10%	142754.00	171305.00	179870.00	
		37th m	10%	157029.00	188435.00	197857.00	
		38th m	10%	172732.00	207278.00	217642.00	
		39th m	10%	190005.00	228006.00	239406.00	
		40th m	10%	209006.00	250807.00	263347.00	
		Total Cost from 30m upto 40m		1412675.00	1695211.00	1779971.00	
		<i>Avg Rate per metre</i>		<i>141268.00</i>	<i>169521.00</i>	<i>177997.00</i>	
12.19	C	Soft Rock (Twin D Type Well )					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 1 m</i>					
		Depth in soft rock strata upto 3m					
		Rate of sinking @ 0.12 m/hour					
		a) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Sinker ( skilled )	day	4.50	200.00	900.00	L-15
		Sinking helper (semi-skilled)	day	15.00	164.00	2460.00	L-14
		Diver	day	1.50	227.00	340.50	L-07
		b) Machinery					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	8.33	1617.00	13469.61	P&M-075
		Air compressor with pneumatic breakers	hour	6.00	784.00	4704.00	P&M-063
		Consumables in sinking @ 10 per cent of (b)				1817.36	
		Add for dewatering @ 5 per cent, if required				999.55	
		c) Overhead charges @ 0.25 on (a+b)				6209.52	
		d) Contractor's profit @ 0.1 on (a+b+c)				3104.76	
		Rate per metre = (a+b+c+d)				34152.36	
						<i>say 34152.00</i>	
12.19	D	Hard Rock (Twin D Type Well )					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 1 m</i>					
		Depth in hard rock strata upto 3 m					
		Rate of sinking @ 0.10 m/hour					
		a) Material					
		Geeltine80 per cent	Kg	10.00	643.63	6436.25	M-104
		Electric detonators	each.	40.00	6.00	240.00	M-094/100
		b) Labour					
		Mate	day	1.34	171.00	229.14	L-12
		Driller	day	2.00	190.00	380.00	L-06
		Blaster	day	0.25	264.00	66.00	L-03

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor	day	25.00	157.00	3925.00	L-13
		Mazdoor (Skilled)	day	4.25	200.00	850.00	L-15
		<b>c) Machinery</b>					
		Hire & running charges of crane with grab bucket of 0.75 cum capacity and accessories.	hour	10.00	1617.00	16170.00	P&M-075
		Hire & running charges of compressor with pneumatic breaker/Jack hammer or drill	hour	3.00	784.00	2352.00	P&M-063
		Dewatering @ 5 per cent of cost of (b+c), if required.				1198.61	
		Consumables in sinking @ 10 per cent of (c).				1972.06	
		<b>d) Overhead charges @ 0.25 on (a+b+c)</b>				8454.76	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				4227.38	
		<b>Rate per metre = (a+b+c+d+e)</b>				46501.20	
					<i>say</i>	<b>46501.00</b>	
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.					
		<i>Unit - 1 cum</i>					
		<i>Taking output = 5 cum</i>					
		<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	5058.00	40464.00	Item 12.8 (H)
		HYSB bar reinforcement in corbel	tonne	0.48	42812.50	20550.00	M-082
		<b>Blasting material</b>					
		Gelatine 80 per cent	Kg	1.50	643.63	965.44	M-104
		Electric detonators	each	6.00	6.00	36.00	M-094/100
		<b>b) Labour</b>					
		Medical Officer	day	0.50	626.06	313.03	L-16
		Para medical personnel	day	1.00	312.00	312.00	L-19
		Mate	day	1.86	171.00	318.06	L-12
		Driller	day	1.00	190.00	190.00	L-06
		Blaster	day	0.50	264.00	132.00	L-03
		Mazdoor (for cutting, blasting, cleaning, removal of Material etc.)	day	30.00	157.00	4710.00	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	200.00	2000.00	L-15
		Diver	day	4.00	227.00	908.00	L-07
		<b>c) Machinery</b>					
		(i) Induction, deinduction and erection of plant and equipment including all components and accessories for pneumatic method of well sinking.	hour	6.00	input	#VALUE!	P&M-082
		Induction and deinduction	L.S			100000.00	
		Erection at site and commissioning	L.S			150000.00	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Usage of plant and equipment for pneumatic method of well sinking	hour	6.00	5273.00	31638.00	P&M-038
		Air compressor 250 cfm, 2 nos.	hour	2 x 6	405.00	4860.00	P&M-001
		Hire and running charges of crane of 15 tonne capacity	hour	6.00	1079.00	6474.00	P&M-072
		Motorised barge of 20 tonne capacity	hour	6.00	196.00	1176.00	P&M-066
		Boat to carry atleast 20 persons	hour	6.00	196.00	1176.00	P&M-066
		Electric generating set 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		Tipper 10 tonne capacity	hour	6.00	787.00	4722.00	P&M-048
		d) Overhead charges @ 0.25 on (a+b+c)				#VALUE!	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				#VALUE!	
		Cost for 5 cum = a+b+c+d+e (see notes below)				#VALUE!	
		Rate per cum = (a+b+c+d+e)/5				#VALUE!	
	Note	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	Sand Filling in Wells complete as per Drawing and Technical Specifications.					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Sand (assuming 20 per cent voids )	cum	1.20	113.71	136.45	M-006
		b) Labour					
		Mate	day	0.01	171.00	1.71	L-12
		Mazdoor	day	0.30	157.00	47.10	L-13
		c) Overhead charges @ 0.25 on (a+b)				46.32	
		d) Contractor's profit @ 0.1 on (a+b+c)				23.16	
		Rate per cum (a+b+c+d)				254.74	
						<i>say</i>	<i>255.00</i>
12.22	1200 & 1900	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.					
		<i>Unit = 1 MT</i>					
		<i>Taking output = 1 MT</i>					
		a) Material					
		i) Structural steel including 5 per cent wastage	tonne	1.05	44879.36	47123.33	M-179
		b) Labour					
		Mate	day	1.24	171.00	212.04	L-12
		Fitter	day	6.00	216.00	1296.00	L-08
		Blacksmith	day	5.00	190.00	950.00	L-01
		Welder	day	5.00	239.00	1195.00	L-02b

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		Mazdoor	day	10.00	157.00	1570.00	L-13	
		Electrodes, cutting gas and other consumables @ 5 per cent on cost a (a) above.				2356.17		
		c) Overhead charges @ 0.25 on (a+b)				13675.63		
		d) Contractor's profit @ 0.1 on (a+b+c)				6837.82		
		Rate for per MT (a+b+c+d)				75215.98		
					<i>say</i>	<b>75216.00</b>		
12.23	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-750 mm						
		<i>Unit = meter</i>						
		<i>Taking output = 15 m</i>						
		a) Materials						
	added	Case I	PCC Grade M35 (with using Concrete Mixer)	cum	6.62	5241.00	34695.42	Item 12.11 (C) iv case-I
		Case II	PCC Grade M35 (With using Batching Plant)	cum	6.62	5049.00	33424.38	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	6909.00	41454.00	P&M-036	
		Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	452.00	226.00	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	1071.00	321.30	P&M-017	
		Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.30	787.00	236.10	P&M-048	
		Bentonite	kg	300.00	3.17	951.30	M-071	
		c) Labour						
		Mate/Supervisor	day	0.14	171.00	23.94	L-12	
		Mazdoor	day	3.50	157.00	549.50	L-13	
		d) Overhead charges @ 0.25 on (b+c)				10940.54		
		e) Contractor's profit @ 0.1 on (b+c+d)				5470.27		
		Cost for 15 m = a+b+c+d+d+e				93597.32		
		Rate per metre (a+b+c+d+e)/15				6239.82		
		A) Rate with using Concrete Mixer					<b>6325.00</b>	
		B) Rate with using Batching Plant					<b>6240.00</b>	
12.24	1100,1600 & 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-1000 mm						
		<i>Unit = meter</i>						
		<i>Taking output = 10 m</i>						
		a) Materials						
	added	Case I	PCC Grade M35 (with using Concrete Mixer)	cum	7.85	5241.00	41141.85	Item 12.11 (C) iv case-I
		Case II	PCC Grade M35 (With using Batching Plant)	cum	7.85	5049.00	39634.65	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 )						

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.	
		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	6909.00	41454.00	P&M-036	
		Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	452.00	226.00	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	1071.00	428.40	P&M-017	
		Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.40	787.00	314.80	P&M-048	
		Bentonite	kg	350.00	3.17	1109.85	M-071	
		<b>c) Labour</b>						
		Mate/Supervisor	day	0.16	171.00	27.36	L-12	
		Mazdoor	day	4.00	157.00	628.00	L-13	
		<b>d) Overhead charges @ 0.25 on (b+c)</b>				11047.10		
		<b>e) Contractor's profit @ 0.1 on (b+c+d)</b>				5523.55		
		Cost for 10 m = a+b+c+d+d+e				100393.71		
		Rate per metre (a+b+c+d+e)/10				10039.37		
					<i>say</i>	<b>10039.00</b>		
		A) Rate with using Concrete Mixer				<b>10190.00</b>		
		B) Rate with using Batching Plant				<b>10039.00</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						
		<i>Unit = meter</i>						
		<i>Taking output = 9 m</i>						
		<b>a) Materials</b>						
	added	Case I	PCC Grade M35 (with using Concrete Mixer)	cum	10.17	5241.00	53300.97	Item 12.11 (C) iv case-I
		Case II	PCC Grade M35 (With using Batching Plant)	cum	10.17	5049.00	51348.33	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	6909.00	41454.00	P&M-036	
		Hire and running charges of light crane for lowering reinforcement cage	hour	0.50	452.00	226.00	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	1071.00	535.50	P&M-017	
		Tipper 5.5 cum capacity for disposal of muck from pile bore hole	hour	0.50	787.00	393.50	P&M-048	
		Bentonite	kg	385.00	3.17	1220.84	M-071	
		<b>c) Labour</b>						
		Mate/Supervisor	day	0.18	171.00	30.78	L-12	
		Mazdoor	day	4.50	157.00	706.50	L-13	
		<b>d) Overhead charges @ 0.25 on (b+c)</b>				11141.78		
		<b>e) Contractor's profit @ 0.1 on (b+c+d)</b>				5570.89		
		Cost for 9 m = a+b+c+d+d+e				112628.11		
		Rate per metre (a+b+c+d+e)/9				12514.23		
					<i>say</i>	<b>12514.00</b>		
		A) Rate with using Concrete Mixer				<b>12731.00</b>		
		B) Rate with using Batching Plant				<b>12514.00</b>		



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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					
		<i>Unit = Running meter</i>					
		<i>Taking output = 40 metre</i>					
		a) Materials					
	added	Case I PCC Grade M35 (with using Concrete Mixer)	cum	17.66	5241.00	92556.06	Item 12.11 (C) iv case-I
		Case II PCC Grade M35 (With using Batching Plant)	cum	17.66	5049.00	89165.34	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	47.06	7529.60	M-080
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	58.05	4063.50	M-124
		iii) Steel helmet and cushion block on top of casing head during driving	Kg	50.00	39.52	1975.80	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	6909.00	41454.00	P&M-085
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	1079.00	539.50	P&M-070
		d) Labour					
		Mate/Supervisor	day	0.12	171.00	20.52	L-12
		Mazdoor	day	3.00	157.00	471.00	L-13
		e) Overhead charges @ 0.25 on (b+c+d)				14013.48	
		f) Contractor's profit @ 0.1 on (b+c+d+e)				7006.74	
		Cost for 40 m = a+b+c+d+e				166239.48	
		Rate per metre (a+b+c+d+e)/40				4155.99	
					<i>say</i>	<b>4156.00</b>	
		A) Rate with using Concrete Mixer				<b>4241.00</b>	
		B) Rate with using Batching Plant				<b>4156.00</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.					
12.27	1100 & 1700	Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile diameter - 1000 mm					
		<i>Unit = Running meter</i>					
		<i>Taking output = 30 metre</i>					
		a) Materials					
	added	Case I PCC Grade M35 (with using Concrete Mixer)	cum	23.55	5241.00	123425.55	Item 12.11 (C) iv case-I
		Case II PCC Grade M35 (With using Batching Plant)	cum	23.55	5049.00	118903.95	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	47.06	7529.60	M-080
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	58.05	4063.50	M-124

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		iii) Steel helmet and cushion block on top of casing head during driving	Kg	50.00	39.52	1975.80	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	6909.00	41454.00	P&M-085
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	1079.00	539.50	P&M-070
		Hire and running charges for light crane for lowering reinforcement cage.	hour	0.50	452.00	226.00	P&M-013
		<b>d) Labour</b>					
		Mate/Supervisor	day	0.16	171.00	27.36	L-12
		Mazdoor	day	4.00	157.00	628.00	L-13
		<b>e) Overhead charges @ 0.25 on (b+c+d)</b>				14110.94	
		<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				7055.47	
		Cost for 30 m = a+b+c+d+e				196514.12	
		<b>Rate per metre (a+b+c+d+e)/30</b>				6550.47	
					<i>say</i>	<b>6550.00</b>	
		<b>A) Rate with using Concrete Mixer</b>				<b>6701.00</b>	
		<b>B) Rate with using Batching Plant</b>				<b>6550.00</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.					
12.28	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					
		<i>Unit = Running meter</i>					
		<i>Taking output = 20 metre</i>					
		<b>a) Materials</b>					
	added	Case I PCC Grade M35 (with using Concrete Mixer)	cum	22.61	5241.00	118499.01	Item 12.11 (C) iv case-I
		Case II PCC Grade M35 (With using Batching Plant)	cum	22.61	5049.00	114157.89	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>b) Materials Pile shoes</b>					
		i) C.I. shoes for the pile	Kg	160.00	47.06	7529.60	M-080
		ii) M.S. clamps for shoe @ 35 Kg per pile of 15 m	Kg	70.00	58.05	4063.50	M-124
		iii) Steel helmet on top of casing head during driving	Kg	50.00	39.52	1975.80	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	6909.00	41454.00	P&M-085
		Hiring and running charges for light crane 5 tonnes lifting capacity for lowering reinforcement and handling steel casing.	hour	0.50	1079.00	539.50	P&M-070
		<b>d) Labour</b>					
		Mate/Supervisor	day	0.18	171.00	30.78	L-12
		Mazdoor	day	4.50	157.00	706.50	L-13
		<b>e) Overhead charges @ 0.25 on (b+c+d)</b>				14074.92	
		<b>f) Contractor's profit @ 0.1 on (b+c+d+e)</b>				7037.46	
		Cost for 20 m = a+b+c+d+e				191569.95	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per metre (a+b+c+d+e)/20				9578.50	
					<i>say</i>	<b>9578.00</b>	
		A) Rate with using Concrete Mixer				<b>9795.00</b>	
		B) Rate with using Batching Plant				<b>9578.00</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.					
12.29	1100 & 1700	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile Diameter = 500 mm					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 60 m</i>					
		a) Materials					
		RCC Grade M35	cum	11.78	4699.00	55354.22	Item 12.11 (F) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( F ) (IV)					
		b) Material Pile shoes					
		a) C.I Shoes	Kg	240.00	47.06	11294.40	M-080
		b) M.S. shoes	Kg	105.00	22.20	2331.00	M-125
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	39.52	1185.48	M-173
		c) Machinery					
		Crane 20 t capacity	hour	6.00	1079.00	6474.00	P&M-073
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
		d) Labour					
		Mate/Supervisor	day	0.12	171.00	20.52	L-12
		Mazdoor	day	3.00	157.00	471.00	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!	
		e) Overhead charges @ 0.25 on (b+c+d)				#VALUE!	
		f) Contractor's profit @ 0.1 on (b+c+d+e)				#VALUE!	
		Cost for 60 m = a+b+c+d+e+f				#VALUE!	
		Rate per metre (a+b+c+d+e+f)/60				#VALUE!	
					<i>say</i>	<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	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile Diameter = 750 mm					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 50 m</i>					
		a) Materials					
		RCC Grade M35	cum	22.08	4699.00	103753.92	Item 12.11 (F) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( F ) (IV)					
		b) Material Pile shoes					
		a) C.I. shoes	Kg	160.00	47.06	7529.60	M-080

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		b) M.S. shoes	Kg	70.00	22.20	1554.00	M-125
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	40.00	39.52	1580.64	M-173
		c) Machinery					
		Crane 40 T capacity	hour	6.00	1617.00	9702.00	P&M-074
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
		d) Labour					
		Mate/Supervisor	day	0.16	171.00	27.36	L-12
		Mazdoor	day	4.00	157.00	628.00	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!	
		e) Overhead charges @ 0.25 on (b+c+d)				#VALUE!	
		f) Contractor's profit @ 0.1 on (b+c+d+e)				#VALUE!	
		Cost for 50 m = a+b+c+d+e+f				#VALUE!	
		Rate per metre (a+b+c+d+e+f)/50				#VALUE!	
					<i>say</i>	#VALUE!	
		<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	Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and & Technical Specification					
		Pile Diameter = 1000 mm					
		<i>Unit = Running Meter</i>					
		a) Materials					
		RCC Grade M35	cum	31.40	4699.00	147548.60	Item 12.11 (F) iv
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11 (F) (IV)					
		b) Material Pile shoes					
		a) C.I. shoes for the pile	Kg	160.00	47.06	7529.60	M-080
		b) M.S. shoes @ 35 Kg per pile of 15 m	Kg	70.00	22.20	1554.00	M-125
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	50.00	39.52	1975.80	M-173
		c) Machinery					
		Crane 80 t capacity.	hour	6.00	1617.00	9702.00	P&M-011
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
		d) Labour					
		Mate/Supervisor	day	0.20	171.00	34.20	L-12
		Mazdoor	day	5.00	157.00	785.00	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!	
		e) Overhead charges @ 0.25 on (b+c+d)				#VALUE!	
		f) Contractor's profit @ 0.1 on (b+c+d+e)				#VALUE!	
		Cost for 40 m = a+b+c+d+e+f				#VALUE!	
		Rate per metre (a+b+c+d+e+f)/40				#VALUE!	
					<i>say</i>	#VALUE!	
		<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	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					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		<i>Unit = Running Meter</i>					
		<i>Taking output = 60 m</i>					
		a) Materials					
		RCC Grade M-35					
		Rate for concrete may be adopted same as for bottom plug vide item no. 12.11( F ) (IV)	cum	5.40	4699.00	25374.60	Item 12.11 (F) iv
		b) Material Pile shoes					
		a) C I shoes	kg	240.00	47.06	11294.40	M-080
		b) M. S shoes	kg	105.00	22.20	2331.00	M-125
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	39.52	1185.48	M-173
		c) Machinery					
		Crane 10 tonne capacity	hour	6.00	1079.00	6474.00	P&M-071
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
		d) Labour					
		Mate/Supervisor	day	0.12	171.00	20.52	L-12
		Mazdoor	day	3.00	157.00	471.00	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!	
		e) Overhead charges @ 0.25 on (b+c+d)				#VALUE!	
		f) Contractor's profit @ 0.1 on (b+c+d+e)				#VALUE!	
		Cost for 60 m = a+b+c+d+e+f				#VALUE!	
		Rate per metre (a+b+c+d+e+f)/60				#VALUE!	
					<i>say</i>	<i>#VALUE!</i>	
		Note					
		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	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					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 50 m</i>					
		a) Materials					
		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	4699.00	58737.50	Item 12.11 (F) iv
		b) Material Pile shoes					
		a) C I shoes	kg	160.00	47.06	7529.60	M-080
		b) M. S shoes	kg	70.00	22.20	1554.00	M-125
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	39.52	1185.48	M-173
		c) Machinery					
		Crane 20 tonne capacity	hour	6.00	1079.00	6474.00	P&M-073
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
		d) Labour					
		Mate/Supervisor	day	0.16	171.00	27.36	L-12
		Mazdoor	day	4.00	157.00	628.00	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!	
		e) Overhead charges @ 0.25 on (b+c+d)				#VALUE!	
		f) Contractor's profit @ 0.1 on (b+c+d+e)				#VALUE!	
		Cost for 50 m = a+b+c+d+e+f				#VALUE!	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per metre (a+b+c+d+e+f)/50				#VALUE!	
					<i>say</i>	<del>#VALUE!</del>	
		<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.					
12.34	1100 & 1700	<b>Driven precast vertical M35 grade R.C.C. Piles excluding Reinforcement complete as per Drawing and &amp; Technical Specification</b>					
		Size of pile - 750 mm x 750 mm					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 40 m</i>					
		<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	4699.00	105727.50	Item 12.11 (F) iv
		<b>b) Material</b>					
		Pile shoes					
		a) C I shoes	kg	160.00	47.06	7529.60	M-080
		b) M. S shoes	kg	70.00	22.20	1554.00	M-125
		c) Steel helmet and cushion block on top of pile head during driving.	Kg	30.00	39.52	1185.48	M-173
		<b>c) Machinery</b>					
		Crane 20 tonne capacity	hour	6.00	1079.00	6474.00	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	171.00	30.78	L-12
		Mazdoor	day	4.50	157.00	706.50	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 @ 0.25 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!	
		Rate per metre (a+b+c+d+e+f)/40				#VALUE!	
					<i>say</i>	<del>#VALUE!</del>	
		<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)					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 70 m</i>					
		<b>a) Materials</b>					
		Structural steel including 5 per cent wastage @ 82.20 kg/m	tonnes	6.04	44879.36	271071.33	M-179
		<b>b) Machinery</b>					
		Crane 10 T capacity	hour	6.00	1079.00	6474.00	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	171.00	20.52	L-12
		Mazdoor	day	3.00	157.00	471.00	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!	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Overhead charges @ 0.25 on (a+b+c)				#VALUE!	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				#VALUE!	
		Cost for 70 m = a+b+c+d+e				#VALUE!	
		Rate per metre (a+b+c+d+e)/70				#VALUE!	
					<i>say</i>	#VALUE!	
12.36	1100 &1900	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)					
		<i>Unit = Running Meter</i>					
		<i>Taking output = 60 m</i>					
		a) Materials					
		Structural steel including 5 per cent wastage @92.50 kg/m	tonnes	5.83	44879.36	261646.67	M-179
		b) Machinery					
		Crane 10 T capacity	hour	6.00	1079.00	6474.00	P&M-071
		Vibrating Pile driving hammer complete with power unit and accessories.	hour	6.00	input	#VALUE!	P&M-092
		c) Labour					
		Mate/Supervisor	day	0.14	171.00	23.94	L-12
		Mazdoor	day	3.50	157.00	549.50	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!	
		d) Overhead charges @ 0.25 on (a+b+c)				#VALUE!	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				#VALUE!	
		Cost for 60 m = a+b+c+d+e				#VALUE!	
		Rate per metre (a+b+c+d+e)/60				#VALUE!	
					<i>say</i>	#VALUE!	
12.37	1100	Pile Load Test on single Vertical Pile in accordance with IS:2911(Part-IV)					
		<i>Unit = 1 MT</i>					
		<i>Taking output = 1 MT</i>					
		a) Initial and routine load test	tonne	1.00	300.00		
		b) Lateral load test	tonne	1.00	5000.00		
		Note				VALUE	
		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.					
12.38	1100, 1500 &1700	Cement Concrete for Reinforced Concrete in Pile Cap complete as per Drawing and Technical Specification					
		A					
		RCC Grade M20					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		(i) Using Concrete Mixer					
		a) Material					
		Cement	tonne	5.12	5462.00	27965.44	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.90	171.00	153.90	L-12
		Mason	day	1.50	190.00	285.00	L-10
		Mazdoor for concreting	day	20.00	157.00	3140.00	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	157.00	157.00	L-13

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator (capacity 33 KVA)	hour	6.00	470.00	2820.00	P&M-079
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1729.79	
		d) Overhead charges @ 0.25 on (a+b+c)				11243.63	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				5621.82	
		Cost for 15 cum = a+b+c+d+e				61839.98	
		Rate per metre (a+b+c+d+e)/15				4122.67	
					<i>say</i>	<b>4123.00</b>	
12.38A	(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
		a) Material					
		Cement	tonne	5.12	5462.00	27965.44	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-004
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.16	171.00	27.36	L-12
		Mason	day	0.38	190.00	72.20	L-10
		Mazdoor for concreting	day	2.50	157.00	392.50	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	157.00	157.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	0.75	2325.00	1743.75	P&M-002
		Generator 100 KVA	hour	0.75	1532.00	1149.00	P&M-080
		Loader (capacity 1 cum)	hour	0.75	1071.00	803.25	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Lead upto 1 Km	hour	2.00	1176.00	2352.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	6.00	225.00	Lead =1 km & P&M-050
		Concrete Pump	hour	0.75	323.00	242.25	P&M-007
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1740.21	
		d) Overhead charges @ 0.25 on (a+b+c)				11311.34	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				5655.67	
		Cost for 15 cum = a+b+c+d+e				62212.36	
		Rate per metre (a+b+c+d+e)/15				4147.49	
					<i>say</i>	<b>4147.00</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					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
	(i)	Using Concrete Mixer					
		a) Material					
		Cement	tonne	5.99	5462.00	32717.38	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.90	171.00	153.90	L-12
		Mason	day	1.50	190.00	285.00	L-10
		Mazdoor for concreting	day	20.00	157.00	3140.00	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	157.00	157.00	L-13



