

**ODISHA CONSTRUCTION CORPORATION LTD.
(A Govt. of Odisha Undertaking)**

Mahanadi Birupa Group of Projects, Cuttack

TENDER DOCUMENT

Tender call notice No. 01/26-27/OCCL/MBGP/2026-27 Dt.04.07.2026

(Percentage Rate Tender)

TECHNICAL BID (COVER-I)

Name of work:-

**Improvement to Chitrotpala left embankment
from RD 22.700Km to 24.200Km**

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Odisha Construction Corporation Ltd.
Mahanadi Birupa Group of Projects, Cuttack

Particulars of payment of Tender document cost
(To be filled up by the Bidder)

Tender call notice No. 01/26-27/OCCL/MBGP/2026-27, Dt.04.07.2026

Full name & address of Jobworker/ Bidder:-

Telephone No. – Land line :

Mobile :

e-mail ID:

OCC Enlistment No. of Jobworker/ Bidder:

Amount paid by Jobworker/ Bidder towards cost of

Tender Document : Rs.11,800.00 (Rupees Eleven Thousand Eight hundred) only.

Demand Draft No. _____ dt. _____

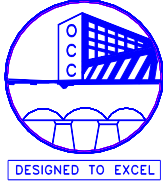
Issued by _____ (Bank) in favour of “Odisha
Construction Corporation Ltd” payable at “Cuttack”.

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SENIOR MANAGER (C)

SECTION-I

TENDER CALL NOTICE



ODISHA CONSTRUCTION CORPORATION LTD.

(A Government of Odisha Undertaking)

Office of the General Manager (Civil),

Central Zone,

Plot No.1143, Vinayak Nagar, Mahanadivihar,

Cuttack-04, Odisha (India)

Lr. No. OCCL/GMCZ/256/

Dt.04/07/2026

TENDER CALL NOTICE

NOTICE NO.01/26-27/OCCL/MBGP/2026-27, Dt. 04/07/2026

- The General Manager (Civil), Central Zone, OCCL, Cuttack on behalf of Odisha Construction Corporation Ltd. ("OCCL") invites sealed tender on percentage rate basis from the eligible class of C-I enlisted Job Worker/Contractor in OCC Ltd. If not, enlisted agency is to get enlisted in OCC Ltd as C-I class of Job Worker/Contractor preferably before submission of tender but Mandatory before drawl of agreement.

Sl. No	Name of the work	Approximate Value of Work (Excluding GST) (Rupees in Lakhs)	EMD	Cost of Tender Document + GST@ 18% in Rs. (Nonrefundable)	Period of Completion	Class of Job-worker
1	Improvement to Chitrotpala left embankment from RD 22.700Km to 24.200Km	Rs.108.56 Lakhs	Rs.1,08,600.00	Rs. 10,000.00 + GST @ 18% i.e. Rs.1,800.00 = Rs. 11,800.00	06 (Six) Months	C-I

- The tender document can be obtained from office of the Senior Manager (Civil), OCC Ltd., Mahanadi Birupa Group of Projects, Cuttack during office hour from **Dt. 04.07.2026 to Dt.13.07.2026 up to 1.00 PM**. The Bidder (Job-worker) have to deposit the nonrefundable cost of tender paper specified for the work in the table as above in shape of Cash / Demand Draft from any Nationalized / Scheduled Bank operative in Odisha, payable at Cuttack in favour of Odisha Construction Corporation Ltd. The Tender notice shall also be available on **OCCL website at www.odishaconstruction.com**. Interested Bidders may obtain further information, if any, from the undersigned.
- The bidder must be accompanied with EMD (Earnest Money Deposit) of the amount specified for the work in the table as above in shape of Demand Draft / TDR in favour of Odisha Construction Corporation Limited payable at Cuttack and should be valid for 90(Ninety) days from the date of opening of tender.
- The tender is to be dropped in the tender box kept in the office of the Senior Manager (Civil), OCCL, Mahanadi Birupa Group of Projects, Cuttack in a cover containing Cover-I & Cover-II.

Cover- I is to contain the tender cost, EMD, copy of valid enlistment certificate as Contractor/job-worker issued by "OCCL", copy of PAN card, copy of valid GST registration certificate, Copy of No. relation Certificate, Undertaking to pay Minimum Wages, Undertaking to Pay Royalty, Affidavit in support of genuineness certificate and any other document required as per the relevant clauses of DTCN if any. The cover is to be sealed and super scribed as Cover – I (Technical Bid) and name of the work.

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Cover – II is to contain the price bid duly filled in and signed by the bidder along with additional performance security if any and is to be super scribed as **Cover – II (Price Bid)** and name of the work.