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator (capacity 33 KVA)	hour	6.00	470.00	2820.00	P&M-079
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1919.87	
		d) Overhead charges @ 0.25 on (a+b+c)				12479.14	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6239.57	
		Cost for 15 cum = a+b+c+d+e				68635.25	
		Rate per metre (a+b+c+d+e)/15				4575.68	
					<i>say</i>	<u>4576.00</u>	
12.38B	(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
		a) Material					
		Cement	tonne	5.99	5462.00	32717.38	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-004
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.16	171.00	27.36	L-12
		Mason	day	0.38	190.00	72.20	L-10
		Mazdoor for concreting	day	2.50	157.00	392.50	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	157.00	157.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	0.75	2325.00	1743.75	P&M-002
		Generator 125 KVA	hour	0.75	2062.00	1546.50	P&M-018
		Loader (capacity 1 cum)	hour	0.75	1071.00	803.25	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Lead upto 1 Km	hour	2.00	1176.00	2352.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	6.00	225.00	Lead =1 km & P&M-050
		Concrete Pump	hour	0.75	323.00	242.25	P&M-007
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1946.18	
		d) Overhead charges @ 0.25 on (a+b+c)				12650.19	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6325.10	
		Cost for 15 cum = a+b+c+d+e				69576.06	
		Rate per metre (a+b+c+d+e)/15				4638.40	
					<i>say</i>	<u>4638.00</u>	
	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					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
	(i)	Using Concrete Mixer					
		a) Material					
		Cement	tonne	6.10	5462.00	33318.20	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.90	171.00	153.90	L-12
		Mason	day	1.50	190.00	285.00	L-10
		Mazdoor for concreting	day	20.00	157.00	3140.00	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	157.00	157.00	L-13

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator (capacity 33 KVA)	hour	6.00	470.00	2820.00	P&M-079
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1943.90	
		d) Overhead charges @ 0.25 on (a+b+c)				12635.35	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6317.68	
		Cost for 15 cum = a+b+c+d+e				69494.43	
		Rate per metre (a+b+c+d+e)/15				4632.96	
					<i>say</i>	<b>4633.00</b>	
'12.38C	(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
		a) Material					
		Cement	tonne	6.10	5462.00	33318.20	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-004
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.16	171.00	27.36	L-12
		Mason	day	0.38	190.00	72.20	L-10
		Mazdoor for concreting	day	2.50	157.00	392.50	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	157.00	157.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	0.75	2325.00	1743.75	P&M-002
		Generator 100 KVA	hour	0.75	1532.00	1149.00	P&M-080
		Loader (capacity 1 cum)	hour	0.75	1071.00	803.25	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Lead upto 1 Km	hour	2.00	1176.00	2352.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	6.00	225.00	Lead =1 km & P&M-050
		Concrete Pump	hour	0.75	323.00	242.25	P&M-007
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1954.32	
		d) Overhead charges @ 0.25 on (a+b+c)				12703.06	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6351.53	
		Cost for 15 cum = a+b+c+d+e				69866.81	
		Rate per metre (a+b+c+d+e)/15				4657.79	
					<i>say</i>	<b>4658.00</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					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
	(i)	Using Concrete Mixer					
		a) Material					
		Cement	tonne	6.33	5462.00	34574.46	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.90	171.00	153.90	L-12
		Mason	day	1.50	190.00	285.00	L-10
		Mazdoor	day	20.00	157.00	3140.00	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	157.00	157.00	L-13

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator (capacity 33 KVA)	hour	6.00	470.00	2820.00	P&M-079
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				1994.15	
		d) Overhead charges @ 0.25 on (a+b+c)				12961.98	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6480.99	
		Cost for 15 cum = a+b+c+d+e				71290.88	
		Rate per metre (a+b+c+d+e)/15				4752.73	
					<i>say</i>	<b>4753.00</b>	
'12.38D	(ii)	Using Batching Plant, Transit Mixer and Concrete Pump					
		a) Material					
		Cement	tonne	6.33	5462.00	34574.46	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-004
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.16	171.00	27.36	L-12
		Mason	day	0.38	190.00	72.20	L-10
		Mazdoor for concreting	day	2.50	157.00	392.50	L-13
		Mazdoor for breaking pile head, bending bars, cleaning etc.	day	1.00	157.00	157.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	0.75	2325.00	1743.75	P&M-002
		Generator 125 KVA	hour	0.75	2062.00	1546.50	P&M-018
		Loader (capacity 1 cum)	hour	0.75	1071.00	803.25	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Lead upto 1 Km	hour	2.00	1176.00	2352.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	37.5L	6.00	225.00	Lead =1 km & P&M-050
		Concrete Pump	hour	0.75	323.00	242.25	P&M-007
		Formwork @ 4 per cent on cost of concrete i.e. cost of a) Material, b) Labour and c) Machinery				2020.47	
		d) Overhead charges @ 0.25 on (a+b+c)				13133.03	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				6566.52	
		Cost for 15 cum = a+b+c+d+e				72231.69	
		Rate per metre (a+b+c+d+e)/15				4815.45	
					<i>say</i>	<b>4815.00</b>	
12.39	1100&1700	Levelling Course for Pile cap					
		Providing and laying of PCC M15 levelling course 100mm thick below the pile cap.					
		<i>Unit = cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	4.13	5462.00	22558.06	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		40 mm aggregate	cum	8.10	425.02	3442.66	M-055
		20 mm Aggregate	cum	4.05	529.62	2144.96	M-053
		10 mm Aggregate	cum	1.35	589.97	796.46	M-051
		b) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	190.00	285.00	L-10
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		d) Overhead charges @ 0.25 on (a+b+c)				9145.46	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				4572.73	
		Cost for 15 cum = a+b+c+d+e				50300.03	
		Rate per metre (a+b+c+d+e)/15				3353.34	
					<i>say</i>	<b>3353.00</b>	
12.40	1600	Supplying, Fitting and Placing un-coated HYSD bar Reinforcement in Foundation complete as per Drawing and Technical Specifications.					
		<i>Unit = 1 MT</i>					
		<i>Taking output = 1 MT</i>					
		a) Material					
		HYSD bars including 5 per cent overlaps and wastage	tonne	1.05	42812.50	44953.13	M-082
		Binding wire	Kg	6.00	53.85	323.10	M-072
		b) Labour for cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.40	171.00	68.40	L-12
		Blacksmith	day	2.00	213.00	426.00	L-02a
		Mazdoor	day	6.00	157.00	942.00	L-13
		c) Overhead charges @ 0.25 on (a+b)				11678.16	
		d) Contractor's profit @ 0.1 on (a+b+c)				5839.08	
		Rate per MT (a+b+c+d)				64229.86	
					<i>say</i>	<b>64230.00</b>	
12.41	1600	Supplying, fitting and placing un-coated Mild steel reinforcement complete in foundation as per drawing and technical specification					
		<i>Unit = 1 MT</i>					
		<i>Taking output = 1 MT</i>					
		a) Material					
		MS bars including 5 per cent overlaps and wastage	tonne	1.05	43971.42	46169.99	M-126
		Binding wire	Kg	6.00	53.85	323.10	M-072
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.43	171.00	73.53	L-12
		Blacksmith	day	2.25	213.00	479.25	L-02a
		Mazdoor	day	6.50	157.00	1020.50	L-13
		c) Overhead charges @ 0.25 on (a+b)				12016.59	
		d) Contractor's profit @ 0.1 on (a+b+c)				6008.30	
		Rate for per MT (a+b+c+d)				66091.26	
					<i>say</i>	<b>66091.00</b>	

## 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.

## Summary of Rate Analysis

### CHAPTER-13 SUB-STRUCTURE

Item No.	Descriptions	Unit	Rate (in Rs.)
13.1	Brick masonry work in 1:3 in sub-structure complete excluding pointing and plastering, as per drawing and technical specifications	cum	5576.00
13.2	Pointing with cement mortar (1:3 ) on brick work in substructure as per Technical specifications	10 sqm	391.00
13.3	Plastering with cement mortar (1:3 ) on brick work in sub-structure as per Technical specifications	10 sqm	872.00
13.4	Stone masonry work in cement mortar 1:3 for substructure complete as per drawing and Technical Specifications		
A	Random Rubble Masonry	cum	2669.00
B	Coursed rubble masonry (first sort )	cum	2743.00
C	Ashlar masonry ( first sort )	cum	3435.00
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	3949.00
B	PCC Grade M20		
(p)	Height upto 5m	cum	4297.00
C	PCC Grade M25		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	4754.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4760.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	4927.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4933.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	5143.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5149.00
D	PCC Grade M30		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	4804.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4805.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	4978.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4980.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	5197.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5198.00
E	RCC Grade M20		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	4398.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4401.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	4558.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4561.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	4758.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4761.00

## Summary of Rate Analysis

F	RCC Grade M25		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	4861.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5229.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	5020.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5400.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	5259.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5657.00
G	RCC Grade M30		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	4888.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	4893.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	5026.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5031.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	5222.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5227.00
H	RCC Grade M35		
(p)	Height upto 5m		
Case I	Using concrete Mixer	cum	5014.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5403.00
(q)	Height 5m to 10m		
Case I	Using concrete Mixer	cum	5123.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5521.00
(r)	Height above 10m		
Case I	Using concrete Mixer	cum	5287.00
Case II	With Batching Plant, Transit Mixer and Concrete Pump	cum	5697.00
13.6	Supplying, fitting and placing HYSD bar reinforcement in sub-structure complete as per drawing and technical specifications	tonne	64324.00
13.7	Supplying, fitting and placing Mild steel reinforcement complete in sub-structure as per drawing and technical specification	tonne	65620.00
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	125.00
13.9	Back filling behind abutment, wing wall and return wall complete as per drawing and Technical specification		
A	Granular material	cum	504.00
B	(i) Sandy material - Fine Sand	cum	481.00
	(ii) Sandy material - Coarse Sand	cum	514.00
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	834.00
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	414.00
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	249.00

### Summary of Rate Analysis

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	0.02
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	524.00
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	#VALUE!



## Analysis of Rate

### CHAPTER-13 SUB-STRUCTURE

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Bricks 1st class	each	500.00	5.636	2818.00	M-079
		Cement mortar 1:3 (Rate as in Item 12.6 A sub-analysis)	cum	0.24	3074.00	737.76	Item 12.6 (A)
		b) Labour					
		Mate	day	0.06	171.00	10.26	L-12
		Mason	day	0.80	213.00	170.40	L-11
		Mazdoor	day	0.80	157.00	125.60	L-13
		Add for scaffolding @ 5 per cent of cost of material and labour				193.10	
		c) Overhead charges @ 0.25 on (a+b)				1013.78	
		d) Contractor's profit @ 0.1 on (a+b+c)				506.89	
		Rate per cum (a+b+c+d)				5575.79	
					<i>say</i>	<u>5576.00</u>	
13.2	1300 & 2200	Pointing with cement mortar (1:3 ) on brick work in substructure as per Technical Specifications					
		<i>Unit = 10 sqm</i>					
		<i>Taking output = 10 sqm</i>					
		a) Material					
		Cement mortar 1:3 (Rate as in Item 12.6 )	cum	0.03	3074.00	92.22	Item 12.6 (A)
		b) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mason	day	0.50	213.00	106.50	L-11
		Mazdoor	day	0.50	157.00	78.50	L-13
		c) Overhead charges @ 0.25 on (a+b)				71.02	
		d) Contractor's profit @ 0.1 on (a+b+c)				35.51	
		Rate per 10 sqm (a+b+c+d)				390.58	
					<i>say</i>	<u>391.00</u>	
	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					
		<i>Unit = 10 sqm</i>					
		<i>Taking output = 10 sqm</i>					
		a) Material					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.144	3074.00	442.66	Item 12.6 (A)
		b) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mason	day	0.50	213.00	106.50	L-11
		Mazdoor	day	0.50	157.00	78.50	L-13
		c) Overhead charges @ 0.25 on (a+b)				158.62	
		d) Contractor's profit @ 0.1 on (a+b+c)				79.31	
		Rate per 10 sqm (a+b+c+d)				872.43	
					<i>say</i>	<u>872.00</u>	
	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 )					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Stone	cum	1.00	294.26	294.26	M-148
		Through and bond stone	No	7.00	11.25	78.75	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.33	3074.00	1014.42	Item 12.6 (A)
		b) Labour					
		Mate	day	0.10	171.00	17.10	L-12
		Mason	day	1.20	213.00	255.60	L-11
		Mazdoor	day	1.20	157.00	188.40	L-13
		Add for scaffolding @ 5 per cent of cost of a) Material and b) Labour				92.43	
		c) Overhead charges @ 0.25 on (a+b)				485.24	
		d) Contractor's profit @ 0.1 on (a+b+c)				242.62	
		Rate per cum (a+b+c+d)				2668.82	
					say	<u>2669.00</u>	
13.4	B	Coursed rubble masonry (first sort )					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Stone	cum	1.10	294.26	323.69	M-148
		Through and bond stone	each	7.00	11.25	78.75	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.30	3074.00	922.20	Item 12.6 (A)
		b) Labour					
		Mate	day	0.12	171.00	20.52	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	1.50	157.00	235.50	L-13
		Add for scaffolding @ 5 per cent of cost of material and labour				95.01	
		c) Overhead charges @ 0.25 on (a+b)				498.79	
		d) Contractor's profit @ 0.1 on (a+b+c)				249.40	
		Rate per cum (a+b+c+d)				2743.35	
					say	<u>2743.00</u>	
13.4	C	Ashlar masonry ( first sort )					
		Plain ashlar					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Stone	cum	1.11	294.26	326.63	M-169
		Through and bond stone	each	7.00	11.25	78.75	M-182
		(7no.x0.24mx0.24mx0.39m = 0.16 cu.m)					
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.33	3074.00	1014.42	Item 12.6 (A)
		b) Labour for masonry work					
		Mate	day	0.20	171.00	34.20	L-12
		Mason	day	2.50	213.00	532.50	L-11
		Mazdoor	day	2.50	157.00	392.50	L-13
		Add for scaffolding @ 5 per cent of cost of a) Material and b) Labour				118.95	
		c) Overhead charges @ 0.25 on (a+b)				624.49	
		d) Contractor's profit @ 0.1 on (a+b+c)				312.24	
		Rate per cum (a+b+c+d)				3434.68	
					say	<u>3435.00</u>	
	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	Plain/Reinforced cement concrete in sub-structure complete as per drawing and Technical Specifications					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
	A	PCC Grade M15					
	(p)	Height upto 5m					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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)				2611.00	Item 12.8 (A)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		261.10	
		e) Overhead charges @ 0.25 on (a+b+c+d)				718.03	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				359.01	
		Rate per cum (a+b+c+d+e+f)				3949.14	
					say	<u>3949.00</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)				2841.00	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		284.10	
		e) Overhead charges @ 0.25 on (a+b+c+d)				781.28	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				390.64	
		Rate per cum (a+b+c+d+e+f)				4297.01	
					say	<u>4297.00</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				3143.00	Item 12.8 (D)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		314.30	
		e) Overhead charges @ 0.25 on (a+b+c+d)				864.33	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				432.16	
		Rate per cum (a+b+c+d+e+f)				4753.79	
					say	<u>4754.00</u>	
13.5 C	Case II	With Batching Plant, Transit Mixer and Concrete Pump					
(p)		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (D) Case II				3147.00	Item 12.8 (D)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		314.70	
		e) Overhead charges @ 0.25 on (a+b+c+d)				865.43	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				432.71	
		Rate per cum (a+b+c+d+e+f)				4759.84	
					say	<u>4760.00</u>	
13.5 C	(q)	Height 5m to 10m					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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				3143.00	Item 12.8 (D)
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		377.16	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		62.86	
		e) Overhead charges @ 0.25 on (a+b+c+d)				895.76	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				447.88	
		Rate per cum (a+b+c+d+e+f)				4926.65	
					say	<u>4927.00</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				3147.00	Item 12.8 (D)
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		377.64	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		62.94	
		e) Overhead charges @ 0.25 on (a+b+c+d)				896.90	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				448.45	
		Rate per cum (a+b+c+d+e+f)				4932.92	
					say	<u>4933.00</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				3143.00	Item 12.8 (D)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		471.45	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		125.72	
		e) Overhead charges @ 0.25 on (a+b+c+d)				935.04	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				467.52	
		Rate per cum (a+b+c+d+e+f)				5142.73	
					say	<u>5143.00</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				3147.00	Item 12.8 (D)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		472.05	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		125.88	
		e) Overhead charges @ 0.25 on (a+b+c+d)				936.23	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				468.12	
		Rate per cum (a+b+c+d+e+f)				5149.28	
					say	<u>5149.00</u>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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				3176.00	Item 12.8 (F)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		317.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				873.40	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				436.70	
		Rate per cum (a+b+c+d+e+f)				4803.70	
						say	<u>4804.00</u>
13.5 D		Case II With Batching Plant, Transit Mixer and Concrete Pump					
(p)		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case II				3177.00	Item 12.8 (F)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		317.70	
		e) Overhead charges @ 0.25 on (a+b+c+d)				873.68	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				436.84	
		Rate per cum (a+b+c+d+e+f)				4805.21	
						say	<u>4805.00</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				3176.00	Item 12.8 (F)
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		381.12	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		63.52	
		e) Overhead charges @ 0.25 on (a+b+c+d)				905.16	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				452.58	
		Rate per cum (a+b+c+d+e+f)				4978.38	
						say	<u>4978.00</u>
13.5 D		Case II With Batching Plant, Transit Mixer and Concrete Pump					
(q)		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (F) Case II				3177.00	Item 12.8 (F)
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		381.24	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		63.54	
		e) Overhead charges @ 0.25 on (a+b+c+d)				905.45	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				452.72	
		Rate per cum (a+b+c+d+e+f)				4979.95	
						say	<u>4980.00</u>
13.5 D		(r) Height above 10m					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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				3176.00	Item 12.8 (F)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		476.40	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		127.04	
		e) Overhead charges @ 0.25 on (a+b+c+d)				944.86	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				472.43	
		Rate per cum (a+b+c+d+e+f)				5196.73	
					say	<u>5197.00</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				3177.00	Item 12.8 (F)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		476.55	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		127.08	
		e) Overhead charges @ 0.25 on (a+b+c+d)				945.16	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				472.58	
		Rate per cum (a+b+c+d+e+f)				5198.37	
					say	<u>5198.00</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				2908.00	Item 12.8 (C)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		290.80	
		e) Overhead charges @ 0.25 on (a+b+c+d)				799.70	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				399.85	
		Rate per cum (a+b+c+d+e+f)				4398.35	
					say	<u>4398.00</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				2910.00	Item 12.8 (C)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		291.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				800.25	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				400.13	
		Rate per cum (a+b+c+d+e+f)				4401.38	
					say	<u>4401.00</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 .					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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				2908.00	Item 12.8 (C)
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		348.96	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		58.16	
		e) Overhead charges @ 0.25 on (a+b+c+d)				828.78	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				414.39	
		Rate per cum (a+b+c+d+e+f)				4558.29	
					say	<u>4558.00</u>	
13.5 E (g)		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				2910.00	Item 12.8 (C)
		d) formwork					
		Add 12 per cent of cost of material, labour and machinery (a+b+c) for Formwork		12.00		349.20	
		Add 2 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		2.00		58.20	
		e) Overhead charges @ 0.25 on (a+b+c+d)				829.35	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				414.68	
		Rate per cum (a+b+c+d+e+f)				4561.43	
					say	<u>4561.00</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				2908.00	Item 12.8 (C)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		436.20	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		116.32	
		e) Overhead charges @ 0.25 on (a+b+c+d)				865.13	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				432.57	
		Rate per cum (a+b+c+d+e+f)				4758.22	
					say	<u>4758.00</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				2910.00	Item 12.8 (C)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		436.50	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		116.40	
		e) Overhead charges @ 0.25 on (a+b+c+d)				865.73	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				432.86	
		Rate per cum (a+b+c+d+e+f)				4761.49	
					say	<u>4761.00</u>	
13.5	F	RCC Grade M25					
	(p)	Height upto 5m					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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				3214.00	Item 12.8 (E)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		321.40	
		e) Overhead charges @ 0.25 on (a+b+c+d)				883.85	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				441.93	
		Rate per cum (a+b+c+d+e+f)				4861.18	
					say	<u>4861.00</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				3457.00	Item 12.8 (E)
		d) formwork					DIR used item
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		345.70	
		e) Overhead charges @ 0.25 on (a+b+c+d)				950.68	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				475.34	
		Rate per cum (a+b+c+d+e+f)				5228.71	
					say	<u>5229.00</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				3214.00	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		379.25	
		Add 1.8 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.80		57.85	
		e) Overhead charges @ 0.25 on (a+b+c+d)				912.78	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				456.39	
		Rate per cum (a+b+c+d+e+f)				5020.27	
					say	<u>5020.00</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				3457.00	Item 12.8 (E)
		d) formwork					DIR used item
		Add 11.8 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.80		407.93	
		Add 1.8 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.80		62.23	
		e) Overhead charges @ 0.25 on (a+b+c+d)				981.79	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				490.89	
		Rate per cum (a+b+c+d+e+f)				5399.83	
					say	<u>5400.00</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					



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Per Cum Basic Cost of Labour, Material & Machinery (a+b+c) of Item 12.8 (E) Case I				3214.00	Item 12.8 (E)
		d) formwork					
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		482.10	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		128.56	
		e) Overhead charges @ 0.25 on (a+b+c+d)				956.17	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				478.08	
		Rate per cum (a+b+c+d+e+f)				5258.91	
					say	<u>5259.00</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				3457.00	Item 12.8 (E)
		d) formwork					DIR used item
		Add 15 per cent of cost of material, labour and machinery (a+b+c) for Formwork		15.00		518.55	
		Add 4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		4.00		138.28	
		e) Overhead charges @ 0.25 on (a+b+c+d)				1028.46	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				514.23	
		Rate per cum (a+b+c+d+e+f)				5656.52	
					say	<u>5657.00</u>	
13.5	G	RCC Grade M30					
	(p)	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				3232.00	Item 12.8 (G)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		323.20	
		e) Overhead charges @ 0.25 on (a+b+c+d)				888.80	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				444.40	
		Rate per cum (a+b+c+d+e+f)				4888.40	
					say	<u>4888.00</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				3235.00	Item 12.8 (G)
		d) formwork					
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		323.50	
		e) Overhead charges @ 0.25 on (a+b+c+d)				889.63	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				444.81	
		Rate per cum (a+b+c+d+e+f)				4892.94	
					say	<u>4893.00</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				3232.00	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		371.68	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 1.6 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.60		51.71	
		e) Overhead charges @ 0.25 on (a+b+c+d)				913.85	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				456.92	
		Rate per cum (a+b+c+d+e+f)				5026.16	
					say	<u>5026.00</u>	
13.5 G (g)	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				3235.00	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		372.03	
		Add 1.6 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.60		51.76	
		e) Overhead charges @ 0.25 on (a+b+c+d)				914.70	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				457.35	
		Rate per cum (a+b+c+d+e+f)				5030.83	
					say	<u>5031.00</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				3232.00	Item 12.8 (G)
		d) formwork					
		Add 14 per cent of cost of material, labour and machinery (a+b+c) for Formwork		14.00		452.48	
		Add 3.5 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.50		113.12	
		e) Overhead charges @ 0.25 on (a+b+c+d)				949.40	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				474.70	
		Rate per cum (a+b+c+d+e+f)				5221.70	
					say	<u>5222.00</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				3235.00	Item 12.8 (G)
		d) formwork					
		Add 14 per cent of cost of material, labour and machinery (a+b+c) for Formwork		14.00		452.90	
		Add 3.5 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.50		113.23	
		e) Overhead charges @ 0.25 on (a+b+c+d)				950.28	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				475.14	
		Rate per cum (a+b+c+d+e+f)				5226.55	
					say	<u>5227.00</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				3315.00	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		331.50	
		e) Overhead charges @ 0.25 on (a+b+c+d)				911.63	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				455.81	
		Rate per cum (a+b+c+d+e+f)				5013.94	
					say	<u>5014.00</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				3572.00	Item 12.8 (H)
		d) formwork					DIR used item
		Add 10 per cent of cost of material, labour and machinery (a+b+c) for Formwork		10.00		357.20	
		e) Overhead charges @ 0.25 on (a+b+c+d)				982.30	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				491.15	
		Rate per cum (a+b+c+d+e+f)				5402.65	
					say	<u>5403.00</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				3315.00	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		364.65	
		Add 1.4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.40		46.41	
		e) Overhead charges @ 0.25 on (a+b+c+d)				931.52	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				465.76	
		Rate per cum (a+b+c+d+e+f)				5123.33	
					say	<u>5123.00</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				3572.00	Item 12.8 (H)
		d) formwork					
		Add 11 per cent of cost of material, labour and machinery (a+b+c) for Formwork		11.00		392.92	
		Add 1.4 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		1.40		50.01	
		e) Overhead charges @ 0.25 on (a+b+c+d)				1003.73	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				501.87	
		Rate per cum (a+b+c+d+e+f)				5520.53	
					say	<u>5521.00</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				3315.00	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		430.95	
		Add 3 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.00		99.45	
		e) Overhead charges @ 0.25 on (a+b+c+d)				961.35	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				480.68	
		Rate per cum (a+b+c+d+e+f)				5287.43	
					say	<u>5287.00</u>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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				3572.00	Item 12.8 (H)
		d) formwork					
		Add 13 per cent of cost of material, labour and machinery (a+b+c) for Formwork		13.00		464.36	
		Add 3 per cent of cost of material, Labour and machinery excluding formwork to cater for extra lift		3.00		107.16	
		e) Overhead charges @ 0.25 on (a+b+c+d)				1035.88	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				517.94	
		Rate per cum (a+b+c+d+e+f)				5697.34	
					say	<u>5697.00</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					
		<b>Output: MT</b>					
		<b>Taking output = 1 MT</b>					
		a) Material					
		HYSD bars including 5 per cent overlaps and wastage	tonne	1.05	42812.50	44953.13	M-082
		Binding wire	kg	6.00	53.85	323.10	M-072
		b) Labour for cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.34	171.00	58.14	L-12
		Blacksmith	day	2.00	213.00	426.00	L-02a
		Mazdoor	day	6.50	157.00	1020.50	L-13
		c) Overhead charges @ 0.25 on (a+b)				11695.22	
		d) Contractor's profit @ 0.1 on (a+b+c)				5847.61	
		Rate for per MT (a+b+c+d)				64323.69	
					say	<u>64324.00</u>	
13.7	1600 & 2200	Supplying, fitting and placing Mild steel reinforcement complete in sub-structure as per drawing and Technical Specification					
		<b>Unit = MT</b>					
		<b>Taking output = 1 MT</b>					
		a) Material					
		MS bars including 5 per cent overlaps and wastage	tonne	1.05	43971.42	46169.99	M-126
		Binding wire	kg	6.00	53.85	323.10	M-072
		b) Labour for straightening, cutting, bending, shifting to site, tying and placing in position					
		Mate	day	0.28	171.00	47.88	L-12
		Blacksmith	day	1.50	213.00	319.50	L-02a
		Mazdoor	day	5.50	157.00	863.50	L-13
		c) Overhead charges @ 0.25 on (a+b)				11930.99	
		d) Contractor's profit @ 0.1 on (a+b+c)				5965.50	
		Rate for per MT (a+b+c+d)				65620.46	
					say	<u>65620.00</u>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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					
		<i>Unit = Nos.</i>					
		<i>Taking output = 30 Nos.</i>					
		a) Material					
		AC pipe 100 mm dia. (including wastage @ 5 per cent)	metre	31.50	44.72	1408.68	M-056
		Average length of weep hole is taken as one metre for the purpose of estimating.					
		MS clamp	each.	30.00	32.07	962.10	M-123
		collar for AC pipe (average) taking 10% of above pipe rate	each.	10.00	4.47	44.72	M-056/10
		Cement mortar 1:3 (Rate as in Item 12.6)	cum	0.05	3074.00	153.70	Item 12.6 (A)
		b) Labour					
		Mate	day	0.03	171.00	5.13	L-12
		Mason	day	0.50	213.00	106.50	L-11
		Mazdoor	day	0.25	157.00	39.25	L-13
		c) Overhead charges @ 0.25 on (a+b)				680.02	
		d) Contractor's profit @ 0.1 on (a+b+c)				340.01	
		Cost for 30 m = a+b+c+d				3740.11	
		Rate per No. (a+b+c+d)/30				124.67	
					<i>say</i>	<u>125.00</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					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum</i>					
		A Granular material					
		a) Labour					
		Mate	day	0.28	171.00	47.88	L-12
		Mazdoor	day	7.00	157.00	1099.00	L-13
		b) Material					
		Granular material	cum	12.00	127.69	1532.28	M-009
		c) Machinery					
		Plate compactor/power rammer	hour	2.50	392.00	980.00	P&M-086
		Water Tanker	hour	0.05	154.00	7.70	P&M-060
		d) Overhead charges @ 0.25 on (a+b+c)				916.72	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				458.36	
		Cost for 10 cum of granular backfill = a+b+c+d+e				5041.93	
		Rate per cum = (a+b+c+d+e)/10				504.19	
					<i>say</i>	<u>504.00</u>	
13.9		B Sandy material					
		a) Labour					
		Mate	day	0.28	171.00	47.88	L-12
		Mazdoor for filling, watering, ramming etc.	day	7.00	157.00	1099.00	L-13
		b) Material					
		Sand (Fine)	cum	12.00	113.71	1364.52	M-006
		c) Machinery					
		Plate compactor/power rammer	hour	2.50	392.00	980.00	P&M-086

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Water Tanker	hour	0.06	154.00	9.24	P&M-060
		d) Overhead charges @ 0.25 on (a+b+c)				875.16	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				437.58	
		Cost for 10 cum of sandy backfill = a+b+c+d+e				4813.38	
		Rate per cum = (a+b+c+d+e)/10				481.34	
					say	<u>481.00</u>	
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.					
		<i>Unit = cum</i>					
		<i>Taking output = 10 cum.</i>					
		a) Labour					
		Mate	day	0.32	171.00	54.72	L-12
		Mazdoor for filling, watering, ramming etc.	day	7.00	157.00	1099.00	L-13
		Mazdoor (Skilled)	day	1.00	200.00	200.00	L-15
		b) Material					
		Filter media of stone aggregate conforming to clause 2504.2.2. of MoRTH specifications.	cum	12.00	391.93	4703.16	M-012
		c) Machinery					
		Water Tanker of 6 KL capacity	hour	0.06	154.00	9.24	P&M-060
		d) Overhead charges @ 0.25 on (a+b+c)				1516.53	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				758.27	
		cost for 10 cum of Fiter Media = a+b+c+d+e				8340.92	
		Rate per cum = (a+b+c+d+e)/10				834.09	
					say	<u>834.00</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	171.00	10.26	L-12
		Mazdoor (Skilled)	day	0.50	200.00	100.00	L-15
		Mazdoor	day	1.00	157.00	157.00	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	74250.00	74250.00	M-065
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.				742.50	
		c) Overhead charges @ 0.25 on (a+b)				18814.94	
		d) Contractor's profit @ 0.1 on (a+b+c)				9407.47	
		cost for 250 tonnes capacity bearing = a+b+c+d				103482.17	
		Rate per tonne capacity = (a+b+c+d)/250				413.93	
					say	<u>414.00</u>	
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					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Considering a 250 tonne capacity bearing for this analysis					
		a) Labour					
		Mate	day	0.06	171.00	10.26	L-12
		Mazdoor	day	1.00	157.00	157.00	L-13
		Mazdoor (Skilled)	day	0.50	200.00	100.00	L-15
		b) Material					
		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	44550.00	44550.00	M-067
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts, lifting arrangements, grease and other consumables.				445.50	
		c) Overhead charges @ 0.25 on (a+b)				11315.69	
		d) Contractor's profit @ 0.1 on (a+b+c)				5657.85	
		cost for 250 tonnes capacity bearing = a+b+c+d				62236.30	
		Rate per tonne capacity = (a+b+c+d)/250				248.95	
					say	<u>249.00</u>	
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					
		a) Labour					
		Mate	day	0.06	171.00	10.26	L-12
		Mazdoor	day	1.00	157.00	157.00	L-13
		Mazdoor (Skilled)	day	0.50	200.00	100.00	L-15
		b) Material					
		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!	
		c) Overhead charges @ 0.25 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		cost for 80 tonnes capacity bearing = a+b+c+d				#VALUE!	
		Rate per tonne capacity = (a+b+c+d)/80				#VALUE!	
					say	<u>#VALUE!</u>	
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.					
		a) Labour					
		Mate	day	0.06	171.00	10.26	L-12
		Mazdoor	day	1.00	157.00	157.00	L-13
		Mazdoor (Skilled)	day	0.50	200.00	100.00	L-15
		b) Material					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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.	each.	1.00	0.58	0.58	M-066
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				0.01	
		c) Overhead charges @ 0.25 on (a+b)				66.96	
		d) Contractor's profit @ 0.1 on (a+b+c)				33.48	
		cost for 19200cc of elastomeric bearing = a+b+c+d				368.29	
		Rate per cc of elastomeric bearing = (a+b+c+d)/19200				0.02	
					say	0.02	
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.					
		a) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mazdoor	day	0.75	157.00	117.75	L-13
		Mazdoor (Skilled)	day	0.35	200.00	70.00	L-15
		b) Material					
		Supply of sliding plate bearing of 80 tonne design capacity complete as per drawings and Technical Specifications.	each.	1.00	30000.00	30000.00	M-070
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				300.00	
		c) Overhead charges @ 0.25 on (a+b)				7623.65	
		d) Contractor's profit @ 0.1 on (a+b+c)				3811.82	
		cost for 80 tonnes of capacity bearing = a+b+c+d				41930.06	
		Rate per tonne Capacity =(a+b+c+d) / 80				524.13	
					say	<u>524.00</u>	
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.					
		a) Labour					
		Mate	day	0.08	171.00	13.68	L-12
		Mazdoor	day	1.50	157.00	235.50	L-13
		Mazdoor (Skilled)	day	0.50	200.00	100.00	L-15
		b) Material					
		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.	each.	1.00	input	#VALUE!	M-068



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 1 per cent of cost of bearing assembly for foundation anchorage bolts and consumables.				#VALUE!	
		c) Overhead charges @ 0.25 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		cost for 250 tonnes capacity bearing = a+b+c+d				#VALUE!	
		Rate per tonne capacity = (a+b+c+d)/250				#VALUE!	
					say	#VALUE!	

## 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 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.	Descriptions	Unit	Rate (in Rs.)
14.1	Furnishing and Placing Reinforced/Prestressed cement concrete in super-structure as per drawing and Technical Specification		
<b>A</b>	<b>RCC Grade M20</b>		
<b>Case I</b>	<b>Using Concrete Mixer</b>		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	4743.00
(q)	Height 5m to 10m	cum	4940.00
(r)	Height above 10m	cum	5138.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	4940.00
(q)	Height 5m to 10m	cum	5138.00
(r)	Height above 10m	cum	5336.00
<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	4745.00
(q)	Height 5m to 10m	cum	4942.00
(r)	Height above 10m	cum	5140.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	4942.00
(q)	Height 5m to 10m	cum	5140.00
(r)	Height above 10m	cum	5338.00
<b>B</b>	<b>RCC Grade M25</b>		
<b>Case I</b>	<b>Using Concrete Mixer</b>		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	5265.00
(q)	Height 5m to 10m	cum	5485.00
(r)	Height above 10m	cum	5704.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	5485.00
(q)	Height 5m to 10m	cum	5704.00
(r)	Height above 10m	cum	5924.00
<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	5273.00
(q)	Height 5m to 10m	cum	5493.00
(r)	Height above 10m	cum	5712.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	5493.00
(q)	Height 5m to 10m	cum	5712.00
(r)	Height above 10m	cum	5932.00
<b>C</b>	<b>RCC Grade M 30</b>		
<b>Case I</b>	<b>Using Concrete Mixer</b>		
(i)	For solid slab super-structure, 20-30% of (a+b+c)		
(p)	Height upto 5m	cum	5350.00
(q)	Height 5m to 10m	cum	5572.00
(r)	Height above 10m	cum	5795.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		

## Summary of Rate Analysis

(p)	Height upto 5m	cum	5572.00
(q)	Height 5m to 10m	cum	5795.00
(r)	Height above 10m	cum	6018.00
<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	5339.00
(q)	Height 5m to 10m	cum	5561.00
(r)	Height above 10m	cum	5784.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	5561.00
(q)	Height 5m to 10m	cum	5784.00
(r)	Height above 10m	cum	6006.00
<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	5396.00
(q)	Height 5m to 10m	cum	5625.00
(r)	Height above 10m	cum	5854.00
(ii)	For T-beam & slab, 23-33% of (a+b+c)		
(p)	Height upto 5m	cum	5625.00
(q)	Height 5m to 10m	cum	5854.00
(r)	Height above 10m	cum	6082.00
(iii)	For box girder and balanced cantilever, 38-58% of cost of concrete.		
(p)	Height upto 5m	cum	6311.00
(q)	Height 5m to 10m	cum	6768.00
(r)	Height above 10m	cum	7226.00
<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	5386.00
(q)	Height 5m to 10m	cum	5614.00
(r)	Height above 10m	cum	5842.00
(ii)	For T-beam & slab, 23-33% of (a+b+c)		
(p)	Height upto 5m	cum	5614.00
(q)	Height 5m to 10m	cum	5842.00
(r)	Height above 10m	cum	6070.00
(iii)	For box girder and balanced cantilever, 38-58% of cost of concrete.		
(p)	Height upto 5m	cum	6298.00
(q)	Height 5m to 10m	cum	6755.00
(r)	Height above 10m	cum	7211.00
<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	6016.00
(q)	Height 5m to 10m	cum	6266.00
(r)	Height above 10m	cum	6517.00
(ii)	For T-beam & slab, 25-35% of (a+b+c)		
(p)	Height upto 5m	cum	6266.00
(q)	Height 5m to 10m	cum	6517.00
(r)	Height above 10m	cum	6768.00
<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)		

## Summary of Rate Analysis

(p)	Height upto 5m	cum	5879.00
(q)	Height 5m to 10m	cum	6128.00
(r)	Height above 10m	cum	6377.00
(ii)	For T-beam & slab, 23-33% of (a+b+c)		
(p)	Height upto 5m	cum	6128.00
(q)	Height 5m to 10m	cum	6377.00
(r)	Height above 10m	cum	6626.00
(iii)	For box girder and balanced cantilever, 38-58% of cost of concrete.		
(p)	Height upto 5m	cum	6875.00
(q)	Height 5m to 10m	cum	7373.00
(r)	Height above 10m	cum	7872.00
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	6118.00
(q)	Height 5m to 10m	cum	6381.00
(r)	Height above 10m	cum	6645.00
(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	6381.00
(q)	Height 5m to 10m	cum	6645.00
(r)	Height above 10m	cum	6909.00
(iii)	For cast-in-situ box girder, segmental construction and balanced cantilever, 36-56% of cost of concrete.		
(p)	Height upto 5m	cum	7172.00
(q)	Height 5m to 10m	cum	7700.00
(r)	Height above 10m	cum	8227.00
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	7401.00
(q)	Height 5m to 10m	cum	7949.00
(r)	Height above 10m	cum	8497.00
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	7842.00
(q)	Height 5m to 10m	cum	8422.00
(r)	Height above 10m	cum	9003.00
14.2	a) Supplying, fitting and placing HYSD bar reinforcement in super-structure complete as per drawing and technical specifications	tonne	65112.00
14.3	High tensile steel wires/strands including all accessories for stressing, stressing operations and grouting complete as per drawing and Technical Specifications	tonne	121698.00
14.4	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications	cum	9368.00
14.5	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.)	sqm	314.00
14.6	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.	metre	1651.00

## Summary of Rate Analysis

14.7	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.	metre	1598.00
14.8	Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification	metre	3036.00
14.9	Drainage Spouts complete as per drawing and Technical specification	each	877.00
14.10	PCC M15 Grade leveling course below approach slab complete as per drawing and Technical specification	cum	3590.00
14.11	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification	cum	7793.00
14.12	Providing anti-corrosive treatment to HYSD reinforcement with Fusion Bonded Epoxy Coating (FBEC) (To be taken as per the prevailing market rates.)	tonne	VALUE
14.13	Precast - pretensioned Girders (Providing, precasting, transportation and placing in position precast pretensioned concrete girders as per drawing and technical specifications)	cum	#VALUE!
14.14	Providing and fixing Helical pipes in voided concrete slabs	metre	#VALUE!
14.15	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.)	metre	VALUE
14.16	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. )	metre	90.00
14.17	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.)	metre	1002.00
14.18	Filler joint		
(i)	Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.	metre	4370.00
(ii)	Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.	metre	280.00
(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.	metre	393.00
(iv)	Providing and filling joint sealing compound as per drawings and technical specifications with coarse sand and 6% bitumen by weight	metre	17.40
14.19	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.)	metre	1125.00
14.20	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 & bridge works.)	metre	37171.00
14.21	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.)	metre	#VALUE!
14.22	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.)	metre	11548.00
14.23	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.)	metre	39010.00

### Summary of Rate Analysis

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 Rate

### CHAPTER-14 SUPER-STRUCTURE

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	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					
			<i>Unit = 1 cum</i>					
			<i>Taking output = 15 cum</i>					
		a)	Material					
			Cement	tonne	5.12	5462.00	27965.44	M-081
			Coarse sand	cum	6.75	133.28	899.64	M-005
			20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
			10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b)	Labour					
			Mate	day	0.86	171.00	147.06	L-12
			Mason	day	1.50	213.00	319.50	L-11
			Mazdoor	day	20.00	157.00	3140.00	L-13
		c)	Machinery					
			Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
			Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
			<i>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</i>		<b>43116.00</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				43116.00	
		d)	Formwork and staging 20 per cent of (a+b+c)				8623.20	
		e)	Overhead charges @ 0.25 on (a+b+c+d)				12934.80	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				6467.40	
			Cost for 15 cum = a+b+c+d+e+f				71141.40	
			Rate per cum = (a+b+c+d+e+f)/15				4742.76	
							<i>say</i>	<b>4743.00</b>
14.1A Case I (i)		(q)	Height 5m to 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				43116.00	
		d)	Formwork and staging 25 per cent of (a+b+c)				10779.00	
		e)	Overhead charges @ 0.25 on (a+b+c+d)				13473.75	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				6736.88	
			Cost for 15 cum = a+b+c+d+e+f				74105.63	
			Rate per cum = (a+b+c+d+e+f)/15				4940.38	
							<i>say</i>	<b>4940.00</b>
14.1A Case I (i)		(r)	Height above 10m					
			Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				43116.00	
		d)	Formwork and staging 30 per cent of (a+b+c)				12934.80	
		e)	Overhead charges @ 0.25 on (a+b+c+d)				14012.70	
		f)	Contractor's profit @ 0.1 on (a+b+c+d+e)				7006.35	
			Cost for 15 cum = a+b+c+d+e+f				77069.85	
			Rate per cum = (a+b+c+d+e+f)/15				5137.99	
							<i>say</i>	<b>5138.00</b>
14.1A Case I		(ii)	For T-beam & slab, 25-35 per cent of (a+b+c)					