Both the covers are then to be kept inside a third cover duly sealed and super scribed with the name of the work. In order to ensure that the envelopes are properly sealed, the contractor can seal them with superglue and also add tamper proof tapes as additional precaution.

5. The bidders are not required to write their name on the outer cover containing the bid documents (Cover-I & II). They are only required to write the name of work and the authority inviting the bid.
6. The tender must be submitted at the office of the Senior Manager (Civil), OCC Ltd., Mahanadi Birupa Group of Projects, Cuttack on or before **3.30PM on dated. 13.07.2026**. The **Cover-I (Technical Bid)** will be opened on Dt.13.07.2026 at **4.00 PM** in the same venue in presence of the bidders or their authorized representatives, who may like to be present. If there will be a public holiday on the last date of receipt & opening of the tenders as specified above, the tender documents shall be received & opened on the next working day at the same time & venue. Date, time and place of opening of **Cover- II (Price Bid)** shall be intimated separately to those bidders who will be found eligible after evaluation of Technical Bids. Cover-II containing the price bid shall be returned unopened to the unsuccessful bidders after completion of the tender process.
7. Additional Performance Security shall be submitted by the bidder when the bid amount is less than the estimated cost put to tender. In such an event, only the successful bidder who has quoted less bid price/rates than the estimated cost put to tender shall have to furnish an amount as stipulated below towards Additional Performance Security (APS) in shape of Demand Draft in favour of “Odisha Construction Corporation Ltd.” payable at Cuttack within seven days of issue of Letter of Acceptance (LoA) by Odisha Construction Corporation Limited (by email) to the successful bidder otherwise the bid of the successful bidder shall be cancelled and further proceedings for blacklisting shall be initiated against the bidder.

As per the Works Department OM No.07764600022025/173/W, Dt.03.01.2026 & OM No.07764600022025/632/W, Dt.09.01.2026 the agency has to deposited the APSD as per the following guidelines.

- I) **Whether the bid price is below 0% but not below 10% of the project cost put to bid**, no additional performance guarantee/security percentage is required.
 - II) **Whether the bid price is below 10% but not below 20% of the project cost put to bid**, the additional performance guarantee/security percentage shall be incremented by 0.10% for every percentage of bid price below 10% of the project cost put to bid starting at 11% with the additional bid performance guarantee being 0.10% and this additional performance guarantee percentage shall be applied on the bid price.
 - III) **Whether the bid price is below 20% or more below of the project cost put to bid**, the additional performance guarantee percentage shall be incremented by 0.20% for every percentage of bid price below 20% of the project cost put to bid in addition to 1% of bid price and this additional performance guarantee percentage shall be applied on the bid price.
 - IV) The additional performance guarantee percentage shall be rounded off to the next lower percentage based on whether the decimal point of the percentage of bid price is below 0.5% or next higher percentage based on whether the decimal point of the percentage of bid price is 0.5% of more.
8. The bidder shall have to furnish an affidavit in support of the authenticity/ genuineness of the documents/certificates and credentials along with the tender document. In case of production of forged document, the penalty shall be rejection of their tender and cancellation of their enlistment with the Corporation. The authority reserves the right to verify the authenticity of documents in case of any doubt or complain.

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9. The tender received will remain valid for 90 (Ninety) days from the date of receipt of tender and the validity of tender can also be extended if agreed to by the bidder and OCCL.
10. The Job- Worker are to quote the % (percentage) excess or less or at par of the amount put to tender in the bill of quantity in the format enclosed with the tender document. For evaluation, the amount quoted in words shall be taken, if there is any difference in figure and words in tender document. If more that one bid is quoted (decimal up to two numbers will be taken for all practical purpose), either at the estimated cost put to tender or less than the estimated cost put to tender, the tender accepting authority will finalize the tender through a transparent lottery system, where all the concerned bidders. Their authorized representatives, the Senior Manager (Civil) / authorized person of Senior Manager (Civil) will remain present.

If the rate quoted by the SE and ST category Contractors comes to the rate quoted by the L1 bidder (decimal up to two numbers will be taken for all practical purposes) after availing 10% price preference as per para 2 of Works Department Resolution No.27748, Dtd.11.10.1977, the tender shall be finalized by the tender accepting authority through a transparent lottery system along with other categories of contractors.
11. The successful Job-Worker shall have to execute the work as per scope of work, Methodology of work, technical specifications & price schedule as per direction of Engineer-in-charge and terms & conditions of agreement. The J/W (successful Bidder) has to submit work schedule for approval before drawal of Agreement.
12. The authority reserves the absolute right to accept or reject any or all tender and to split up work to award one or more Job-workers without assigning any reason thereof.
13. Any dispute arising out of the above tender call notice shall be subject to Jurisdiction of Hon'ble High Court of Odisha at Cuttack and their sub-ordinate courts at Bhubaneswar only.