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		(p) Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				43116.00	
		d) Formwork and staging 25 per cent of (a+b+c)				10779.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				13473.75	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				6736.88	
		Cost for 15 cum = a+b+c+d+e+f				74105.63	
		Rate per cum = (a+b+c+d+e+f)/15				4940.38	
					say	<u>4940.00</u>	
14.1A Case I (ii)		(q) Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				43116.00	
		d) Formwork and staging 30 per cent of (a+b+c)				12934.80	
		e) Overhead charges @ 0.25 on (a+b+c+d)				14012.70	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7006.35	
		Cost for 15 cum = a+b+c+d+e+f				77069.85	
		Rate per cum = (a+b+c+d+e+f)/15				5137.99	
					say	<u>5138.00</u>	
14.1A Case I (ii)		(r) Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				43116.00	
		d) Formwork and staging 35 per cent of (a+b+c)				15090.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				14551.65	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7275.83	
		Cost for 15 cum = a+b+c+d+e+f				80034.08	
		Rate per cum = (a+b+c+d+e+f)/15				5335.61	
					say	<u>5336.00</u>	
14.1A		Case II Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	40.92	5462.00	223505.04	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	Lead =1 km & P&M-050
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>345063.00</b>			
		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					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				345063.00	
		d) Formwork and staging 20 per cent of (a+b+c)				69012.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				103518.90	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				51759.45	
		Cost for 120 cum = a+b+c+d+e+f				569353.95	
		Rate per cum = (a+b+c+d+e+f)/120				4744.62	
					say	<u>4745.00</u>	
14.1A Case II (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				345063.00	
		d) Formwork and staging 25 per cent of (a+b+c)				86265.75	
		e) Overhead charges @ 0.25 on (a+b+c+d)				107832.19	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				53916.09	
		Cost for 120 cum = a+b+c+d+e+f				593077.03	
		Rate per cum = (a+b+c+d+e+f)/120				4942.31	
					say	<u>4942.00</u>	
14.1A Case II (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				345063.00	
		d) Formwork and staging 30 per cent of (a+b+c)				103518.90	
		e) Overhead charges @ 0.25 on (a+b+c+d)				112145.48	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				56072.74	
		Cost for 120 cum = a+b+c+d+e+f				616800.11	
		Rate per cum = (a+b+c+d+e+f)/120				5140.00	
					say	<u>5140.00</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				345063.00	
		d) Formwork and staging 25 per cent of (a+b+c)				86265.75	
		e) Overhead charges @ 0.25 on (a+b+c+d)				107832.19	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				53916.09	
		Cost for 120 cum = a+b+c+d+e+f				593077.03	
		Rate per cum = (a+b+c+d+e+f)/120				4942.31	
					say	<u>4942.00</u>	
14.1A Case II (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				345063.00	
		d) Formwork and staging 30 per cent of (a+b+c)				103518.90	
		e) Overhead charges @ 0.25 on (a+b+c+d)				112145.48	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				56072.74	
		Cost for 120 cum = a+b+c+d+e+f				616800.11	
		Rate per cum = (a+b+c+d+e+f)/120				5140.00	
					say	<u>5140.00</u>	
14.1A Case II (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				345063.00	
		d) Formwork and staging 35 per cent of (a+b+c)				120772.05	
		e) Overhead charges @ 0.25 on (a+b+c+d)				116458.76	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				58229.38	
		Cost for 120 cum = a+b+c+d+e+f				640523.19	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per cum = (a+b+c+d+e+f)/120				5337.69	
					<i>say</i>	<u>5338.00</u>	
14.1	B	RCC Grade M25					
	Case I	Using Concrete Mixer					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	5.99	5462.00	32717.38	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.86	171.00	147.06	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		<i>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</i>			<b>47868.00</b>		
		For formwork and staging add the following:					
14.1B 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				47868.00	
		d) Formwork and staging 20 per cent of (a+b+c)				9573.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				14360.40	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7180.20	
		Cost for 15 cum = a+b+c+d+e+f				78982.20	
		Rate per cum = (a+b+c+d+e+f)/15				5265.48	
					<i>say</i>	<u>5265.00</u>	
14.1B Case I (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				47868.00	
		d) Formwork and staging 25 per cent of (a+b+c)				11967.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				14958.75	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7479.38	
		Cost for 15 cum = a+b+c+d+e+f				82273.13	
		Rate per cum = (a+b+c+d+e+f)/15				5484.88	
					<i>say</i>	<u>5485.00</u>	
14.1B Case I (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				47868.00	
		d) Formwork and staging 30 per cent of (a+b+c)				14360.40	
		e) Overhead charges @ 0.25 on (a+b+c+d)				15557.10	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7778.55	
		Cost for 15 cum = a+b+c+d+e+f				85564.05	
		Rate per cum = (a+b+c+d+e+f)/15				5704.27	
					<i>say</i>	<u>5704.00</u>	
14.1B Case I	(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 15 cum				47868.00	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		d) Formwork and staging 25 per cent of (a+b+c)				11967.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				14958.75	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7479.38	
		Cost for 15 cum = a+b+c+d+e+f				82273.13	
		Rate per cum = (a+b+c+d+e+f)/15				5484.88	
					<i>say</i>	<u>5485.00</u>	
14.1B Case I (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				47868.00	
		d) Formwork and staging 30 per cent of (a+b+c)				14360.40	
		e) Overhead charges @ 0.25 on (a+b+c+d)				15557.10	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7778.55	
		Cost for 15 cum = a+b+c+d+e+f				85564.05	
		Rate per cum = (a+b+c+d+e+f)/15				5704.27	
					<i>say</i>	<u>5704.00</u>	
14.1B Case I (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				47868.00	
		d) Formwork and staging 35 per cent of (a+b+c)				16753.80	
		e) Overhead charges @ 0.25 on (a+b+c+d)				16155.45	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8077.73	
		Cost for 15 cum = a+b+c+d+e+f				88854.98	
		Rate per cum = (a+b+c+d+e+f)/15				5923.67	
					<i>say</i>	<u>5924.00</u>	
14.1B	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	47.95	5462.00	261902.90	M-081
		Coarse sand	cum	54.20	133.28	7223.78	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		b) Labour					
		Mate	day	0.84	171.00	143.64	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	18.00	157.00	2826.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	Lead =1 km & P&M-050
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>383488.00</b>			
		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				383488.00	
		d) Formwork and staging 20 per cent of (a+b+c)				76697.60	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Overhead charges @ 0.25 on (a+b+c+d)				115046.40	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				57523.20	
		Cost for 120 cum = a+b+c+d+e+f				632755.20	
		Rate per cum = (a+b+c+d+e+f)/120				5272.96	
					say	<u>5273.00</u>	
14.1B Case II (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				383488.00	
		d) Formwork and staging 25 per cent of (a+b+c)				95872.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				119840.00	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				59920.00	
		Cost for 120 cum = a+b+c+d+e+f				659120.00	
		Rate per cum = (a+b+c+d+e+f)/120				5492.67	
					say	<u>5493.00</u>	
14.1B Case II (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				383488.00	
		d) Formwork and staging 30 per cent of (a+b+c)				115046.40	
		e) Overhead charges @ 0.25 on (a+b+c+d)				124633.60	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				62316.80	
		Cost for 120 cum = a+b+c+d+e+f				685484.80	
		Rate per cum = (a+b+c+d+e+f)/120				5712.37	
					say	<u>5712.00</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				383488.00	
		d) Formwork and staging 25 per cent of (a+b+c)				95872.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				119840.00	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				59920.00	
		Cost for 120 cum = a+b+c+d+e+f				659120.00	
		Rate per cum = (a+b+c+d+e+f)/120				5492.67	
					say	<u>5493.00</u>	
14.1B Case II (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				383488.00	
		d) Formwork and staging 30 per cent of (a+b+c)				115046.40	
		e) Overhead charges @ 0.25 on (a+b+c+d)				124633.60	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				62316.80	
		Cost for 120 cum = a+b+c+d+e+f				685484.80	
		Rate per cum = (a+b+c+d+e+f)/120				5712.37	
					say	<u>5712.00</u>	
14.1B Case II (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				383488.00	
		d) Formwork and staging 35 per cent of (a+b+c)				134220.80	
		e) Overhead charges @ 0.25 on (a+b+c+d)				129427.20	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				64713.60	
		Cost for 120 cum = a+b+c+d+e+f				711849.60	
		Rate per cum = (a+b+c+d+e+f)/120				5932.08	
					say	<u>5932.00</u>	
14.1	C	RCC Grade M 30					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Case I Using Concrete Mixer					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	6.10	5462.00	33318.20	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.90	171.00	153.90	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	21.00	157.00	3297.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		<i>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</i>		<b>48632.00</b>			
		For formwork and staging add the following:					
14.1C 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				48632.00	
		d) Formwork and staging 20 per cent of (a+b+c)				9726.40	
		e) Overhead charges @ 0.25 on (a+b+c+d)				14589.60	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7294.80	
		Cost for 15 cum = a+b+c+d+e+f				80242.80	
		Rate per cum = (a+b+c+d+e+f)/15				5349.52	
						say	<b>5350.00</b>
14.1C Case I (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				48632.00	
		d) Formwork and staging 25 per cent of (a+b+c)				12158.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				15197.50	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7598.75	
		Cost for 15 cum = a+b+c+d+e+f				83586.25	
		Rate per cum = (a+b+c+d+e+f)/15				5572.42	
						say	<b>5572.00</b>
14.1C Case I (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				48632.00	
		d) Formwork and staging 30 per cent of (a+b+c)				14589.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				15805.40	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7902.70	
		Cost for 15 cum = a+b+c+d+e+f				86929.70	
		Rate per cum = (a+b+c+d+e+f)/15				5795.31	
						say	<b>5795.00</b>
14.1C Case I	(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 15 cum				48632.00	
		d) Formwork and staging 25 per cent of (a+b+c)				12158.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				15197.50	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7598.75	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 15 cum = a+b+c+d+e+f				83586.25	
		Rate per cum = (a+b+c+d+e+f)/15				5572.42	
					say	<u>5572.00</u>	
14.1C Case I (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				48632.00	
		d) Formwork and staging 30 per cent of (a+b+c)				14589.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				15805.40	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7902.70	
		Cost for 15 cum = a+b+c+d+e+f				86929.70	
		Rate per cum = (a+b+c+d+e+f)/15				5795.31	
					say	<u>5795.00</u>	
14.1C Case I (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				48632.00	
		d) Formwork and staging 35 per cent of (a+b+c)				17021.20	
		e) Overhead charges @ 0.25 on (a+b+c+d)				16413.30	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8206.65	
		Cost for 15 cum = a+b+c+d+e+f				90273.15	
		Rate per cum = (a+b+c+d+e+f)/15				6018.21	
					say	<u>6018.00</u>	
14.1C	Case II	Using Batching Plant, Transit Mixer and Concrete Pump.					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	48.79	5462.00	266490.98	M-081
		Coarse sand	cum	54.60	133.28	7277.09	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		b) Labour					
		Mate	day	0.88	171.00	150.48	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	19.00	157.00	2983.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	Lead =1 km & P&M-050
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<i>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</i>			<b>388293.00</b>		
		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				388293.00	
		d) Formwork and staging 20 per cent of (a+b+c)				77658.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				116487.90	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				58243.95	
		Cost for 120 cum = a+b+c+d+e+f				640683.45	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per cum = (a+b+c+d+e+f)/120				5339.03	
					say	<u>5339.00</u>	
14.1C Case II (j)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				388293.00	
		d) Formwork and staging 25 per cent of (a+b+c)				97073.25	
		e) Overhead charges @ 0.25 on (a+b+c+d)				121341.56	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				60670.78	
		Cost for 120 cum = a+b+c+d+e+f				667378.59	
		Rate per cum = (a+b+c+d+e+f)/120				5561.49	
					say	<u>5561.00</u>	
14.1C Case II (j)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				388293.00	
		d) Formwork and staging 30 per cent of (a+b+c)				116487.90	
		e) Overhead charges @ 0.25 on (a+b+c+d)				126195.23	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				63097.61	
		Cost for 120 cum = a+b+c+d+e+f				694073.74	
		Rate per cum = (a+b+c+d+e+f)/120				5783.95	
					say	<u>5784.00</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				388293.00	
		d) Formwork and staging 25 per cent of (a+b+c)				97073.25	
		e) Overhead charges @ 0.25 on (a+b+c+d)				121341.56	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				60670.78	
		Cost for 120 cum = a+b+c+d+e+f				667378.59	
		Rate per cum = (a+b+c+d+e+f)/120				5561.49	
					say	<u>5561.00</u>	
14.1C Case II (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				388293.00	
		d) Formwork and staging 30 per cent of (a+b+c)				116487.90	
		e) Overhead charges @ 0.25 on (a+b+c+d)				126195.23	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				63097.61	
		Cost for 120 cum = a+b+c+d+e+f				694073.74	
		Rate per cum = (a+b+c+d+e+f)/120				5783.95	
					say	<u>5784.00</u>	
14.1C Case II (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				388293.00	
		d) Formwork and staging 35 per cent of (a+b+c)				135902.55	
		e) Overhead charges @ 0.25 on (a+b+c+d)				131048.89	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				65524.44	
		Cost for 120 cum = a+b+c+d+e+f				720768.88	
		Rate per cum = (a+b+c+d+e+f)/120				6006.41	
					say	<u>6006.00</u>	
14.1	D	RCC/PSC Grade M35					
	Case I	Using Concrete Mixer.					
		Unit = 1 cum					
		Taking output = 15 cum					



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		a) Material					
		Cement	tonne	6.33	5462.00	34574.46	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		b) Labour					
		Mate	day	0.90	171.00	153.90	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	21.00	157.00	3297.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</b>			<b>49889.00</b>		
		For formwork and staging add the following:					
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				49889.00	
		d) Formwork and staging 18 per cent of (a+b+c)				8980.02	
		e) Overhead charges @ 0.25 on (a+b+c+d)				14717.26	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7358.63	
		Cost for 15 cum = a+b+c+d+e+f				80944.90	
		Rate per cum = (a+b+c+d+e+f)/15				5396.33	
						<b>say</b>	<b><u>5396.00</u></b>
14.1D Case I (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49889.00	
		d) Formwork and staging 23 per cent of (a+b+c)				11474.47	
		e) Overhead charges @ 0.25 on (a+b+c+d)				15340.87	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7670.43	
		Cost for 15 cum = a+b+c+d+e+f				84374.77	
		Rate per cum = (a+b+c+d+e+f)/15				5624.98	
						<b>say</b>	<b><u>5625.00</u></b>
14.1D Case I (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49889.00	
		d) Formwork and staging 28 per cent of (a+b+c)				13968.92	
		e) Overhead charges @ 0.25 on (a+b+c+d)				15964.48	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7982.24	
		Cost for 15 cum = a+b+c+d+e+f				87804.64	
		Rate per cum = (a+b+c+d+e+f)/15				5853.64	
						<b>say</b>	<b><u>5854.00</u></b>
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				49889.00	
		d) Formwork and staging 23 per cent of (a+b+c)				11474.47	
		e) Overhead charges @ 0.25 on (a+b+c+d)				15340.87	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7670.43	
		Cost for 15 cum = a+b+c+d+e+f				84374.77	
		Rate per cum = (a+b+c+d+e+f)/15				5624.98	
						<b>say</b>	<b><u>5625.00</u></b>

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.1D Case I (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49889.00	
		d) Formwork and staging 28 per cent of (a+b+c)				13968.92	
		e) Overhead charges @ 0.25 on (a+b+c+d)				15964.48	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				7982.24	
		Cost for 15 cum = a+b+c+d+e+f				87804.64	
		Rate per cum = (a+b+c+d+e+f)/15				5853.64	
					<i>say</i>	<u>5854.00</u>	
14.1D Case I (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49889.00	
		d) Formwork and staging 33 per cent of (a+b+c)				16463.37	
		e) Overhead charges @ 0.25 on (a+b+c+d)				16588.09	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8294.05	
		Cost for 15 cum = a+b+c+d+e+f				91234.51	
		Rate per cum = (a+b+c+d+e+f)/15				6082.30	
					<i>say</i>	<u>6082.00</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				49889.00	
		d) Formwork and staging 38 per cent of (a+b+c)				18957.82	
		e) Overhead charges @ 0.25 on (a+b+c+d)				17211.71	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8605.85	
		Cost for 15 cum = a+b+c+d+e+f				94664.38	
		Rate per cum = (a+b+c+d+e+f)/15				6310.96	
					<i>say</i>	<u>6311.00</u>	
14.1D Case I (iii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49889.00	
		d) Formwork and staging 48 per cent of (a+b+c)				23946.72	
		e) Overhead charges @ 0.25 on (a+b+c+d)				18458.93	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				9229.47	
		Cost for 15 cum = a+b+c+d+e+f				101524.12	
		Rate per cum = (a+b+c+d+e+f)/15				6768.27	
					<i>say</i>	<u>6768.00</u>	
14.1D Case I (iii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				49889.00	
		d) Formwork and staging 58 per cent of (a+b+c)				28935.62	
		e) Overhead charges @ 0.25 on (a+b+c+d)				19706.16	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				9853.08	
		Cost for 15 cum = a+b+c+d+e+f				108383.85	
		Rate per cum = (a+b+c+d+e+f)/15				7225.59	
					<i>say</i>	<u>7226.00</u>	
		Case II Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	50.64	5462.00	276595.68	M-081

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		<b>b) Labour</b>					
		Mate	day	0.88	171.00	150.48	L-12
		Mason	day	3.00	213.00	639.00	L-11
		Mazdoor	day	19.00	157.00	2983.00	L-13
		<b>c) Machinery</b>					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	Lead =1 km & P&M-050
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>		<b>398318.00</b>			
		For formwork and staging add the following:					
14.1D Case II	(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 120 cum				398318.00	
		d) Formwork and staging 18 per cent of (a+b+c)				71697.24	
		e) Overhead charges @ 0.25 on (a+b+c+d)				117503.81	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				58751.91	
		Cost for 120 cum = a+b+c+d+e+f				646270.96	
		Rate per cum = (a+b+c+d+e+f)/120				5385.59	
						<b>say</b>	<b>5386.00</b>
14.1D Case II (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				398318.00	
		d) Formwork and staging 23 per cent of (a+b+c)				91613.14	
		e) Overhead charges @ 0.25 on (a+b+c+d)				122482.79	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				61241.39	
		Cost for 120 cum = a+b+c+d+e+f				673655.32	
		Rate per cum = (a+b+c+d+e+f)/120				5613.79	
						<b>say</b>	<b>5614.00</b>
14.1D Case II (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				398318.00	
		d) Formwork and staging 28 per cent of (a+b+c)				111529.04	
		e) Overhead charges @ 0.25 on (a+b+c+d)				127461.76	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				63730.88	
		Cost for 120 cum = a+b+c+d+e+f				701039.68	
		Rate per cum = (a+b+c+d+e+f)/120				5842.00	
						<b>say</b>	<b>5842.00</b>
14.1D Case II	(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 120 cum				398318.00	
		d) Formwork and staging 23 per cent of (a+b+c)				91613.14	
		e) Overhead charges @ 0.25 on (a+b+c+d)				122482.79	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				61241.39	
		Cost for 120 cum = a+b+c+d+e+f				673655.32	
		Rate per cum = (a+b+c+d+e+f)/120				5613.79	
					say	<u>5614.00</u>	
14.1D Case II (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				398318.00	
		d) Formwork and staging 28 per cent of (a+b+c)				111529.04	
		e) Overhead charges @ 0.25 on (a+b+c+d)				127461.76	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				63730.88	
		Cost for 120 cum = a+b+c+d+e+f				701039.68	
		Rate per cum = (a+b+c+d+e+f)/120				5842.00	
					say	<u>5842.00</u>	
14.1D Case II (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				398318.00	
		d) Formwork and staging 33 per cent of (a+b+c)				131444.94	
		e) Overhead charges @ 0.25 on (a+b+c+d)				132440.74	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				66220.37	
		Cost for 120 cum = a+b+c+d+e+f				728424.04	
		Rate per cum = (a+b+c+d+e+f)/120				6070.20	
					say	<u>6070.00</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				398318.00	
		d) Formwork and staging 38 per cent of (a+b+c)				151360.84	
		e) Overhead charges @ 0.25 on (a+b+c+d)				137419.71	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				68709.86	
		Cost for 120 cum = a+b+c+d+e+f				755808.41	
		Rate per cum = (a+b+c+d+e+f)/120				6298.40	
					say	<u>6298.00</u>	
14.1D Case II (iii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				398318.00	
		d) Formwork and staging 48 per cent of (a+b+c)				191192.64	
		e) Overhead charges @ 0.25 on (a+b+c+d)				147377.66	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				73688.83	
		Cost for 120 cum = a+b+c+d+e+f				810577.13	
		Rate per cum = (a+b+c+d+e+f)/120				6754.81	
					say	<u>6755.00</u>	
14.1D Case II (iii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				398318.00	
		d) Formwork and staging 58 per cent of (a+b+c)				231024.44	
		e) Overhead charges @ 0.25 on (a+b+c+d)				157335.61	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				78667.81	
		Cost for 120 cum = a+b+c+d+e+f				865345.86	
		Rate per cum = (a+b+c+d+e+f)/120				7211.22	
					say	<u>7211.00</u>	
14.1	E	PSC Grade M-40					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Case 1					
		Using concrete mixer.					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 15 cum</i>					
		a) Material					
		Cement	tonne	6.45	5462.00	35229.90	M-081
		Coarse sand	cum	6.75	133.28	899.64	M-005
		20 mm Aggregate	cum	8.10	529.62	4289.92	M-053
		10 mm Aggregate	cum	5.40	589.97	3185.84	M-051
		Admixture @ 0.4 per cent of cement	kg	25.80	150.00	3870.00	M-180
		b) Labour					
		Mate	day	0.96	171.00	164.16	L-12
		Mason	day	2.00	213.00	426.00	L-11
		Mazdoor	day	22.00	157.00	3454.00	L-13
		c) Machinery					
		Concrete mixer (cap. 0.40/0.28 cum)	hour	6.00	58.00	348.00	P&M-009
		Generator 33 KVA	hour	6.00	470.00	2820.00	P&M-079
		<i>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 15 cum</i>		<b>54688.00</b>			
		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				54688.00	
		d) Formwork and staging 20 per cent of (a+b+c)				10937.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				16406.40	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8203.20	
		Cost for 15 cum = a+b+c+d+e+f				90235.20	
		Rate per cum = (a+b+c+d+e+f)/15				6015.68	
							<i>say</i> <b>6016.00</b>
14.1E Case I (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				54688.00	
		d) Formwork and staging 25 per cent of (a+b+c)				13672.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				17090.00	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8545.00	
		Cost for 15 cum = a+b+c+d+e+f				93995.00	
		Rate per cum = (a+b+c+d+e+f)/15				6266.33	
							<i>say</i> <b>6266.00</b>
14.1E Case I (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				54688.00	
		d) Formwork and staging 30 per cent of (a+b+c)				16406.40	
		e) Overhead charges @ 0.25 on (a+b+c+d)				17773.60	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8886.80	
		Cost for 15 cum = a+b+c+d+e+f				97754.80	
		Rate per cum = (a+b+c+d+e+f)/15				6516.99	
							<i>say</i> <b>6517.00</b>
14.1E Case I	(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 15 cum				54688.00	
		d) Formwork and staging 25 per cent of (a+b+c)				13672.00	
		e) Overhead charges @ 0.25 on (a+b+c+d)				17090.00	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8545.00	
		Cost for 15 cum = a+b+c+d+e+f				93995.00	
		Rate per cum = (a+b+c+d+e+f)/15				6266.33	
					<i>say</i>	<u>6266.00</u>	
14.1E Case I (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				54688.00	
		d) Formwork and staging 30 per cent of (a+b+c)				16406.40	
		e) Overhead charges @ 0.25 on (a+b+c+d)				17773.60	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				8886.80	
		Cost for 15 cum = a+b+c+d+e+f				97754.80	
		Rate per cum = (a+b+c+d+e+f)/15				6516.99	
					<i>say</i>	<u>6517.00</u>	
14.1E Case I (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 15 cum				54688.00	
		d) Formwork and staging 35 per cent of (a+b+c)				19140.80	
		e) Overhead charges @ 0.25 on (a+b+c+d)				18457.20	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				9228.60	
		Cost for 15 cum = a+b+c+d+e+f				101514.60	
		Rate per cum = (a+b+c+d+e+f)/15				6767.64	
					<i>say</i>	<u>6768.00</u>	
14.1E	Case II	Using Batching Plant, Transit Mixer and Concrete Pump					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	51.60	5462.00	281839.20	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		Admixture @ 0.4 per cent of cement	kg	206.40	150.00	30960.00	M-180
		b) Labour					
		Mate	day	0.94	171.00	160.74	L-12
		Mason	day	3.50	213.00	745.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	Lead =1 km & P&M-050
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<i>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</i>		434795.00			
		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					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				434795.00	
		d) Formwork and staging 18 per cent of (a+b+c)				78263.10	
		e) Overhead charges @ 0.25 on (a+b+c+d)				128264.53	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				64132.26	
		Cost for 15 cum = a+b+c+d+e+f				705454.89	
		Rate per cum = (a+b+c+d+e+f)/120				5878.79	
					say	<u>5879.00</u>	
14.1E Case II (j)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				434795.00	
		d) Formwork and staging 23 per cent of (a+b+c)				100002.85	
		e) Overhead charges @ 0.25 on (a+b+c+d)				133699.46	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				66849.73	
		Cost for 120 cum = a+b+c+d+e+f				735347.04	
		Rate per cum = (a+b+c+d+e+f)/120				6127.89	
					say	<u>6128.00</u>	
14.1E Case II (j)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				434795.00	
		d) Formwork and staging 28 per cent of (a+b+c)				121742.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				139134.40	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				69567.20	
		Cost for 120 cum = a+b+c+d+e+f				765239.20	
		Rate per cum = (a+b+c+d+e+f)/120				6376.99	
					say	<u>6377.00</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					
	(p)	Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				434795.00	
		d) Formwork and staging 23 per cent of (a+b+c)				100002.85	
		e) Overhead charges @ 0.25 on (a+b+c+d)				133699.46	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				66849.73	
		Cost for 120 cum = a+b+c+d+e+f				735347.04	
		Rate per cum = (a+b+c+d+e+f)/120				6127.89	
					say	<u>6128.00</u>	
14.1E Case II (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				434795.00	
		d) Formwork and staging 28 per cent of (a+b+c)				121742.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				139134.40	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				69567.20	
		Cost for 120 cum = a+b+c+d+e+f				765239.20	
		Rate per cum = (a+b+c+d+e+f)/120				6376.99	
					say	<u>6377.00</u>	
14.1E Case II (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				434795.00	
		d) Formwork and staging 33 per cent of (a+b+c)				143482.35	
		e) Overhead charges @ 0.25 on (a+b+c+d)				144569.34	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				72284.67	
		Cost for 120 cum = a+b+c+d+e+f				795131.36	
		Rate per cum = (a+b+c+d+e+f)/120				6626.09	
					say	<u>6626.00</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.					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		(p) Height upto 5m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				434795.00	
		d) Formwork and staging 38 per cent of (a+b+c)				165222.10	
		e) Overhead charges @ 0.25 on (a+b+c+d)				150004.28	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				75002.14	
		Cost for 120 cum = a+b+c+d+e+f				825023.51	
		Rate per cum = (a+b+c+d+e+f)/120				6875.20	
					say	<u>6875.00</u>	
14.1E Case II (iii)		(q) Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				434795.00	
		d) Formwork and staging 48 per cent of (a+b+c)				208701.60	
		e) Overhead charges @ 0.25 on (a+b+c+d)				160874.15	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				80437.08	
		Cost for 120 cum = a+b+c+d+e+f				884807.83	
		Rate per cum = (a+b+c+d+e+f)/120				7373.40	
						say	<u>7373.00</u>
14.1E Case II (iii)		(r) Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				434795.00	
		d) Formwork and staging 58 per cent of (a+b+c)				252181.10	
		e) Overhead charges @ 0.25 on (a+b+c+d)				171744.03	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				85872.01	
		Cost for 120 cum = a+b+c+d+e+f				944592.14	
		Rate per cum = (a+b+c+d+e+f)/120				7871.60	
						say	<u>7872.00</u>
14.1F	F	PSC Grade M-45					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	55.80	5462.00	304779.60	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		Admixture @ 0.4 per cent of cement	kg	223.20	150.00	33480.00	M-180
		b) Labour					
		Mate	day	0.94	171.00	160.74	L-12
		Mason	day	3.50	213.00	745.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	Lead =1 km & P&M-050
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<b>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</b>			<b>460256.00</b>		
		For formwork and staging add the following:					



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
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				460256.00	
		d) Formwork and staging 16 per cent of (a+b+c)				73640.96	
		e) Overhead charges @ 0.25 on (a+b+c+d)				133474.24	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				66737.12	
		Cost for 120 cum = a+b+c+d+e+f				734108.32	
		Rate per cum = (a+b+c+d+e+f)/120				6117.57	
					say	<u>6118.00</u>	
14.1F (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				460256.00	
		d) Formwork and staging 21 per cent of (a+b+c)				96653.76	
		e) Overhead charges @ 0.25 on (a+b+c+d)				139227.44	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				69613.72	
		Cost for 120 cum = a+b+c+d+e+f				765750.92	
		Rate per cum = (a+b+c+d+e+f)/120				6381.26	
					say	<u>6381.00</u>	
14.1F (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				460256.00	
		d) Formwork and staging 26 per cent of (a+b+c)				119666.56	
		e) Overhead charges @ 0.25 on (a+b+c+d)				144980.64	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				72490.32	
		Cost for 120 cum = a+b+c+d+e+f				797393.52	
		Rate per cum = (a+b+c+d+e+f)/120				6644.95	
					say	<u>6645.00</u>	
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				460256.00	
		d) Formwork and staging 21 per cent of (a+b+c)				96653.76	
		e) Overhead charges @ 0.25 on (a+b+c+d)				139227.44	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				69613.72	
		Cost for 120 cum = a+b+c+d+e+f				765750.92	
		Rate per cum = (a+b+c+d+e+f)/120				6381.26	
					say	<u>6381.00</u>	
14.1F (ii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				460256.00	
		d) Formwork and staging 26 per cent of (a+b+c)				119666.56	
		e) Overhead charges @ 0.25 on (a+b+c+d)				144980.64	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				72490.32	
		Cost for 120 cum = a+b+c+d+e+f				797393.52	
		Rate per cum = (a+b+c+d+e+f)/120				6644.95	
					say	<u>6645.00</u>	
14.1F (ii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				460256.00	
		d) Formwork and staging 31 per cent of (a+b+c)				142679.36	
		e) Overhead charges @ 0.25 on (a+b+c+d)				150733.84	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				75366.92	
		Cost for 120 cum = a+b+c+d+e+f				829036.12	
		Rate per cum = (a+b+c+d+e+f)/120				6908.63	
					say	<u>6909.00</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				460256.00	
		d) Formwork and staging 36 per cent of (a+b+c)				165692.16	
		e) Overhead charges @ 0.25 on (a+b+c+d)				156487.04	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				78243.52	
		Cost for 120 cum = a+b+c+d+e+f				860678.72	
		Rate per cum = (a+b+c+d+e+f)/120				7172.32	
					say	<u>7172.00</u>	
14.1F (iii)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				460256.00	
		d) Formwork and staging 46 per cent of (a+b+c)				211717.76	
		e) Overhead charges @ 0.25 on (a+b+c+d)				167993.44	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				83996.72	
		Cost for 120 cum = a+b+c+d+e+f				923963.92	
		Rate per cum = (a+b+c+d+e+f)/120				7699.70	
					say	<u>7700.00</u>	
14.1F (iii)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				460256.00	
		d) Formwork and staging 56 per cent of (a+b+c)				257743.36	
		e) Overhead charges @ 0.25 on (a+b+c+d)				179499.84	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				89749.92	
		Cost for 120 cum = a+b+c+d+e+f				987249.12	
		Rate per cum = (a+b+c+d+e+f)/120				8227.08	
					say	<u>8227.00</u>	
14.1	G	PSC Grade M-50					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	58.80	5462.00	321165.60	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		Admixture @ 0.4 per cent of cement	kg	235.20	150.00	35280.00	M-180
		b) Labour					
		Male	day	0.94	171.00	160.74	L-12
		Mason	day	3.50	213.00	745.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	Lead =1 km & P&M-050

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<i>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</i>		478442.00			
		For formwork and staging add the following:					
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				478442.00	
		d) Formwork and staging 35 per cent of (a+b+c)				167454.70	
		e) Overhead charges @ 0.25 on (a+b+c+d)				161474.18	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				80737.09	
		Cost for 120 cum = a+b+c+d+e+f				888107.96	
		Rate per cum = (a+b+c+d+e+f)/120				7400.90	
					say	<u>7401.00</u>	
14.1G (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				478442.00	
		d) Formwork and staging 45 per cent of (a+b+c)				215298.90	
		e) Overhead charges @ 0.25 on (a+b+c+d)				173435.23	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				86717.61	
		Cost for 120 cum = a+b+c+d+e+f				953893.74	
		Rate per cum = (a+b+c+d+e+f)/120				7949.11	
					say	<u>7949.00</u>	
14.1G (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				478442.00	
		d) Formwork and staging 55 per cent of (a+b+c)				263143.10	
		e) Overhead charges @ 0.25 on (a+b+c+d)				185396.28	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				92698.14	
		Cost for 120 cum = a+b+c+d+e+f				1019679.51	
		Rate per cum = (a+b+c+d+e+f)/120				8497.33	
					say	<u>8497.00</u>	
14.1	H	PSC Grade M- 55					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 120 cum</i>					
		a) Material					
		Cement	tonne	63.50	5462.00	346837.00	M-081
		Coarse sand	cum	54.00	133.28	7197.12	M-004
		20 mm Aggregate	cum	64.80	529.62	34319.38	M-053
		10 mm Aggregate	cum	43.20	589.97	25486.70	M-051
		Admixture @ 0.4 per cent of cement	kg	254.00	150.00	38100.00	M-180
		b) Labour					
		Mate	day	0.94	171.00	160.74	L-12
		Mason	day	3.50	213.00	745.50	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Batching Plant @ 20 cum/hour	hour	6.00	2325.00	13950.00	P&M-002
		Generator 100 KVA	hour	6.00	1532.00	9192.00	P&M-080
		Loader	hour	6.00	1071.00	6426.00	P&M-017
		Transit Mixer ( capacity 4.0 cu.m )					
		Transit Mixer 4 cum capacity lead upto1 Km	hour	15.00	1176.00	17640.00	P&M-049
		Lead beyond 1 Km, L - lead in Kilometer	tonne.km	300L	6.00	1800.00	Lead =1 km & P&M-050

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Concrete Pump	hour	6.00	323.00	1938.00	P&M-007
		<i>Basic Cost of Labour, Material &amp; Machinery (a+b+c) for 120 cum</i>		506933.00			
		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				506933.00	
		d) Formwork and staging 35 per cent of (a+b+c)				177426.55	
		e) Overhead charges @ 0.25 on (a+b+c+d)				171089.89	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				85544.94	
		Cost for 120 cum = a+b+c+d+e+f				940994.38	
		Rate per cum = (a+b+c+d+e+f)/120				7841.62	
					say	<u>7842.00</u>	
14.1H (i)	(q)	Height 5m to 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				506933.00	
		d) Formwork and staging 45 per cent of (a+b+c)				228119.85	
		e) Overhead charges @ 0.25 on (a+b+c+d)				183763.21	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				91881.61	
		Cost for 120 cum = a+b+c+d+e+f				1010697.67	
		Rate per cum = (a+b+c+d+e+f)/120				8422.48	
					say	<u>8422.00</u>	
14.1H (i)	(r)	Height above 10m					
		Basic Cost of Labour, Material & Machinery (a+b+c) for 120 cum				506933.00	
		d) Formwork and staging 55 per cent of (a+b+c)				278813.15	
		e) Overhead charges @ 0.25 on (a+b+c+d)				196436.54	
		f) Contractor's profit @ 0.1 on (a+b+c+d+e)				98218.27	
		Cost for 120 cum = a+b+c+d+e+f				1080400.96	
		Rate per cum = (a+b+c+d+e+f)/120				9003.34	
					say	<u>9003.00</u>	
	Note	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					
		<i>Unit = 1 MT</i>					
		<i>Taking output = 1 MT</i>					
		a) Material					
		HYSD bars including 5 per cent for laps and wastage	tonne	1.05	42812.50	44953.13	M-082
		Binding wire	Kg	8.00	53.85	430.80	M-072
		b) Labour for cutting, bending, tying and placing in position					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate	day	0.44	171.00	75.24	L-12
		Blacksmith	day	3.00	213.00	639.00	L-02a
		Mazdoor	day	8.00	157.00	1256.00	L-13
		<b>Basic Cost of Labour &amp; Material (a+b)</b>		<b>47355.00</b>			
		c) Overhead charges @ 0.25 on (a+b)				11838.54	
		d) Contractor's profit @ 0.1 on (a+b+c)				5919.27	
		Rate per MT = a+b+c+d				65111.98	
					<b>say</b>	<b><u>65112.00</u></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					
		<b>Unit = 1 MT</b>					
		<b>Taking output = 0.377 MT</b>					
		Details of cost for 12T13 strand 40 m long cable (weight = 0.377 MT)					
		a) Material					
		H.T. Strand @ 9.42 kg/m including 2 per cent for wastage and extra length for jacking	tonne	0.385	66566.75	25628.20	M-119
		Sheathing duct ID 66 mm along with 5 per cent extra length 40 x 1.05 = 42 m.	metre	42.00	82.50	3465.00	M-165
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	2.00	45.00	90.00	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	5462.00	682.75	M-081
		Add 0.50 per cent cost of material for Spacers, Insulation tape and miscellaneous items				149.33	
		b) Labour					
		i) For making and fixing cables, anchorages					
		Mate	day	0.16	171.00	27.36	L-12
		Blacksmith	day	1.00	213.00	213.00	L-02a
		Mazdoor	day	3.00	157.00	471.00	L-13
		ii) For prestressing					
		Mate/Supervisor	day	0.05	171.00	8.55	L-12
		Prestressing operator / Fitter	day	0.25	216.00	54.00	L-08
		Mazdoor	day	1.00	157.00	157.00	L-13
		iii) For grouting					
		Mate/Supervisor	day	0.05	171.00	8.55	L-12
		Mason	day	0.25	213.00	53.25	L-11
		Mazdoor	day	1.00	157.00	157.00	L-13
		c) Machinery					
		Stressing jack with pump	hour	2.50	163.00	407.50	P&M-040
		Grouting pump with agitator	hour	1.00	150.00	150.00	M-111
		Generator 33 KVA.	hour	3.50	470.00	1645.00	P&M-079
		d) Overhead charges @ 0.25 on (a+b+c)				8341.87	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				4170.94	
		Cost for 0.377 MT (a+b+c+d+e)				45880.30	
		Rate per MT = (a+b+c+d+e)/0.377				121698.40	
					<b>say</b>	<b><u>121698.00</u></b>	
		Note					Cost of HT steel has been taken for delivery at site. Hence carriage has not been considered.
14.4	2702	Providing and laying Cement concrete wearing coat M-30 grade including reinforcement complete as per drawing and Technical Specifications					
		<b>Unit = 1 cum</b>					
		<b>Taking output = 1 cum</b>					
		a) Material					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cement concrete M30 Grade Refer relevant item of concrete in Item 14.1 excluding formwork	cum	1.00	3238.00	3238.00	Item 14.1(C) case II
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.075	47355.00	3551.63	Item 14.2 A
		b) Labour					DIR used item
		Mazdoor for cleaning deck slab concrete surface.	day	0.15	157.00	23.55	L-13
		c) Overhead charges @ 0.25 on (a+b)				1703.29	
		d) Contractor's profit @ 0.1 on (a+b+c)				851.65	
		Rate per cum (a+b+c+d)				9368.12	
					say	<u>9368.00</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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 72.46 sqm (2 tonnes)(0.869 cum) assuming a density of 2.3 tonnes/cum.</i>					
		a) Labour					
		Mate	day	0.49	171.00	83.79	L-12
		Mazdoor	day	11.00	157.00	1727.00	L-13
		Mazdoor (Skilled)	day	1.25	200.00	250.00	L-15
		b) Machinery					
		Mechanical broom @ 1250 sqm per hour	hour	0.06	422.00	25.32	P&M-031
		Air compressor 250 cfm	hour	0.06	405.00	24.30	P&M-001
		Mastic cooker 1 tonne capacity	hour	6.00	78.00	468.00	P&M-030
		Bitumen boiler 1500 litres capacity	hour	6.00	251.00	1506.00	P&M-005
		Tractor for towing and positioning of mastic cooker and bitumen boiler	hour	1.00	459.00	459.00	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 CRRRI 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	51378.00	10481.11	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	92.57	36.10	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	3069.00	1104.84	M-188
		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	589.97	324.48	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	617.12	22.22	M-142

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		vi) Bitumen for coating of chips @ 2 per cent by weight = $0.036 \times 1.456 \times 2/100 = 0.001048MT = 1.05kg$	kg	1.05	51.38	53.95	M-197/1000
		d) Overhead charges @ 0.25 on (a+b+c)				4141.53	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				2070.76	
		Cost for 72.46 sqm = a+b+c+d+e				22778.40	
		Rate per sqm = (a+b+c+d+e)/72.46				314.36	
					<i>say</i>	<u>314.00</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.					
		<i>Unit = 1 RM</i>					
		<i>Taking output = 2 x 24 m span = 48 m</i>					
		a) Material					
		i) M30 Grade Reinforced Cement Concrete	cum	4.092	3238.00	13249.90	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.				662.49	
		ii) HYSB bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.865	47355.00	40962.08	Item 14.2 A
		Refer MoRTH SD / 202.					DIR used item
		Add 5 per cent of (a) for handling and fixing of precast panels in position				2743.72	
		b) Overhead charges @ 0.25 on (a)				14404.55	
		c) Contractor's profit @ 0.1 on (a+b)				7202.27	
		Rate for 48 m (a+b+c)				79225.01	
		Rate per metre (a+b+c)/48				1650.52	
					<i>say</i>	<u>1651.00</u>	
		<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.					

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
14.7	2703, 1500, 1600 & 1700	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.					
		<i>Unit = 1 RM</i>					
		<i>Taking output = 2 x 24 m span = 48 m.</i>					
		a) Material					
		i) M30 Grade Reinforced Cement Concrete	cum	4.092	3238.00	13249.90	Item 14.1(C) case II
		No. of vertical posts = (12 + 2)2 = 28 Nos., External area of vertical post 0.25x0.275 = 0.069sqm, Concrete in vehicle posts = 0.069 x 28 = 1.932 cum, Hand rail in 3 tiers = 3 x 24 = 72 m, External area = 0.170 x 0.175 = 0.03 sqm, Concrete in hand rails = 0.03 x 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.				1589.99	
		ii) HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.865	47355.00	40962.08	Item 14.2 A
		refer MoRTH SD / 202.					
		b) Overhead charges @ 0.25 on (a)				13950.49	
		c) Contractor's profit @ 0.1 on (a+b)				6975.24	
		Rate for 48 m (a+b+c)				76727.69	
		Rate per metre (a+b+c)/48				1598.49	
					<i>say</i>	<u>1598.00</u>	
		Note					
		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	Providing, fitting and fixing mild steel railing complete as per drawing and Technical Specification					
		<i>Unit = 1 RM</i>					
		<i>Taking output = 2 x 50 m span = 100 m</i>					
		a) Material:					
		1) ISMC 100 = 2.806 x 1.05 = 2.946 MT	tonne	2.946	44879.36	132214.59	M-179
		2) MS Flat = 0.964 x 1.05 = 1.012 MT	tonne	1.012	44879.36	45417.91	M-179
		3) MS bars = 0.17 x 1.05 = 0.180 MT	tonne	0.18	44879.36	8078.28	M-179
		4) MS bolts, nuts and washers	tonne	0.15	58030.00	8704.50	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.				9720.76	
		Add for cost of concrete for fixing vertical posts in the performed recess @ 1 per cent of cost of material.				1944.15	
		Add for electricity charges, welding and drilling equipment, electrodes and other consumables @ 1 per cent of cost of material.				1944.15	
		b) Labour					
		Mate	day	2.80	171.00	478.80	L-12
		Mazdoor (Skilled)	day	30.00	200.00	6000.00	L-15
		Mazdoor	day	40.00	157.00	6280.00	L-13
		c) Overhead charges @ 0.25 on (a+b)				55195.79	
		d) Contractor's profit @ 0.1 on (a+b+c)				27597.90	
		Cost for 100 m steel railing = a+b+c+d				303576.85	
		Rate per metre (a+b+c+d)/100				3035.77	



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
					<i>say</i>	<u>3036.00</u>	
14.9	2705	Drainage Spouts complete as per drawing and Technical specification					
		<i>Unit = 1 No.</i>					
		<i>Taking output = 1 No.</i>					
		a) Material					
		Corrosion resistant Structural steel including 5 per cent wastage	Kg	4.00	43.33	173.31	M-087/1000
		GI pipe 100mm dia	metre	6.00	44.72	268.32	M-056
		GI bolt 10 mm Dia	each	6.00	15.00	90.00	M-110
		Galvanised MS flat clamp	each	2.00	14.87	29.74	M-101
		b) Labour					
		For fabrication					
		Mate	day	0.02	171.00	3.42	L-12
		Skilled (Blacksmith, welder etc.)	day	0.02	213.00	4.26	L-02a
		Mazdoor	day	0.02	157.00	3.14	L-13
		For fixing in position					
		Mate	day	0.01	171.00	1.71	L-12
		Mason	day	0.01	213.00	2.13	L-11
		Mazdoor	day	0.20	157.00	31.40	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.				30.37	
		c) Overhead charges @ 0.25 on (a+b)				159.45	
		d) Contractor's profit @ 0.1 on (a+b+c)				79.72	
		<b>Rate per No. (a+b+c+d)</b>				876.97	
					<i>say</i>	<u>877.00</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					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Concrete, Rate as per item No. 12.8 (A) excluding formworks	cum	1.00	2611.00	2611.00	Item 12.8 (A)
		b) Overhead charges @ 0.25 on (a)				652.75	
		c) Contractor's profit @ 0.1 on(a+b)				326.38	
		Rate per cum (a+b+c)				3590.13	
		Rate per cum			<i>say</i>	<u>3590.00</u>	
14.11	1500,160,1700 & 2704	Reinforced cement concrete approach slab including reinforcement and formwork complete as per drawing and Technical specification					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Cement concreteM30 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	3235.00	3235.00	Item 12.8 (G)

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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.				64.70	
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.05	47355.00	2367.75	Item 14.2 A
		b) Overhead charges @ 0.25 on (a)				1416.86	
		c) Contractor's profit @ 0.1 on(a+b)				708.43	
		Rate per cum (a+b+c)				7792.74	
					<i>say</i>	<u>7793.00</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)					
		<i>Unit = 1 MT</i>					
		<i>Taking output = 1 MT</i>					
		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					
		<i>Unit = 1 cum</i>					
		<i>Taking output = 1 cum</i>					
		Grade of concrete - M40					
		<b>a) Material</b>					
		Cement	tonne	0.47	5462.00	2567.14	M-081
		Coarse sand	cum	0.45	133.28	59.98	M-004
		20 mm Aggregate	cum	0.54	529.62	285.99	M-053
		10 mm Aggregate	cum	0.36	589.97	212.39	M-051
		Admixture @ 0.4 per cent of cement	Kg	1.88	150.00	282.00	M-180
		HYSD steel .	tonne	0.10	42812.50	4281.25	M-082
		HT strand with 5 per cent as wastage and extra length for anchoring	tonne	0.06	66566.75	3994.01	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>b) Labour</b>					
		(i) Cutting, bending, making reinforcement cage, placing in position, binding etc. complete					
		<i>Taking quantity of steel 100 Kg/cum of concrete including laps and wastage</i>					
		Mate	day	0.06	171.00	10.26	L-12
		Mazdoor (Skilled)	day	0.35	200.00	70.00	L-15
		Mazdoor	day	1.40	157.00	219.80	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.					
		<i>Taking quantity of HT strand 60 Kg/cum</i>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate	day	0.02	171.00	3.42	L-12
		Mazdoor (Skilled)	day	0.14	200.00	28.00	L-15
		Mazdoor	day	0.50	157.00	78.50	L-13
		(iii) Erection and dismantling of shuttering					
		<i>Taking shuttering area 10 sqm/cum of concrete</i>					
		Mate	day	0.12	171.00	20.52	L-12
		Mazdoor (Skilled)	day	1.00	200.00	200.00	L-15
		Mazdoor	day	2.00	157.00	314.00	L-13
		(iv) Concreting by Batching plant and stationary concrete pump					
		Mate	day	0.03	171.00	5.13	L-12
		Mazdoor (Skilled)	day	0.05	200.00	10.00	L-15
		Mazdoor	day	0.60	157.00	94.20	L-13
		(v) Steam curing and manual curing					
		Mate	day	0.01	171.00	1.71	L-12
		Mazdoor	day	0.35	157.00	54.95	L-13
		(vi) Handling of precast girder, stacking in stockyard and again loading in trailer					
		Mate	day	0.01	171.00	1.71	L-12
		Mazdoor	day	0.25	157.00	39.25	L-13
		(vii) Placement of girders in position over pier caps including placement of sand jacks, channel, levelling etc.					
		Mate	day	0.01	171.00	1.71	L-12
		Mazdoor (Skilled)	day	0.06	200.00	12.00	L-15
		Mazdoor	day	0.24	157.00	37.68	L-13
		c) Machinery					
		i) At casting yard					
		Generator 100 KVA	hour	0.05	1532.00	76.60	P&M-080
		Batching Plant @ 20 cum/hour	hour	0.05	2325.00	116.25	P&M-002
		Transit Mixer 4 cum capacity	hour	0.10	1176.00	117.60	P&M-049
		Concrete Pump stationary	hour	0.05	323.00	16.15	P&M-007
		Crane 35 tonne capacity	hour	0.10	1079.00	107.90	P&M-012
		Trailer 30 tonne capacity	hour	0.10	3136.00	313.60	P&M-089
		Loader	hour	0.05	1071.00	53.55	P&M-017
		ii) For transportation and placement at site					
		Crane 35 tonne capacity	hour	0.15	1079.00	161.85	P&M-012
		Trailer 30 tonne capacity for transporting to site.	tonne.km	2.5xL	3.00	7.50	Lead =1 km & P&M-090
		(L - Lead in Kilometer)					
		Trailer 30 tonne capacity during placement.	hour	0.15	3136.00	470.40	P&M-089
		Cost of formwork, steam curing arrangement, pretensioning arrangement etc @ 5 per cent of cost material, labour and machinery				#VALUE!	
		d) Overhead charges @ 0.25 on (a+b+c)				#VALUE!	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				#VALUE!	
		Rate per cum = (a+b+c+d+e)				#VALUE!	
					say	#VALUE!	
14.14	1700 & 1800	Providing and fixing Helical pipes in voided concrete slabs					
		<i>Unit = 1 RM</i>					
		<i>Taking output = 1 RM</i>					
		a) Material					
		Helical pipes 600mm diameter	metre	1.00	input	#VALUE!	M-117
		Tie rods 20mm diameter	each	1.00	input	#VALUE!	M-183

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Consumables for sealing joints etc.@ 5 per cent of cost of material				#VALUE!	
		b) Labour					
		Mate	day	0.01	171.00	1.71	L-12
		Fitter	day	0.05	216.00	10.80	L-08
		Mazdoor	day	0.20	157.00	31.40	L-13
		c) Overhead charges @ 0.25 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Rate per cum (a+b+c+d)				#VALUE!	
					say	<u>#VALUE!</u>	
14.15	800	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.	Per m			VALUE	
14.16	800	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 sqm.					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		a) Labour					
		Mate	day	0.01	171.00	1.71	L-12
		Painter	day	0.25	201.00	50.25	L-18
		Mazdoor (Skilled)	day	0.25	200.00	50.00	L-15
		b) Material					
		Water based paint of approved quality for cement concrete surface	Litres	5.00	110.85	554.25	M-190
		c) Overhead charges @ 0.25 on (a+b)				164.05	
		d) Contractor's profit @ 0.1 on (a+b+c)				82.03	
		Cost for 10 sqm (a+b+c+d)				902.29	
		Rate per sqm (a+b+c+d)/10				90.23	
					say	<u>90.00</u>	
14.17	2604	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.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		a) Labour					
		Mate	day	0.02	171.00	3.42	L-12
		Mazdoor	day	0.40	157.00	62.80	L-13
		Mazdoor (Skilled)	day	0.20	200.00	40.00	L-15
		b) Material					
		Galvanised M.S plate 200 mm wide, 12 mm thick @ 94.20 kg/sqm including 5 per cent wastage	kg	237.50	36.00	8550.00	M-060/1000
		Add 1 per cent of cost of steel plate cutting, welding consumables and galvanised nails.				85.50	
		c) Overhead charges @ 0.25 on (a+b)				2185.43	
		d) Contractor's profit @ 0.1 on (a+b+c)				1092.72	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Cost for 12 m = (a+b+c+d)				12019.87	
		Rate per m = (a+b+c+d)/12				1001.66	
					<i>say</i>	<u>1002.00</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	<b>Filler joint</b>					
		(i) Providing & fixing 2 mm thick corrugated copper plate in expansion joint complete as per drawing & Technical Specification.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		<b>a) Labour</b>					
		Cutting, bending, carrying & fixing etc.					
		Mate	day	0.04	171.00	6.84	L-12
		Mazdoor	day	0.50	157.00	78.50	L-13
		Mazdoor (Skilled)	day	0.50	200.00	100.00	L-15
		<b>b) Material</b>					
		Copper plate - 12m long x 250 mm wide	kg	55.00	690.13	37956.88	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 @ 0.25 on (a+b)				9535.55	
		d) Contractor's profit @ 0.1 on (a+b+c)				4767.78	
		Cost for 12 m = (a+b+c+d)				52445.55	
		Rate per m = (a+b+c+d)/12				4370.46	
					<i>say</i>	<u>4370.00</u>	
14.18		(ii) Providing & fixing 20 mm thick compressible fibre board in expansion joint complete as per drawing & Technical Specification.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		<b>a) Labour</b>					
		For carrying, placing & fixing.					
		Mate	day	0.008	171.00	1.37	L-12
		Mazdoor	day	0.10	157.00	15.70	L-13
		Mazdoor (Skilled)	day	0.10	200.00	20.00	L-15
		<b>b) Material</b>					
		20 mm thick compressible fibre board 12 m long x 25 cm deep.	sqm	3.00	801.00	2403.00	M-084
		Area = 12 x 0.25 = 3 sqm					
		c) Overhead charges @ 0.25 on (a+b)				610.02	
		d) Contractor's profit @ 0.1 on (a+b+c)				305.01	
		Cost for 12 m = (a+b+c+d)				3355.09	
		Rate per m = (a+b+c+d)/12				279.59	
					<i>say</i>	<u>280.00</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.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		<b>a) Labour</b>					
		Mate	day	0.01	171.00	1.71	L-12

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor	day	0.20	157.00	31.40	L-13
		Mazdoor (Skilled)	day	0.10	200.00	20.00	L-15
		b) Material					
		Premoulded joint filler 12 m long, 20 mm thick and 300 mm deep.	sqm	3.60	937.50	3375.00	M-141
		c) Overhead charges @ 0.25 on (a+b)				857.03	
		d) Contractor's profit @ 0.1 on (a+b+c)				428.51	
		Cost for 12 m = (a+b+c+d)				4713.65	
		Rate per m = (a+b+c+d)/12				392.80	
					<i>say</i>	<u>393.00</u>	
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					
		a) Labour					
		Mate	day	0.02	171.00	3.42	L-12
		Mazdoor	day	0.50	157.00	78.50	L-13
		Mazdoor (Skilled)	day	0.10	200.00	20.00	L-15
		b) Material					
		Sand	cum	0.012	133.28	1.60	M-005
		Volume 12 x 0.1 x 0.01 = 0.012 cum					
		Weight 0.012 x 1400 = 16.8kg					
		Bitumen	cum	0.001	48460.30	48.46	M-074
		16.8 x 0.06 = 1 kg					
		c) Overhead charges @ 0.25 on (a+b)				37.99	
		d) Contractor's profit @ 0.1 on (a+b+c)				19.00	
		Cost for 12 m = (a+b+c+d)				208.97	
		Rate per m = (a+b+c+d)/12				17.41	
					<i>say</i>	<u>17.40</u>	
		Note					
		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	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.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		a) Labour					
		Mate	day	0.052	171.00	8.89	L-12
		Mazdoor	day	1.00	157.00	157.00	L-13
		Mazdoor (Skilled)	day	0.30	200.00	60.00	L-15
		b) Material					
		Crushed stone aggregate 12.5 mm nominal size	cum	0.75	617.12	462.84	M-052
		Polymer modified bitumen	kg	77.50	48.56	3763.66	M-078/ 1000

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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	43.29	4891.77	M-103
		Add 1 per cent for welding and foam caulking/backer rod and other incidentals.				93.44	
		<b>c) Machinery</b>					
		Mastic cooker 1 tonne capacity	hour	1.00	78.00	78.00	P&M-030
		Smooth 3-wheeled steel roller 8-10 capacity	hour	0.50	604.00	302.00	P&M-044
		<b>d) Overhead charges @ 0.25 on (a+b+c)</b>				2454.40	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1227.20	
		Cost for 12 m asphalt plug joint = (a+b+c+d+e)				13499.20	
		Rate per m = (a+b+c+d+e)/12				1124.93	
					<i>say</i>	<u>1125.00</u>	
		<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	171.00	10.26	L-12
		Mazdoor	day	1.00	157.00	157.00	L-13
		Mazdoor (Skilled)	day	0.50	200.00	100.00	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	25725.00	308700.00	M-093
		Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals.				15435.00	
		<b>c) Overhead charges @ 0.25 on (a+b)</b>				81100.57	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				40550.28	
		Cost for 12 m = (a+b+c+d)				446053.11	
		Rate per m = (a+b+c+d)/12				37171.09	
					<i>say</i>	<u>37171.00</u>	
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	171.00	6.16	L-12

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor	day	0.60	157.00	94.20	L-13
		Mazdoor (Skilled)	day	0.30	200.00	60.00	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	43.29	19307.34	M-103
		Add 5 per cent of cost of above for structural steel for anchorage, welding and other incidentals.				973.38	
		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 @ 0.25 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!	
					<i>say</i>	<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	171.00	8.55	L-12
		Mazdoor	day	1.00	157.00	157.00	L-13
		Mazdoor (Skilled)	day	0.25	200.00	50.00	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	7980.95	95771.40	M-178
		Add 5 per cent of cost of material for anchorage reinforcement, welding and other incidentals (a+b)				4799.35	
		<b>c) Overhead charges @ 0.25 on (a+b)</b>				25196.57	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				12598.29	
		Cost for 12 m = (a+b+c+d)				138581.16	
		<b>Rate per m = (a+b+c+d)/12</b>				11548.43	
					<i>say</i>	<u>11548.00</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 Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		a) Labour					
		Mate	day	0.056	171.00	9.58	L-12
		Mazdoor	day	1.00	157.00	157.00	L-13
		Mazdoor (Skilled)	day	0.40	200.00	80.00	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	28350.00	340200.00	M-127
		c) Overhead charges @ 0.25 on (a+b)				85111.64	
		d) Contractor's profit @ 0.1 on (a+b+c)				42555.82	
		Cost for 12 m Modular strip/box seal joint = (a+b+c+d)				468114.04	
		Rate per m = (a+b+c+d)/12				39009.50	
					<i>say</i>	<u>39010.00</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.					
		3. The anchoring bars of the expansion joint assembly shall be welded to the main reinforcement of the deck.					
14.24	2600	<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.					
		<i>Unit = Running meter</i>					
		<i>Taking output = 12 m</i>					
		a) Labour					
		Mate	day	0.07	171.00	11.97	L-12
		Mazdoor	day	1.25	157.00	196.25	L-13
		Mazdoor (Skilled)	day	0.50	200.00	100.00	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 @ 0.25 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!	
					<i>say</i>	<u>#VALUE!</u>	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.		Description	Unit	Quantity	Rate Rs	Cost Rs	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.					

## 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.

## Summary of Rate Analysis

### CHAPTER-15 RIVER TRAINING AND PROTECTION WORKS

Item No.	Descriptions	Unit	Rate (in Rs.)
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>		
<b>A</b>	<b>Boulder laid dry without wire crates.</b>	cum	759.00
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	1186.00
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	3808.00
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>		
<b>A</b>	<b>Stone/Boulder</b>	cum	759.00
<b>B</b>	<b>Cement Concrete blocks of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15</b>	cum	3808.00
15.5	<b>Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification</b>	cum	943.00
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>		
<b>A</b>	<b>Rubble stone laid in cement mortar 1:3</b>	cum	3250.00
<b>B</b>	<b>Cement Concrete blocks Grade M15</b>	cum	5015.00
15.9	<b>Dry rubble Flooring</b>	cum	984.00
15.10	<b>Curtain wall complete as per drawing and Technical specification</b>		
<b>A</b>	<b>Stone masonry in cement mortar (1:3)</b>	cum	2680.00
<b>B</b>	<b>Cement concrete Grade M15</b>	cum	3733.00
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	794.00
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	1245.00
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	2026.00

## Analysis of Rate

### CHAPTER - 15 RIVER TRAINING AND PROTECTION WORKS

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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.					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Stone	cum	1.00	294.26	294.26	M-003
		Stone Spalls	cum	0.20	294.26	58.85	M-008
		b) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mason	day	0.35	213.00	74.55	L-11
		Mazdoor *	day	0.75	157.00	117.75	L-13
		c) Overhead charges @ 0.25 on (a+b)				138.06	
		d) Contractor's profit @ 0.1 on (a+b+c)				69.03	
		Rate per cum = (a+b+c+d)				759.35	
					<i>say</i>	<u>759.00</u>	
	*	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.					
		<i>Unit = cum</i>					
		<i>Taking output = 3 mx1.5mx1.25m = 5.63 cum</i>					
		a) Material					
		4mm GI wire crates woven in mesh size of 100 mm x 100 mm.	sqm	22.00	93.91	2065.93	M-102
		Stone	cum	5.63	294.26	1656.68	M-003
		Stone Spalls	cum	1.13	294.26	332.51	M-008
		b) Labour					
		Mate	day	0.18	171.00	30.78	L-12
		Mazdoor (Skilled)	day	1.50	200.00	300.00	L-15
		Mazdoor	day	*3.00	157.00	471.00	L-13
		c) Overhead charges @ 0.25 on (a+b)				1214.2	
		d) Contractor's profit @ 0.1 on (a+b+c)				607.11	
		Cost for 5.63 cum = a+b+c+d				6678.25	
		Rate per cum = (a+b+c+d)/5.63				1186.19	
					<i>say</i>	<u>1186.00</u>	
	*	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.					
		<i>Unit = cum</i>					
		<i>Taking out put = 1 cum</i>					
		Concrete Grade M15 Rate as per item No. 12.8 (A) including OH & CP	cum	1.00	3733.00	3733.00	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.				74.66	
		Rate per cum				3807.66	
					<i>say</i>	<u>3808.00</u>	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Stone weighing not less than 40kg	cum	1.00	294.26	294.26	M-003
		Stone spalls of minimum 25 mm size	cum	0.20	294.26	58.85	M-008
		b) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mason	day	0.35	213.00	74.55	L-11
		Mazdoor	day	0.75	157.00	117.75	L-13
		c) Overhead charges @ 0.25 on (a+b)				138.06	
		d) Contractor's profit @ 0.1 on (a+b+c)				69.03	
		Rate per cum = (a+b+c+d)				759.35	
						<i>say</i>	<u>759.00</u>
15.4		B Cement Concrete Blocks of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		Concrete Grade M15 Rate as per item No. 12.8 (A)	cum	1.00	3733.00	3733.00	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.				74.66	
		Rate per cum				3807.66	
						<i>say</i>	<u>3808.00</u>
15.5	2504	Providing and laying Filter material underneath pitching in slopes complete as per drawing and Technical specification					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Graded stone aggregate of required size	cum	1.20	391.93	470.32	M-012
		b) Labour					
		Mate	day	0.05	171.00	8.55	L-12
		Mazdoor (Skilled)	day	0.25	200.00	50.00	L-15
		Mazdoor *	day	1.00	157.00	157.00	L-13
		c) Overhead charges @ 0.25 on (a+b)				171.47	
		d) Contractor's profit @ 0.1 on (a+b+c)				85.73	
		Rate per cum = (a+b+c+d)				943.07	
						<i>say</i>	<u>943.00</u>
		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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm.</i>					
		a) Labour					
		Mate	day	0.02	171.00	3.42	L-12
		Mazdoor	day	0.30	157.00	47.10	L-13
		Mazdoor (Skilled)	day	0.10	200.00	20.00	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 @ 0.25 on (a+b)				#VALUE!	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		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	<u>#VALUE!</u>	
15.7	2504.4	Toe protection					
		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	Providing and laying Flooring complete as per drawing and Technical specifications laid over cement concert bedding.					
	A	Rubble stone laid in cement mortar 1:3					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Cement mortar 1:3 (Rate as in Item 12.6 sub-analysis) excluding OH & CP	cum	0.33	3074.00	1014.42	Item 12.6 (A)
		b) Add for cement concrete bedding (M15 Nominal mix) vide Item 12.8 (A) excluding OH & CP . Quantity shall be adopted as per design ( Assume Rubble stone Flooring thickness 300 mm and cement concrete bedding thickness 100 mm)	cum	0.33	2611.00	861.63	Item 12.8 (A)
		Add 1 per cent of cost to account for excavation for preparation of bed.				18.76	
		c) Material					
		Stone	cum	1.00	294.26	294.26	M-003
		Stone Spalls	cum	0.20	294.26	58.85	M-008
		d) Labour					
		Mate	day	0.08	171.00	13.68	L-12
		Mason	day	0.50	213.00	106.50	L-11
		Mazdoor (for laying stones, filling of quarry spalls)	day	1.50	157.00	235.50	L-13
		e) Overhead charges @ 0.25 on (a+c+d)				430.80	
		f) Contractor's profit @ 0.1 on (a+c+d+e)				215.40	
		Rate per cum = (a+b+c+d+e+f)				3249.81	
						say	<u>3250.00</u>
	*	Includes cement mortar for laying and filling of joints.					
15.8	B	Cement Concrete blocks Grade M15					
		Concrete Grade M15 block. (Rate as per item No. 12.8 (A) including OH & CP.	cum	1.00	3733.00	3733.00	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	3733.00	1231.89	Item 12.8 (A)
		Add 1 per cent of cost to account for excavation for preparation of bed.				49.65	
		Rate per cum				5014.54	
						say	<u>5015.00</u>
15.9	2506	Dry Rubble Flooring					
		Construction of dry rubble flooring at cross drainage works for relatively less important works.					
		<i>Unit = cum</i>					
		<i>Taking output = 1 cum</i>					
		a) Material					
		Stone	cum	1.00	294.26	294.26	M-003
		Stone Spalls	cum	0.20	294.26	58.85	M-008
		b) Labour					
		Mate	day	0.10	171.00	17.10	L-12

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mason	day	0.50	213.00	106.50	L-11
		mazdoor	day	1.50	157.00	235.50	L-13
		Add 1 per cent of (b) for trimming and preparation of base.				3.59	
		c) Overhead charges @ 0.25 on (a+b)				178.95	
		d) Contractor's profit @ 0.1 on (a+b+c)				89.48	
		Rate per cum = (a+b+c+d)				984.23	
					say	<u>984.00</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	2680.00	2680.00	Item 12.7 (A)
		Rate same as per item No. 12.7 (A) including OH & CP					
		Rate per cum			say	<u>2680.00</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	3733.00	3733.00	Item 12.8 (A)
		Rate per cum			say	<u>3733.00</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	294.26	294.26	M-003
		Stone Spalls	cum	0.20	294.26	58.85	M-008
		b) Labour					
		Mate	day	0.05	171.00	8.55	L-12
		Mason	day	0.25	213.00	53.25	L-11
		Mazdoor	day	1.00	157.00	157.00	L-13
		Add 1 per cent of cost of (a+b) for trimming and preparation of bed.				5.72	
		c) Overhead charges @ 0.25 on (a+b)				144.41	
		d) Contractor's profit @ 0.1 on (a+b+c)				72.20	
		Rate per cum = (a+b+c+d)				794.24	
					say	<u>794.00</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	171.00	47.88	L-12
		Mazdoor	day	5.00	157.00	785.00	L-13
		Mazdoor (Skilled)	day	2.00	200.00	400.00	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	93.91	5728.27	M-102



### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Stone boulders with least dimension of 200 mm	cum	12.60	294.26	3707.68	M-003
		Stone spalls of minimum size 25 mm	cum	2.52	294.26	741.54	M-008
		c) Overhead charges @ 0.25 on (a+b)				2852.59	
		d) Contractor's profit @ 0.1 on (a+b+c)				1426.29	
		Cost for 12.60 cum (a+b+c+d)				15689.24	
		Rate per cum (a+b+c+d)/12.60				1245.18	
					<i>say</i>	<u>1245.00</u>	
		<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.					
		<i>Unit = cum</i>					
		<i>Taking output = 2 x 1 x 0.3 x 10 Nos. = 6.00 cum</i>					
		a) Labour					
		Mate	day	0.14	171.00	23.94	L-12
		Mazdoor	day	2.50	157.00	392.50	L-13
		Mazdoor (Skilled)	day	1.00	200.00	200.00	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 to cover 6.00 cum.	sqm	65.00	93.91	6103.89	M-102
		Stone boulders with least dimension of 200 mm	cum	6.00	294.26	1765.56	M-003
		Stone spalls of minimum size 25 mm	cum	1.20	294.26	353.11	M-008
		c) Overhead charges @ 0.25 on (a+b)				2209.75	
		d) Contractor's profit @ 0.1 on (a+b+c)				1104.88	
		Cost for 6.00 cum (a+b+c+d)				12153.63	
		Rate per cum (a+b+c+d)/6.00				2025.60	
					<i>say</i>	<u>2026.00</u>	
		<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.					

## 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

## Summary of Rate Analysis

### CHAPTER-16 REPAIR AND REHABILITATION

Item No.	Descriptions	Unit	Rate (in Rs.)
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 1000m (Thickness 75 mm)	sqm	115.00
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	87.00
16.3	Guniting concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per Technical specification	sqm	971.00
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	102.00
B	Cement mortar (1:1) Grouting	kg	97.00
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	917.00
16.8	Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical specification	sqm	682.00
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	778.00
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	337516.00
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	324856.00
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	315059.00
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	2396.00
16.18	Replacement of damaged concrete railing.	metre	183.00
16.19	Replacement of crash barrier.	metre	300.00
16.20	Replacement of damaged mild steel railing	metre	159.00
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	190.00
16.22	Repair of RCC Railing (Carrying out repair of RCC M30 railing to bring it to the original shape.)	metre	148.00
16.23	Repair of steel Railing (Repair of steel railing to bring it to the original shape)	metre	282.00

## Analysis of Rate

### CHAPTER-16 REPAIR AND REHABILITATION

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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					
		<i>Unit = Sq m ( Thickness 75 mm)</i>					
		<i>Taking output = 10 sqm</i>					
		a) Labour					
		Mate	day	0.06	171.00	10.26	L-12
		Mazdoor	day	1.00	157.00	157.00	L-13
		b) Machinery					
		Air Compressor 250 cfm with pneumatic breaker/jack hammer along with accessories.	hour	1.00	405.00	405.00	P&M-001
		Tractor-trolley.	hour	0.50	459.00	229.50	P&M-053
		c) Overhead charges @ 0.3 on (a+b)				240.53	
		d) Contractor's profit @ 0.1 on (a+b+c)				104.23	
		Cost for 10 sqm = (a+d+c+d)				1146.52	
		Rate per sqm = (a+b+c+d)/10				114.65	
					<i>say</i>	<u>115.00</u>	
16.2	2809	Removal of existing asphaltic wearing coat comprising of 50 mm thick asphaltic concert laid over 12 mm thick mastic asphalt including disposal with all lift and lead upto 1000 m.					
		<i>Unit = Sq m</i>					
		<i>Taking output = 10 sqm</i>					
		a) Labour					
		Mate	day	0.03	171.00	5.13	L-12
		Mazdoor	day	0.75	157.00	117.75	L-13
		b) Machinery					
		Air Compressor 250 cfm with pneumatic breaker.	hour	0.75	405.00	303.75	P&M-001
		Tractor-trolley.	hour	0.40	459.00	183.60	P&M-053
		c) Overhead charges @ 0.3 on (a+b)				183.07	
		d) Contractor's profit @ 0.1 on (a+b+c)				79.33	
		Cost for 10 sqm = (a+d+c+d)				872.63	
		Rate per sqm = (a+b+c+d)/10				87.26	
					<i>say</i>	<u>87.00</u>	
16.3	2807	Guniting concrete surface with cement mortar applied with compressor after cleaning surface and spraying with epoxy complete as per Technical Specification					
		<i>Unit = Sq m</i>					
		<i>Taking output = 1 sqm</i>					
		Assuming thickness 25 mm					
		a) Material					
		Cement	kg	16.00	5.462	87.39	M-081/1000
		Graded sand	cum	0.04	133.28	5.33	M-005
		Wire mesh 50mm x 50mm size of 3mm wire	kg	2.00	37.07	74.14	M-192
		Epoxy	kg	0.67	525.00	351.75	M-095
		Accelerator compound for guniting @ 4 per cent of weight of cement	kg	0.64	150.00	96.00	M-180
		Add 2 per cent of cost of material for miscellaneous consumables like nozzles, wire brush, cotton waste				12.29	
		b) Labour					
		Mate	day	0.01	171.00	1.71	L-12
		Mason	day	0.04	213.00	8.52	L-11
		Mazdoor	day	0.14	157.00	21.98	L-13
		c) Machinery					
		Compressor with guniting equipment along with accessories	hour	0.10	196.00	19.60	P&M-076
		d) Overhead charges @ 0.3 on (a+b+c)				203.61	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				88.23	
		Rate per sqm = (a+b+c+d+e)				970.56	
					<i>say</i>	<u>971.00</u>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	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					
		<i>Unit = Number</i>					
		<i>Taking output = 1 No.</i>					
		a) Material					
		Nipples	each	1.00	input	#VALUE!	M-129
		Cement, fixing compound and consumables @ 15 per cent of cost of nipple				#VALUE!	
		b) Labour					
		Mate	day	0.01	171.00	1.71	L-12
		Mazdoor (Skilled) labour for drilling	day	0.08	200.00	16.00	L-15
		Mazdoor (Skilled) labour for fixing nipple and sealing inlets	day	0.08	200.00	16.00	L-15
		Mazdoor for cutting and removing of nipples	day	0.04	157.00	6.28	L-13
		Add 10 per cent of labour cost for drilling holes etc				4.00	
		c) Overhead charges @ 0.3 on (a+b)				#VALUE!	
		d) Contractor's profit @ 0.1 on (a+b+c)				#VALUE!	
		Rate per No. = (a+b+c+d)				#VALUE!	
					say	#VALUE!	
16.5	2806	Sealing of cracks/porous concrete by injection process through nipples/Grouting complete as per Technical Specification.					
	A	Cement Grout					
		<i>Unit = kg</i>					
		<i>Taking output = 1 kg</i>					
		a) Material					
		Cement including 10 per cent wastage	kg	1.10	5.46	6.01	M-081/1000
		Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement				1.20	
		b) Labour					
		Mate	day	0.08	171.00	13.68	L-12
		Mazdoor (Skilled)	day	0.10	200.00	20.00	L-15
		Mazdoor	day	0.10	157.00	15.70	L-13
		c) Machinery					
		Grout pump with agitator and accessories	hour	0.10	150.00	15.00	M-111
		d) Overhead charges @ 0.3 on (a+b+c)				21.48	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				9.31	
		Rate per kg = (a+b+c+d+e)				102.37	
					say	<u>102.00</u>	
	B	Cement Mortar (1:1) Grouting					
		<i>Unit = kg</i>					
		<i>Taking output = 1 kg</i>					
		a) Material					
		Cement including 10 per cent wastage	kg	0.55	5.46	3.00	M-081/1000
		Sand including 10 per cent wastage	kg	0.55	0.09	0.05	M-005/1500
		Admixtures (anti shrinkage compound) @ 20 per cent of cost of cement				0.60	
		b) Labour					
		Mate	day	0.08	171.00	13.68	L-12
		Mazdoor (Skilled)	day	0.10	200.00	20.00	L-15
		Mazdoor	day	0.10	157.00	15.70	L-13
		c) Machinery					
		Grout pump with agitator and accessories	hour	0.10	150.00	15.00	M-111
		d) Overhead charges @ 0.3 on (a+b+c)				20.41	

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		e) Contractor's profit @ 0.1 on (a+b+c+d)				8.84	
		Rate per kg = (a+b+c+d+e)				97.29	
					<i>say</i>	<u>97.00</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.					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm for an average thickness of 25mm.</i>					
		a) Labour					
		Male	day	0.06	171.00	10.26	L-12
		Mazdoor (Skilled)	day	0.75	200.00	150.00	L-15
		Mazdoor	day	0.75	157.00	117.75	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	150.00	300.00	M-111
		d) Overhead charges @ 0.3 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!	
					<i>say</i>	<u>#VALUE!</u>	
		<b>Note</b>					
		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.					
		<i>Unit = kg</i>					
		<i>Taking output = 1 kg</i>					
		a) Material					
		Epoxy including 10 per cent wastage	kg	1.10	525.00	577.50	M-095
		b) Labour					
		Male	day	0.08	171.00	13.68	L-12
		Mazdoor (Skilled)	day	0.10	200.00	20.00	L-15
		Mazdoor	day	0.10	157.00	15.70	L-13
		c) Machinery					
		Epoxy Injection gun	hour	0.10	147.00	14.70	P&M-078
		d) Overhead charges @ 0.3 on (a+b+c)				192.47	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				83.41	
		Rate per kg = (a+b+c+d+e)				917.46	
					<i>say</i>	<u>917.00</u>	
16.8	2804	Applying epoxy mortar over leached, honey combed and spalled concrete surface and exposed steel reinforcement complete as per Technical Specification					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		Assume average 10mm thickness of epoxy mortar					
		a) Material					
		Epoxy resin-hardener mix for prime coat	kg	2.50	637.50	1593.75	M-098
		Epoxy mortar	kg	2.20	720.00	1584.00	M-096
		Epoxy resin -hardener mix for seal coat.	kg	2.00	637.50	1275.00	M-098

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Add 3 per cent cost of material for other consumables like acetone etc and to cover wastage.				133.58	
		b) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mazdoor (Skilled)	day	0.50	200.00	100.00	L-15
		Mazdoor	day	0.50	157.00	78.50	L-13
		c) Overhead charges @ 0.3 on (a+b)				1431.50	
		d) Contractor's profit @ 0.1 on (a+b+c)				620.32	
		Cost for 10 sqm = a+b+c+d				6823.49	
		Rate per sqm = (a+b+c+d)/10				682.35	
					<i>say</i>	<u>682.00</u>	
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>					
		a) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mazdoor	day	0.50	157.00	78.50	L-13
		Mazdoor (Skilled)	day	0.50	200.00	100.00	L-15
		b) Machinery					
		Air compressor 250 cfm	hour	1.00	405.00	405.00	P&M-001
		Shotcreteing equipment	hour	1.00	196.00	196.00	P&M-076
		water tanker 6 KL capacity	hour	0.02	154.00	3.08	P&M-060
		c) Material					
		Cement	kg	120.00	5.462	655.44	M-081/1000
		Sand	cum	0.15	133.28	19.99	M-005
		Coarse aggregate of size 4.75mm	cum	0.15	195.72	29.36	M-024
		Quick setting compound	kg	2.50	input	#VALUE!	M-147
		Water	KL	0.10	225.00	22.50	M-189
		d) Overhead charges @ 0.3 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!	
					<i>say</i>	<u>#VALUE!</u>	
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					
		a) Material					
		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) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mazdoor (Skilled)	day	0.50	200.00	100.00	L-15

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mazdoor	day	0.50	157.00	78.50	L-13
		c) Overhead charges @ 0.3 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	<u>#VALUE!</u>	
16.11	2805	Epoxy bonding of new concrete to old concrete					
		<i>Unit = sqm</i>					
		<i>Taking output = 10 sqm</i>					
		a) Material					
		Epoxy resin with pot life not less than 60-90 minutes and satisfying testing as per clause 2803.9	kg	8.00	637.50	5100.00	M-098
		Add 3 per cent of (a ) above for wastage.				153.00	
		b) Labour					
		Mate	day	0.04	171.00	6.84	L-12
		Mazdoor (Skilled)	day	0.50	200.00	100.00	L-15
		Mazdoor	day	0.50	157.00	78.50	L-13
		c) Overhead charges @ 0.3 on (a+b)				1631.50	
		d) Contractor's profit @ 0.1 on (a+b+c)				706.98	
		Cost for 10 sqm = a+b+c+d				7776.83	
		Rate per sqm = (a+b+c+d)/10				777.68	
						say	<u>778.00</u>
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.					
		<i>Unit = MT</i>					
		<i>Taking output = 1 MT</i>					
		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	66566.75	69895.09	M-119
		HDPE pipes 75mm dia including 5 per cent wastage	metre	112.00	202.50	22680.00	M-114
		Cement for grouting	kg	400.00	5.462	2184.80	M-081/1000
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	8.00	45.00	360.00	M-187
		Epoxy	kg	6.00	525.00	3150.00	M-095
		MS plates for deviator (where deviator blocks are not provided)	tonne	2.10	44879.36	94246.66	M-179
		Add 20 per cent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				38503.31	
		b) Labour					
		i) For making holes in the structure .					
		Mate	day	0.24	171.00	41.04	L-12
		Mazdoor (Semi-skilled)	day	3.00	164.00	492.00	L-14
		Mazdoor	day	3.00	157.00	471.00	L-13
		ii) For making and fixing anchorages for cables and placement of cables .					
		Mate	day	0.44	171.00	75.24	L-12
		Blacksmith	day	3.00	213.00	639.00	L-02a
		Mazdoor	day	8.00	157.00	1256.00	L-13
		iii) For prestressing					



## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mate/Supervisor	day	0.13	171.00	22.23	L-12
		Fitter	day	0.70	216.00	151.20	L-08
		Mazdoor	day	2.65	157.00	416.05	L-13
		<b>iv) For grouting</b>					
		Mate/Supervisor	day	0.13	171.00	22.23	L-12
		Mason	day	0.70	213.00	149.10	L-11
		Mazdoor	day	2.65	157.00	416.05	L-13
		<b>c) Machinery</b>					
		Stressing jack with pump	hour	4.00	163.00	652.00	P&M-040
		Grouting pump with agitator	hour	1.35	150.00	202.50	M-111
		<b>d) Overhead charges @ 0.3 on (a+b+c)</b>				70807.65	
		<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				30683.31	
		<b>Rate per MT = (a+b+c+d+e)</b>				337516.45	
					<b>say</b>	<b><u>337516.00</u></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. <b>Unit = MT</b> <b>Taking output = 3.10 MT</b> 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	66566.75	206356.93	M-119
		HDPE pipes 90mm dia including 5 per cent wastage	metre	224.00	202.50	45360.00	M-115
		Cement for grouting	tonne	1.01	5462.00	5516.62	M-081
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	8.00	45.00	360.00	M-187
		Epoxy	kg	10.00	525.00	5250.00	M-095
		MS plates for deviator (where deviator blocks are not provided)	tonne	7.00	44879.36	314155.52	M-179
		Add 20 per cent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				115399.81	
		<b>b) Labour</b>					
		<b>i) For making holes in the structure .</b>					
		Mate	day	0.08	171.00	13.68	L-12
		Mazdoor (Semi-skilled)	day	8.00	164.00	1312.00	L-14
		Mazdoor	day	8.00	157.00	1256.00	L-13
		<b>ii) For making and fixing anchorages for cables and placement of cables .</b>					
		Mate	day	1.28	171.00	218.88	L-12
		Blacksmith	day	7.00	213.00	1491.00	L-02a
		Mazdoor	day	25.00	157.00	3925.00	L-13
		<b>iii) For prestressing</b>					
		Mate/Supervisor	day	0.20	171.00	34.20	L-12
		Fitter	day	1.00	216.00	216.00	L-08
		Mazdoor	day	4.00	157.00	628.00	L-13
		<b>iv) For grouting</b>					
		Mate/Supervisor	day	0.26	171.00	44.46	L-12
		Mason	day	1.50	213.00	319.50	L-11
		Mazdoor	day	5.00	157.00	785.00	L-13
		<b>c) Machinery</b>					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Stressing jack with pump	hour	7.00	163.00	1141.00	P&M-040
		Grouting pump with agitator	hour	3.00	150.00	450.00	M-111
		d) Overhead charges @ 0.3 on (a+b+c)				211270.08	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				91550.37	
		Cost for 3.10 MT = a+b+c+d+e				1007054.05	
		Rate per MT = (a+b+c+d+e)/3.10				324856.14	
					say	<u>324856.00</u>	
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.					
		<i>Unit = MT</i>					
		<i>Taking output = 9.28 MT</i>					
		Assume 12.7mm dia. Strand in 19T13 system. Weight-14.73 kg/m of cable.					
		a) Material					
		HTS strand including 5 per cent wastage and extra length for jacking	tonne	9.28	66566.75	617739.44	M-119
		HDPE pipes 90 mm dia including 5 per cent wastage	metre	672.00	202.50	136080.00	M-115
		Cement for grouting	tonne	3.04	5462.00	16604.48	M-081
		Tube anchorage set complete with bearing plate, permanent wedges etc	each	12.00	45.00	540.00	M-187
		Epoxy	kg	14.00	525.00	7350.00	M-095
		MS plates for deviator (where deviator blocks are not provided)	tonne	20.00	44879.36	897587.20	M-179
		Add 20 per cent cost of material for other materials like lead sheet, sleeves, deviator fixtures etc.				335180.22	
		b) Labour					
		i) For making holes in the structure .					
		Mate	day	1.72	171.00	294.12	L-12
		Mazdoor Semi-skilled)	day	18.00	164.00	2952.00	L-14
		Mazdoor	day	25.00	157.00	3925.00	L-13
		ii) For making and fixing anchorages for cables and placement of cables .					
		Mate	day	4.00	171.00	684.00	L-12
		Blacksmith	day	20.00	213.00	4260.00	L-02a
		Mazdoor	day	80.00	157.00	12560.00	L-13
		iii) For prestressing					
		Mate/Supervisor	day	0.30	171.00	51.30	L-12
		Fitter	day	1.50	216.00	324.00	L-08
		Mazdoor	day	6.00	157.00	942.00	L-13
		iv) For grouting					
		Mate/Supervisor	day	1.00	171.00	171.00	L-12
		Mason	day	5.00	213.00	1065.00	L-11
		Mazdoor	day	20.00	157.00	3140.00	L-13
		c) Machinery					
		Stressing jack with pump	hour	10.00	163.00	1630.00	P&M-040
		Grouting pump with agitator	hour	10.00	150.00	1500.00	M-111
		d) Overhead charges @ 0.3 on (a+b+c)				613373.93	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				265795.37	
		Cost for 9.28 MT = a+b+c+d+e				2923749.06	
		Rate per MT = (a+b+c+d+e)/9.28				315059.17	
					say	<u>315059.00</u>	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
16.15	2808	Replacement of Bearings complete as per Technical Specification					
		<i>Unit = No</i>					
		<i>Taking output = 3 No.</i>					
		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	1079.00	3237.00	P&M-084
		Mate	day	0.64	171.00	109.44	L-12
		Mazdoor (Skilled)	day	4.00	200.00	800.00	L-15
		Mazdoor	day	12.00	157.00	1884.00	L-13
		v) Wooden packing	cum	0.15	input	#VALUE!	M-195
		b) Replacement of bearing					
		Cost of bearing.	each	3.00	74250.00	222750.00	M-065
		c) Overhead charges @ 0.3 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	#VALUE!	
	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					
		<i>Unit = 1 No</i>					
		<i>Taking output = 3 No.</i>					
		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	1079.00	3237.00	P&M-084
		ii) Mate	day	0.64	171.00	109.44	L-12
		iii) Mazdoor (Skilled)	day	4.00	200.00	800.00	L-15
		iv) Mazdoor	day	12.00	157.00	1884.00	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 @ 0.3 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	#VALUE!	
	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					
		<i>Unit - 1 RM</i>					
		<i>Taking output = 12 RM</i>					
		a) Material					
		Epoxy for bonding new concrete to old concrete @ 0.8 kg/sqm	kg	9.60	525.00	5040.00	M-095
		M-30 grade cement concrete excluding OH & CP (Rate as per items 14.1 C (i))	cum	3.60	3883.00	13978.80	Item 14.1(C) case II
		b) Labour					
		Removal of old expansion joint including breaking of concrete, cutting of lugs and shifting of broken material etc.					
		Mate	day	0.26	171.00	44.46	L-12
		Mazdoor	day	6.00	157.00	942.00	L-13
		Mazdoor (Skilled)	day	0.50	200.00	100.00	L-15

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		c) Overhead charges @ 0.3 on (a+b)				6031.58	
		d) Contractor's profit @ 0.1 on (a+b+c)				2613.68	
		Cost for replacement of 12 RM = a+b+c+d				28750.52	
		Rate per RM = (a+b+c+d)/12				2395.88	
					<i>say</i>	<u>2396.00</u>	
		<b>Note</b> 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		<b>Replacement of Damaged Concrete Railing.</b>					
		<i>Unit = RM</i>					
		<i>Taking output = 10 RM</i>					
		<b>a) Labour</b>					
		Labour for dismantling old railing and disposal of dismantled material.					
		Mate	day	0.20	171.00	34.20	L-12
		Mazdoor	day	5.00	157.00	785.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley for disposal of dismantled material	hour	1.00	459.00	459.00	P&M-053
		c) Overhead charges @ 0.3 on (a+b)				383.46	
		d) Contractor's profit @ 0.1 on (a+b+c)				166.17	
		Cost for 10 m = a+b+c+d				1827.83	
		Rate per metre = (a+b+c+d)/10				182.78	
					<i>say</i>	<u>183.00</u>	
		<b>Note</b> The rate for the provision of new railing may be adopted from the chapter on superstructure.					
16.19		<b>Replacement of Crash Barrier.</b>					
		<i>Unit = RM</i>					
		<i>Taking output = 10 M</i>					
		<b>a) Labour</b>					
		Labour for dismantling old railing and disposal of dismantled material.					
		Mate	day	0.40	171.00	68.40	L-12
		Mazdoor	day	10.00	157.00	1570.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley for disposal of dismantled material	hour	1.00	459.00	459.00	P&M-053
		c) Overhead charges @ 0.3 on (a+b)				629.22	
		d) Contractor's profit @ 0.1 on (a+b+c)				272.66	
		Cost for 10 m = a+b+c+d				2999.28	
		Rate per metre = (a+b+c+d)/10				299.93	
					<i>say</i>	<u>300.00</u>	
		<b>Note</b> The rate for the construction of new crash barrier may be adopted from chapter 8 on Traffic and Transportation.					
16.20		<b>Replacement of Damaged Mild Steel Railing</b>					
		<i>Unit = RM</i>					
		<i>Taking output = 10 M</i>					
		<b>a) Labour</b>					
		Labour for dismantling old railing and disposal of dismantled material.					
		Mate	day	0.16	171.00	27.36	L-12
		Mazdoor	day	4.00	157.00	628.00	L-13
		<b>b) Machinery</b>					
		Tractor-trolley for disposal of dismantled material	hour	1.00	459.00	459.00	P&M-053
		c) Overhead charges @ 0.3 on (a+b)				334.31	
		d) Contractor's profit @ 0.1 on (a+b+c)				144.87	
		Cost for 10 m = a+b+c+d				1593.53	

## Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Rate per metre = (a+b+c+d)/10				159.35	
					<i>say</i>	<u>159.00</u>	
16.21		Repair of Crash Barrier					
		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.					
		<i>Unit = Running meter.</i>					
		<i>Taking output = 10 M.</i>					
		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	171.00	6.84	L-12
		Mazdoor	day	1.00	157.00	157.00	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	3883.00	1164.90	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 @ 0.3 on (a)				398.62	
		d) Contractor's profit @ 0.1 on (a+c)				172.74	
		Cost for 10 m = a+b+c+d				1900.10	
		Rate per m = (a+b+c+d)/10				190.01	
					<i>say</i>	<u>190.00</u>	
16.22		Repair of RCC Railing					
		Carrying out repair of RCC M30 railing to bring it to the original shape.					
		<i>Unit = Running meter.</i>					
		<i>Taking output = 10 M.</i>					
		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	3883.00	388.30	Item 14.1(C) case II
		HYSD bar reinforcement Rate as per item No 14.2(Excluding OH & CP)	tonne	0.013	47355.00	615.62	Item 14.2 A
		b) Labour*					DIR used item
		Mate	day	0.016	171.00	2.74	L-12
		mazdoor	day	0.20	157.00	31.40	L-13
		* For dismantling and trimming the surface to a regular shape and removal of damaged material.					
		c) Overhead charges @ 0.3 on (b)				311.42	
		d) Contractor's profit @ 0.1 on (b+c)				134.95	
		Cost for 10 m = a+b+c+d				1484.41	
		Rate per m = (a+b+c+d)/10				148.44	
					<i>say</i>	<u>148.00</u>	
16.23		Repair of Steel Railing					
		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 .					
		<i>Unit = Running meter.</i>					
		<i>Taking output = 10 M.</i>					
		a) Material					

### Analysis of Rate

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
		Mild steel ISMC series	kg	29.00	44.879	1301.50	M-179/1000
		Flat iron	kg	10.00	44.879	448.79	M-179/1000
		MS Bolt and nuts	kg	1.00	58.03	58.03	M-130
		Add 5 per cent of cost of material for painting.				90.42	
		<b>b) Labour</b>					
		Mate	day	0.016	171.00	2.74	L-12
		Mazdoor (Skilled)	day	0.20	200.00	40.00	L-15
		Mazdoor	day	0.20	157.00	31.40	L-13
		<b>c) Overhead charges @ 0.3 on (a+b)</b>				591.86	
		<b>d) Contractor's profit @ 0.1 on (a+b+c)</b>				256.47	
		Cost of repair for 10m = a+b+c+d				2821.21	
		Cost of meter = (a+b+c+d)/10				282.12	
					<i>say</i>	<u>282.00</u>	

**Sub - Analysis\_B**

Sr No	Ref. to MoRTH Spec.	Description	Unit	Quantity	Rate Rs	Cost Rs	Remarks/ Input ref.
3.1	301	Excavation in Soil by Manual Means .					
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 upto1000 metres. <i>Including royalty @ Rs. 22.00 per cum but excluding the cost of watering , rolling &amp; compaction</i>					
	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.					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
	a)	Labour					
		Mate	day	1.800	171.00	307.80	L-12
		Mazdoor	day	45.000	157.00	7065.00	L-13
	b)	Machinery					
		Truck 5.5 cum capacity	hour	10.000	0.00	0.00	P&M-057
	c)	Overhead charges @ 0.1 on (a+b)				737.28	
	d)	Contractor's profit @ 0.1 on (a+b+c)				811.01	
		Cost of 120 cum = a+b+c+d				8921.09	
		Rate per cum = (a+b+c+d)/120				74.34	
		Royalty @ Rs. 22.00 per Cum				22.00	
		Rate per cum			<i>say</i>	<b>96.00</b>	
3.1	301	Excavation in Soil by Manual Means .					
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 upto1000 metres.(inclusive of royalty@Rs.22.0/cum,watering,rolling,andcompaction					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
	a)	Labour					
		Mate	day	1.800	171.00	307.80	L-12
		Mazdoor	day	45.000	157.00	7065.00	L-13
	b)	Machinery					
		Truck 5.5 cum capacity	hour	10.000	782.00	7820.00	P&M-057
		Smooth wheel roller @ 70 cum per hour	hour	1.500	604.00	906.00	P&M-044
		Water Tanker @ 6.0 KL capacity	hour	0.800	154.00	123.20	P&M-060
	c)	Materials					
		Cost of water	KL	4.800	225.00	1080.00	M-189
	d)	Overhead charges @ 0.1 on (a+b+c)				1730.20	
	e)	Contractor's profit @ 0.1 on (a+b+c+d)				1903.22	
		Cost of 120 cum = a+b+c+d+e				20935.42	
		Rate per cum = (a+b+c+d+e)/120				174.46	
		Royalty @ Rs. 22.00 per Cum				22.00	
		Rate per cum			<i>say</i>	<b>196.00</b>	
3.2	301	Excavation in Ordinary Rock by Manual Means					
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 ( <i>including royalty @ Rs. 22.00 per cum but excluding watering, rolling &amp; compaction</i> )					
		<i>Unit = cum</i>					
		<i>Taking output = 120 cum</i>					
	a)	Labour					
		Mate	day	2.800	171.00	478.80	L-12

**Sub - Analysis\_B**

			Mazdoor	day	70.000	157.00	10990.00	L-13
			b) Machinery					
			c) Overhead charges @ 0.1 on (a+b)				1146.88	
			d) Contractor's profit @ 0.1 on (a+b+c)				1261.57	
			Cost for 120 cum = a+b+c+d				13877.25	
			Rate per cum = (a+b+c+d)/120				115.64	
			Royalty @ Rs. 22.00 per Cum				22.00	
			Rate per cum				137.64	
						say	<b>138.00</b>	
		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.					
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 (including royalty @ Rs. 22.00 per cum, watering, rolling & compaction - from immediate vicinity)					
			<i>Unit = cum</i>					
			<i>Taking output = 120 cum</i>					
			a) Labour					
			Mate	day	2.800	171.00	478.80	L-12
			Mazdoor	day	70.000	157.00	10990.00	L-13
			b) Machinery					
			Truck 5.5 cum capacity	hour	10.000	782.00	7820.00	P&M-057
			Smooth wheel roller @ 70 cum per hour	hour	1.500	604.00	906.00	P&M-044
			Water Tanker @ 6.0 KL capacity	hour	0.800	154.00	123.20	P&M-060
			c) Materials					
			Cost of water	KL	4.800	225.00	1080.00	M-189
			d) Overhead charges @ 0.1 on (a+b+c)				2139.80	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				2353.78	
			Cost for 120 cum = a+b+c+d				25891.58	
			Rate per cum = (a+b+c+d)/120				215.76	
							22.00	
			Rate per cum				237.76	
						say	<b>238.00</b>	
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 @ Rs. 22.00 per cum, watering, rolling & compaction)					
			<i>Unit = cum</i>					
			<i>Taking output = 360 cum</i>					
			a) Labour					
			Mate	day	0.080	171.00	13.68	L-12
			Mazdoor	day	2.000	157.00	314.00	L-13
			b) Machinery					
			Hydraulic excavator 0.9 cum bucket capacity @ 60 cum per hour	hour	6.000	1646.00	9876.00	P&M-026
			Tipper 5.5 cum capacity, 4 trips per hour.	hour	16.000	787.00	12592.00	P&M-048
			Smooth wheel roller @ 70 cum per hour	hour	4.500	604.00	2718.00	P&M-044
			Water Tanker @ 6.0 KL capacity	hour	2.400	154.00	369.60	P&M-060
			c) Materials					
			Cost of water	KL	14.400	225.00	3240.00	M-189
			d) Overhead charges @ 0.1 on (a+b+c)				2912.33	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				3203.56	
			Cost for 360 cum = a+b+c+d				35239.17	
			Rate per cum = (a+b+c+d)/360				97.89	
			Royalty @ Rs. 22.00 per Cum				22.00	
			Rate per cum				119.89	
						say	<b>120.00</b>	



**Sub - Analysis\_B**

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 (including royalty @ Rs. 22.00 per cum , watering, rolling & compaction)					
			<i>Unit = cum</i>					
			<i>Taking output = 240 cum</i>					
			a) Labour					
			Mate	day	0.080	171.00	13.68	L-12
			Mazdoor	day	2.000	157.00	314.00	L-13
			b) Machinery					
			Hydraulic Excavator 0.90 cum bucket capacity @ 36 cum per hour	hour	6.000	1646.00	9876.00	P&M-026
			Tipper 5.5 cum capacity, 4 trips per hour.	hour	11.000	787.00	8657.00	P&M-048
			Smooth wheel roller @ 70 cum per hour	hour	3.000	604.00	1812.00	P&M-044
			Water Tanker @ 6.0 KL capacity	hour	1.600	154.00	246.40	P&M-060
			c) Materials					
			Cost of water	KL	9.600	225.00	2160.00	M-189
			d) Overhead charges @ 0.1 on (a+b+c)				2307.91	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				2538.70	
			Cost for 240 cum = a+b+c+d+e				27925.69	
			Rate per cum = (a+b+c+d+e)/240				116.36	
			Royalty @ Rs. 22.00 per Cum				22.00	
			Rate per cum				138.36	
						say	<b>138.00</b>	
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 (including royalty @ Rs. 22.00 per cum watering, rolling & compaction)					
			<i>Unit = cum</i>					
			<i>Taking output = 300 cum</i>					
			a) Labour					
			Mate	day	0.080	171.00	13.68	L-12
			Mazdoor	day	2.000	157.00	314.00	L-13
			b) Machinery					
			Hydraulic excavator 0.90 cum bucket capacity @ 50 cum per hour	hour	6.000	1646.00	9876.00	P&M-026
			Tipper 5.5 cum capacity, 4 trips per hour.	hour	13.640	787.00	10734.68	P&M-048
			Smooth wheel roller @ 70 cum per hour	hour	3.750	604.00	2265.00	P&M-044
			Water Tanker @ 6.0 KL capacity	hour	2.000	154.00	308.00	P&M-060
			c) Materials					
			Cost of water	KL	12.000	225.00	2700.00	M-189
			d) Overhead charges @ 0.1 on (a+b+c)				2621.14	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				2883.25	
			Cost for 300 cum = a+b+c+d+e				31715.75	
			Rate per cum = (a+b+c+d+e)/300				105.72	
			Royalty @ Rs. 22.00 per Cum				22.00	
			Rate per cum				127.72	
						say	<b>128.00</b>	
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.					
			<i>Unit = cum</i>					
			<i>Taking output = 100 cum</i>					

**Sub - Analysis\_B**

		a) Labour						
		Mate	day	0.040	171.00	6.84	L-12	
		Mazdoor	day	1.000	157.00	157.00	L-13	
		b) Machinery						
		Hydraulic Excavator1 cum bucket capacity @ 60 cum per hour	hour	1.670	1646.00	2748.82	P&M-026	
		Tipper 10 tonne capacity	tonne.km	160 x L	6.85	1096.00	P&M-047	
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				109.60		
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	4704.00	2352.00	P&M-014	
		Motor grader for grading @ 100 cum per hour	hour	1.000	2435.00	2435.00	P&M-032	
		Water tanker6 KL capacity	hour	4.000	154.00	616.00	P&M-060	
		Smooth wheel roller 8-10 tonnes @ 70 cum per hour	hour	1.430	604.00	863.72	P&M-044	
		c) Material						
		Cost of water	KL	24.000	225.00	5400.00	M-189	
		Compensation & Royalty for earth taken from private land	cum	100.000	23.65	2365.00	M-092	
		d) Overhead charges @ 0.1 on (a+b+c)				1815.00		
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1996.50		
		Cost for 100 cum = a+b+c+d+e				21961.48		
		Rate per cum = (a+b+c+d+e)/100				219.61		
						say	220.00	
		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	Construction of Embankment with Material Deposited from Roadway Cutting						
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.						
		<i>Unit = cum</i>						
		<i>Taking output = 100 cum</i>						
		a) Labour						
		Mate	day	0.020	171.00	3.42	L-12	
		Mazdoor	day	0.500	157.00	78.50	L-13	
		b) Machinery						
		Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	4704.00	2352.00	P&M-014	
		Motor grader for grading @ 100 cum per hour	hour	1.000	2435.00	2435.00	P&M-032	
		Water tanker6 KL capacity	hour	4.000	154.00	616.00	P&M-060	
		Smooth wheel roller 8-10 tonnes @ 56 cum per hour	hour	1.430	604.00	863.72	P&M-044	
		c) Material						
		Cost of water	KL	24.000	225.00	5400.00	M-189	
		d) Overhead charges @ 0.1 on (a+b+c)				1174.86		
		e) Contractor's profit @ 0.1 on (a+b+c+d)				1292.35	M-189	
		Rate for 100 cum = a+b+c+d+e				14215.85	M-092	
		Rate per cum = (a+b+c+d+e)/100				142.16		
		Royalty @ Rs. 22.00 per Cum				22.00		
						say	164.00	
		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.						

**Sub - Analysis\_B**

3.18	305		Construction of Subgrade and Earthen Shoulders						
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						
			<i>Unit = cum</i>						
			<i>Taking output = 100 cum</i>						
			a) Labour						
			Mate	day	0.040	171.00	6.84		L-12
			Mazdoor	day	1.000	157.00	157.00		L-13
			b) Machinery						
			Hydraulic excavator 1 cum bucket capacity @ 60 cum per hour	hour	1.670	1646.00	2748.82		P&M-026
			Tipper 10 tonne capacity	tonne.km	175xL	6.85	1198.75		P&M-047
			Add 10 per cent of cost of carriage to cover cost of loading and unloading				119.88		
			Dozer 80 HP for spreading @ 200 cum per hour	hour	0.500	4704.00	2352.00		P&M-014
			Motor grader for grading @ 50 cum per hour	hour	2.000	2435.00	4870.00		P&M-032
			Water tanker with 6 km lead	hour	4.000	154.00	616.00		P&M-060
			Smooth wheel roller 8-10 tonnes @ 56 cum per hour	hour	1.790	604.00	1081.16		P&M-044
			c) Material						
			Cost of water	KL	24.000	225.00	5400.00		M-189
			Compensation & Royalty for earth taken from private land	cum	100.000	23.65	2365.00		M-092
			d) Overhead charges @ 0.1 on (a+b+c)				2091.54		
			e) Contractor's profit @ 0.1 on (a+b+c+d)				2300.70		
			Cost for 100 cum = a+b+c+d+e				25307.69		
			Rate per cum = (a+b+c+d+e)/100				253.08		
							<i>say</i>	<u>253.00</u>	
3.19	305.3.4		Compacting Original Ground						
			Compacting original ground supporting sub-grade						
SUB ANA -B		Case-I	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.						
			<i>Unit = cum</i>						
			<i>Taking output = 600 cum</i>						
			a) Labour						
			Mate	day	0.120	171.00	20.52		L-12
			Mazdoor	day	3.000	157.00	471.00		L-13
			b) Machinery						
			Tractor with ripper attachment	hour	9.000	494.00	4446.00		P&M-055
			Motor grader for grading	hour	6.000	2435.00	14610.00		P&M-032
			Water tanker 6 KL capacity	hour	4.000	154.00	616.00		P&M-060
			Smooth wheel roller 8-10 tonnes @ 56 cum per hour	hour	10.710	604.00	6468.84		P&M-044
			c) Material						
			Cost of water	KL	24.000	225.00	5400.00		M-189
			d) Overhead charges @ 0.1 on (a+b+c)				3203.24		
			e) Contractor's profit @ 0.1 on (a+b+c+d)				3523.56		
			Cost for 600 cum = a+b+c+d+e				38759.16		
			Rate per cum = (a+b+c+d+e)/600				64.60		
							<i>say</i>	<u>65.00</u>	
3.19			Compacting original ground supporting embankment						
SUB ANA -B		Case-II	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.						
			<i>Unit = cum</i>						
			<i>Taking output = 600 cum</i>						
			a) Labour						

**Sub - Analysis\_B**

			Mate	day	0.080	171.00	13.68	L-12
			Mazdoor	day	2.000	157.00	314.00	L-13
			<b>b) Machinery</b>					
			Tractor with ripper attachment	hour	6.000	494.00	2964.00	P&M-055
			Smooth wheel roller 8-10 tonnes @ 56 cum per hour	hour	10.710	604.00	6468.84	P&M-044
			Water tanker 6 KL capacity	hour	4.000	154.00	616.00	P&M-060
			<b>c) Material</b>					
			Cost of water	KL	24.000	225.00	5400.00	M-189
			<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				1577.65	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				1735.42	
			Cost for 600 cum = (a+b+c+d+e)				19089.59	
			Rate per sqm = (a+b+c+d+e)/600				31.82	
						say	<u>32.00</u>	
5.11	512		Close Graded Premix Surfacing/Mixed Seal Surfacing					
			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.					
			<i>Unit = sqm</i>					
			<i>Taking output = 10250 sqm (205 cum)</i>					
			<b>a) Labour</b>					
			Mate	day	0.840	171.00	143.64	L-12
			Mazdoor working with HMP, road sweeper, paver and roller	day	16.000	157.00	2512.00	L-13
			Skilled mazdoor for checking line & levels	day	5.000	200.00	1000.00	L-15
			<b>b) Machinery</b>					
			i) HMP of appropriate capacity - 75 t per hour	hour	6.000	29942.00	179652.00	P&M-022
			ii) Electric Generator Set 250 KVA	hour	6.000	2896.00	17376.00	P&M-081
			iii) Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
			iv) Tipper 10 tonne capacity	tonne.km	450 x L	6.85	3082.50	Lead =1 km & P&M-047
			Add 10 per cent of cost of carriage to cover cost of loading and unloading				308.25	
			v) Paver finisher hydrostatic with sensor attachment	hour	6.000	2889.00	17334.00	P&M-034
			iv) Smooth wheeled 8-10 tonnes weight	hour	6.000	604.00	3624.00	P&M-044
			<b>c) Material</b>					
			<b>Type - B</b>					
			Bitumen @ 19 kg per 10 sqm	tonne	19.480	48460.30	944006.64	M-074
			Stone crushed aggregates 13.2 mm to 0.09 mm @ 0.27 cum per 10 sqm	cum	276.750	452.61	125259.82	M-042
			<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				130072.49	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				143079.73	
			Cost for 10250 sqm = a+b+c+d+e				1573877.07	
			Rate per sqm = (a+b+c+d+e)/10250				153.55	
			For Type 'B'			say	<u>154.00</u>	
			<b>With Smooth wheel Roller</b>					

**Sub - Analysis\_B**

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	<i>Unit = cum</i>					
			<i>Taking output = 360 cum</i>					
			a) <b>Labour</b>					
			Mate	day	10.080	171.00	1723.68	L-12
			Mazdoor skilled	day	2.000	200.00	400.00	L-15
			Mazdoor	day	250.000	157.00	39250.00	L-13
			b) <b>Machinery</b>					
			Smooth 3 wheeled steel roller @ 30cum/hour	hour	12.000	604.00	7248.00	P&M-044
			Water tanker 6 KL capacity	hour	24.000	154.00	3696.00	P&M-060
			c) <b>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	382.30	166529.88	M-039
			<b>Stone Screening</b>					
			Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	452.61	43993.69	M-042
			OR					
			Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	127.69	13790.52	M-007
			<b>Binding material</b>					
			Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	127.69	3677.47	M-007
			Cost of water	KL	144.000	225.00	32400.00	M-189
4.9A (i)			<b>Using Scriming Crushable type such as Moorum or Gravel</b>					
		(a)	d) Overhead charges @ 0.1 on (a+b+c)				26503.81	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				29154.19	
			Cost for 360 cum = a+b+c+d+e				320696.08	
			Rate per cum = (a+b+c+d+e)/360				890.82	
							<i>say</i>	<u>891.00</u>
			OR					
4.9A (i)			<b>Using Scriming Type-A (13.2mm agg.)</b>					
		(b)	d) Overhead charges @ 0.1 on (a+b+c)				29891.87	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				32881.06	
			Cost for 360 cum = a+b+c+d+e				361691.66	
			Rate per cum = (a+b+c+d+e)/360				1004.70	
							<i>say</i>	<u>1005.00</u>
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	412.26	179580.46	M-038
			<b>Stone Screening</b>					
			Type A 13.2 mm for grading-II @ 0.12 cum per 10 sqm	cum	57.600	452.61	26070.34	M-042
			OR					

**Sub - Analysis\_B**

			Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	127.69	13482.79	M-007	
			OR						
			Type B11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	333.95	28853.28	M-041	
			Binding material						
			Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	127.69	3677.47	M-007	
			Cost of water	KL	144.000	225.00	32400.00	M-189	
4.9A (ii)			<b>Using Scrining Crushable type such as Moorum or Gravel</b>						
	(a)	d)	Overhead charges @ 0.1 on (a+b+c)				27778.09		
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				30555.90		
			Cost for 360 cum = a+b+c+d+e				336114.92		
			Rate per cum = (a+b+c+d+e)/360				933.65		
							say	<u>934.00</u>	
			OR						
4.9A (ii)			<b>Using Scrining Type-A (13.2mm agg.)</b>						
	(b)	d)	Overhead charges @ 0.1 on (a+b+c)				29404.59		
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				32345.05		
			Cost for 360 cum = a+b+c+d+e				355795.59		
			Rate per cum = (a+b+c+d+e)/360				988.32		
							say	<u>988.00</u>	
4.9A (ii)			<b>Using Scrining Type-B (11.2mm agg.)</b>						
	(c)	d)	Overhead charges @ 0.1 on (a+b+c)				29682.89		
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				32651.18		
			Cost for 360 cum = a+b+c+d+e				359162.95		
			Rate per cum = (a+b+c+d+e)/360				997.67		
							say	<u>998.00</u>	
4.9A			<b>Grading-III</b>						
	(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	441.36	192256.42	M-036	
			Stone Screening						
			Type B 11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	333.95	28853.28	M-041	
			OR						
			Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	127.69	13482.79	M-007	
			Binding material						
			Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	127.69	3677.47	M-007	
			Cost of water	KL	144.000	225.00	32400.00	M-189	
4.9A (iii)			<b>Using Scrining Crushable type such as Moorum or Gravel</b>						
	(a)	d)	Overhead charges @ 0.1 on (a+b+c)				29045.69		
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				31950.26		
			Cost for 360 cum = a+b+c+d+e				351452.83		
			Rate per cum = (a+b+c+d+e)/360				976.26		
							say	<u>976.00</u>	
			OR						
4.9A (iii)			<b>Using Scrining Type-B (11.2mm agg.)</b>						
	(b)	d)	Overhead charges @ 0.1 on (a+b+c)				30950.48		
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				34045.53		
			Cost for 360 cum = a+b+c+d+e				374500.87		
			Rate per cum = (a+b+c+d+e)/360				1040.28		
							say	<u>1040.00</u>	
			( Anyone of the aggregate grading, screening and binding material may be used as per design)						

**Sub - Analysis\_B**

4.9			By Mechanical Means:					
SUB ANA-B		B	<i>Unit = cum</i>					
			<i>Taking output = 360 cum</i>					
			a) Labour					
			Mate	day	0.680	171.00	116.28	L-12
			Mazdoor skilled	day	2.000	200.00	400.00	L-15
			Mazdoor	day	15.000	157.00	2355.00	L-13
			b) Machinery					
			Motor grader 110 HP @ 50cum/hr. for spreading	hour	7.200	2435.00	17532.00	P&M-032
			Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000	604.00	7248.00	P&M-044
			Water tanker 6 KL capacity	hour	24.000	154.00	3696.00	P&M-060
			c) Material ( Refer table 400 - 7, 8 & 9 )					
4.9B			Grading - I					
		(i)	Aggregate					
			Grading-I 90 mm to 45 mm@ 1.21cum per 10 sqm for compacted thickness of 100 mm	cum	435.600	382.30	166529.88	M-039
			Stone Screening					
			Type A 13.2 mm for grading-I @ 0.27 cum per 10 sqm	cum	97.200	452.61	43993.69	M-042
			OR					
			Crushable type such as Moorum or Gravel for grading-I @ 0.30 cum per 10 sqm	cum	108.000	127.69	13790.52	M-007
			Binding material					
			Binding Material @ 0.08cum per 10 sqm for grading I material	cum	28.800	127.69	3677.47	M-007
			Cost of water	KL	144.000	225.00	32400.00	M-189
4.9B (i)			Using Scriming Crushable type such as Moorum or Gravel					
		(a)	d) Overhead charges @ 0.1 on (a+b+c)				24406.77	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				26847.44	
			Cost for 360 cum = a+b+c+d+e				295321.89	
			Rate per cum = (a+b+c+d+e)/360				820.34	
							<i>say</i>	<u>820.00</u>
			OR					
4.9B (i)			Using Scriming Type-A (13.2mm agg.)					
		(b)	d) Overhead charges @ 0.1 on (a+b+c)				27794.83	
			e) Contractor's profit @ 0.1 on (a+b+c+d)				30574.32	
			Cost for 360 cum = a+b+c+d+e				336317.47	
			Rate per cum = (a+b+c+d+e)/360				934.22	
							<i>say</i>	<u>934.00</u>
4.9B			Grading - II					
		(ii)	Aggregate					
			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	412.26	179580.46	M-038
			Stone Screening					
			Type A 13.2 mm for grading-II@ 0.12 cum per 10 sqm	cum	57.600	452.61	26070.34	M-042
			OR					
			Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	127.69	13482.79	M-007
			OR					
			Type B11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	333.95	28853.28	M-041

**Sub - Analysis\_B**

			Binding material					
			Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	127.69	3677.47	M-007
			Cost of water	KL	144.000	225.00	32400.00	M-189
4.9B (ii)			Using Scrining Crushable type such as Moorum or Gravel					
	(a)	d)	Overhead charges @ 0.1 on (a+b+c)				25681.05	
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				28249.16	
			Cost for 360 cum = a+b+c+d+e				310740.73	
			Rate per cum = (a+b+c+d+e)/360				863.17	
							say	<u>863.00</u>
			OR					
4.9B (ii)			Using Scrining Type-A (13.2mm agg.)					
	(b)	d)	Overhead charges @ 0.1 on (a+b+c)				27307.55	
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				30038.31	
			Cost for 360 cum = a+b+c+d+e				330421.41	
			Rate per cum = (a+b+c+d+e)/360				917.84	
							say	<u>918.00</u>
4.9B (ii)			Using Scrining Type-B (11.2mm agg.)					
	(c)	d)	Overhead charges @ 0.1 on (a+b+c)				27585.85	
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				30344.43	
			Cost for 360 cum = a+b+c+d+e				333788.77	
			Rate per cum = (a+b+c+d+e)/360				927.19	
							say	<u>927.00</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	441.36	192256.42	M-036
			Stone Screening					
			Type B11.2 mm for grading-III @ 0.18 cum per 10 sqm	cum	86.400	333.95	28853.28	M-041
			OR					
			Crushable type such as Moorum or Gravel for grading II & III @ 0.22 cum per 10 sqm	cum	105.590	127.69	13482.79	M-007
			Binding material					
			Binding Material @ 0.06cum per 10 sqm for grading II material	cum	28.800	127.69	3677.47	M-007
			Cost of water	KL	144.000	225.00	32400.00	M-189
4.9B (iii)			Using Scrining Crushable type such as Moorum or Gravel					
	(a)	d)	Overhead charges @ 0.1 on (a+b+c)				26948.65	
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				29643.51	
			Cost for 360 cum = a+b+c+d+e				326078.64	
			Rate per cum = (a+b+c+d+e)/360				905.77	
							say	<u>906.00</u>
			OR					
4.9B (iii)			Using Scrining Type-B (11.2mm agg.)					
	(b)	d)	Overhead charges @ 0.1 on (a+b+c)				28853.44	
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				31738.79	
			Cost for 360 cum = a+b+c+d+e				349126.68	
			Rate per cum = (a+b+c+d+e)/360				969.80	
							say	<u>970.00</u>



**Sub - Analysis\_B**

4.10	405		<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.					
			<i>Unit = cum</i>					
			<i>Taking output =360 cum</i>					
			<b>a) Labour</b>					
			Mate	day	4.160	171.00	711.36	L-12
			Mazdoor skilled	day	2.000	200.00	400.00	L-15
			Mazdoor for crushing broken cement concrete pavement/slabs into aggregate	day	102.000	157.00	16014.00	L-13
			<b>b) Machinery</b>					
			Motor Grader,110 HP @ 50 cum/hr.	hour	6.000	2435.00	14610.00	P&M-032
			Smooth 3 wheeled steel roller @ 30cum/hr.	hour	12.000	604.00	7248.00	P&M-044
			Front end loader 1 cum bucket capacity	hour	6.000	1071.00	6426.00	P&M-017
			Tipper 10 tonne capacity	tonne.km	720 x L	6.85	4932.00	Lead =1 km & P&M-047
			Add 10 per cent of cost of carriage to cover cost of loading and unloading				493.20	
			Water tanker 6 KL capacity with 5 km lead @ 1 trip per hour	hour	12.000	154.00	1848.00	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	225.00	16200.00	M-189
			<b>d) Overhead charges @ 0.1 on (a+b+c)</b>				6888.26	
			<b>e) Contractor's profit @ 0.1 on (a+b+c+d)</b>				7577.08	
			Cost for 360 cum = a+b+c+d+e				83347.90	
			Rate per cum = (a+b+c+d+e)/360				231.52	
			<b>With Smooth 3 wheeled Steel Roller</b>			say	<u>232.00</u>	
			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.					
		Note	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.					
			<i>Unit = cum</i>					
			<i>Taking output = 225 cum (495 tonnes)</i>					
			<b>a) Labour</b>					
			Mate	day	0.480	171.00	82.08	L-12
			Mazdoor skilled	day	2.000	200.00	400.00	L-15
			Mazdoor	day	10.000	157.00	1570.00	L-13
			<b>b) Machinery</b>					
			Wet mix plant of 75 tonne hourly capacity	hour	6.600	2297.00	15160.20	P&M-094
			Electric generator 125 KVA	hour	6.000	2062.00	12372.00	P&M-018
			Front end loader 1 cum capacity	hour	6.000	1071.00	6426.00	P&M-017
			Paver finisher	hour	6.000	1123.00	6738.00	P&M-035
			Smooth 3 wheeled steel roller @ 8-10 tonnes.	hour	12.000	604.00	7248.00	P&M-044
			Water tanker 6 KL capacity	hour	3.000	154.00	462.00	P&M-060

**Sub - Analysis\_B**

		Tipper	tonne.km	495 x L	6.85	3390.75	Lead =1 km & P&M-047
		Add 10 per cent of cost of carriage to cover cost of loading and unloading				339.08	
		c) Material ( Table 400-11)					
		45 mm to 22.4 mm@ 30 per cent	cum	89.100	461.26	41098.27	M-034
		22.4 mm to 2.36 mm @ 40 per cent	cum	118.800	507.98	60348.02	M-031
		2.36 mm to 75 micron@ 30 per cent	cum	89.100	181.88	16205.51	M-022
		Cost of water	KL	18.000	225.00	4050.00	M-189
		d) Overhead charges @ 0.1 on (a+b+c)				17588.99	
		e) Contractor's profit @ 0.1 on (a+b+c+d)				19347.89	
		Cost for 225 cum = a+b+c+d+e				212826.78	
		Rate per cum = (a+b+c+d+e)/225				945.90	
		<b>With Smooth 3 wheeled Steel Roller</b>			say	<b>946.00</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.					
	Note	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	Brick Masonry Work in Cement Mortar 1:2 in Foundation complete excluding Pointing and Plastering, as per Drawing and Technical Specifications.					
SUB ANA -B		<i>Unit = cum</i>					
		<i>Taking output = 5 cum</i>					
		a) Material					
		Bricks 1st class	each	2500.00	5.636	14090.00	M-079
		Cement mortar 1:2 (Rate as in Item 12.6 B sub-analysis)	cum	1.20	3943.00	4731.60	Item 12.6 (B)
		b) Labour					
		Mate	day	0.48	171.00	82.08	L-12
		Mason	day	4.00	213.00	852.00	L-11
		Mazdoor	day	8.00	157.00	1256.00	L-13
		c) Overhead charges @ 0.25 on (a+b)				5252.92	
		d) Contractor's profit @ 0.1 on (a+b+c)				2626.46	
		Cost for 5 cum = a+b+c+d				28891.06	
		Rate per cum (a+b+c+d)/5				5778.21	
					say	<b>5778.00</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.					
SUB ANA -B		<i>Unit = cum</i>					
		<i>Taking output = 5 cum</i>					
		a) Material					
		Bricks 1st class	each	2500.00	5.636	14090.00	M-079
		Cement mortar 1:4 (Rate as in Item 12.6 C sub-analysis)	cum	1.20	2482.00	2978.40	Item 12.6 (C)
		b) Labour					
		Mate	day	0.48	171.00	82.08	L-12
		Mason	day	4.00	213.00	852.00	L-11
		Mazdoor	day	8.00	157.00	1256.00	L-13
		c) Overhead charges @ 0.25 on (a+b)				4814.62	
		d) Contractor's profit @ 0.1 on (a+b+c)				2407.31	
		Cost for 5 cum = a+b+c+d				26480.41	
		Rate per cum (a+b+c+d)/5				5296.08	
					say	<b>5296.00</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.					

**Sub - Analysis\_B**

SUB ANA -B			<i>Unit = cum</i>					
			<i>Taking output = 5 cum</i>					
		a)	Material					
			Bricks 1st class	each	2500.00	5.636	14090.00	M-079
			Cement mortar 1:6 (Rate as in Item 12.6 D sub-analysis)	cum	1.20	1899.00	2278.80	Item 12.6 (D)
		b)	Labour					
			Mate	day	0.48	171.00	82.08	L-12
			Mason	day	4.00	213.00	852.00	L-11
			Mazdoor	day	8.00	157.00	1256.00	L-13
		c)	Overhead charges @ 0.25 on (a+b)				4639.72	
		d)	Contractor's profit @ 0.1 on (a+b+c)				2319.86	
			Cost for 5 cum = a+b+c+d				25518.46	
			Rate per cum (a+b+c+d)/5				5103.69	
							<i>say</i>	<b>5104.00</b>
3.19	305.3.4		Rolling, watering and compaction with Smooth Wheeled Roller					
SUB ANA -B			<i>Unit = cum</i>					
			<i>Taking output = 600 cum</i>					
		a)	Labour					
			Mate	day	0.120	171.00	20.52	L-12
			Mazdoor	day	3.000	157.00	471.00	L-13
		b)	Machinery					
			Water tanker 6 KL capacity	hour	4.000	154.00	616.00	P&M-060
			Smooth wheel roller 8-10 tonnes @ 56 cum per hour	hour	10.710	604.00	6468.84	P&M-044
		c)	Material					
			Cost of water	KL	24.000	225.00	5400.00	M-189
		d)	Overhead charges @ 0.1 on (a+b+c)				1297.64	
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				1427.40	
			Cost for 600 cum = a+b+c+d+e				15701.40	
			Rate per cum = (a+b+c+d+e)/600				26.17	
							<i>say</i>	<b>26.00</b>
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					
			<i>Unit = cum</i>					
			<i>Taking output = 10 cum</i>					
		B	Sandy material					
		a)	Labour					
			Mate	day	0.28	171.00	47.88	L-12
			Mazdoor for filling, watering, ramming etc.	day	7.00	157.00	1099.00	L-13
		b)	Material					
			Sand (Coarse)	cum	12.00	133.28	1599.36	M-004
		c)	Machinery					
			Plate compactor/power rammer	hour	2.50	392.00	980.00	P&M-086
			Water Tanker	hour	0.06	154.00	9.24	P&M-060
		d)	Overhead charges @ 0.25 on (a+b+c)				933.87	
		e)	Contractor's profit @ 0.1 on (a+b+c+d)				466.94	
			Cost for 10 cum of sandy backfill = a+b+c+d+e				5136.29	
			Rate per cum = (a+b+c+d+e)/10				513.63	
							<i>say</i>	<b>514.00</b>