For Odisha Construction Corporation Ltd.

Sd/-
General Manager (Civil)

Memo No. OCCL/GMCZ/ 257 (2) /

Dt. 04 / 07 /2026

Copy submitted to the Managing Director, OCC Ltd., Gopabandhu Nagar, BBSR / General Manager (Civil), Head Office, OCC Ltd., Gopabandhunagar, BBSR for favour of kind information and necessary action.

Sd/-
General Manager (Civil)

Memo No. OCCL/GMCZ/ 258 (WE) /

Dt. 04 / 07 /2026

Copy along with soft copy forwarded to the Senior Manager (Civil), System Business Division, OCCL, Bhubaneswar for information. He is requested to hoist the tender call notice in website of OCCL.
(By email - nanda8038@yahoo.com)

Sd/-
General Manager (Civil)

Memo No. OCCL/GMCZ/ 259 (2)(WE) /

Dt. 04 / 07 /2026

Copy to Notice Board of Senior Manager (Civil), OCC Ltd., Mahanadi Birupa Group of Projects, Cuttack / Senior Manager (Civil), OCC Ltd., Cuttack Group of Projects, Cuttack for wide circulation.

Sd/-
General Manager (Civil)

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SECTION-II

EMD & OTHER DOCUMENTS

EMD and document deposit particulars

(To be filled up by the Bidder)

DETAILS OF EARNEST MONEY DEPOSIT (EMD), AND DOCUMENTS SUBMITTED ALONG WITH TENDER

1. EMD amount Rs. _____ (Rupees _____) only vide DD / TDR No. _____, Dated _____ issued by _____ Bank, _____ Branch in favour of Odisha Construction Corporation Ltd payable at Cuttack.
2. GSTIN Certificate
3. P.A.N. card
4. Any other documents. (As per Tender Call Notice)

Full signature of “Quotationer” with date and seal

FORM OF AFFIDAVIT**AFFIDAVIT**

I,, son of
 do hereby solemnly affirm as follows :

- i) That, I/We, am/are enlisted with OCC Ltd. as Bidder/agency under category and my/ our Enlistment No. is valid up to
- ii) I/We have submitted tender for the work “**Improvement to Chitrotpala left embankment from RD 22.700Km to 24.200Km**” as per terms and conditions of the tender document.
- iii) I/We have thoroughly understood the terms and conditions and provisions of the tender document and accordingly have quoted the amount. I/We understand that the quoted amount will remain firm and binding on me/us throughout the construction period of the work and no price escalation will be payable to me/us.
- iv) I/We have inspected the site, examined the site and working conditions and have thoroughly appraised myself/ourselves about all aspects of the work and the involvements/difficulties / bottlenecks. I/We will not raise any claim on account of this or any information not being available with me/us before quoting.
- v) I/We hereby undertake that I/We being an enlisted agency of OCC Ltd. will not raise any dispute/litigation in respect of execution of the work or on any issue with the Corporation in the event of the work being awarded to us and in all such issues the decision of the management of OCC Ltd. will be final and binding on us.
- vi) I am authorized on behalf of Bidder to tender for the work/works mentioned above.
- vii) I am swearing in this affidavit that all the information's furnished in the Tender documents and accompanying papers, those being submitted by me are all authentic and bonafied in the eyes of the law of the land.

That, the facts stated in the affidavit are true to the best of my knowledge and belief.

(Signature of Bidder)

Name :

Address :

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SENIOR MANAGER (C)

CERTIFICATE OF NO-RELATIONSHIP

I/We hereby certify that I/We* am/ are* related/ not related* to any officer of Odisha Construction Corporation Ltd. of the rank of Manager & above and any officer of the rank of Assistant Executive Engineer / Under Secretary and above of the Water Resources Department, Govt. of Odisha I/We* am/are* aware that, if the facts subsequently proved to be false, my/our* contract will be rescinded with forfeiture of E.M.D and security deposit and I/We* shall be liable to make good the loss or damage resulting from such cancellation.

I/We also note that, non-submission of this certificate will render my / our Bid liable for rejection.

Signature of the Bidder

** Strike out which is not applicable*

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UNDERTAKING TO PAY MINIMUM WAGES

We do hereby undertake that, we shall pay wages of each labour at the rate not less than the wages as per Minimum Wages Act in force during the time of execution and as may be amended from time to time. The “Engineer-in-Charge” has the right to enquire into and decide on any complaint of the Labourers relating to non-payment or less payment of wages to them and his decision will be final and binding on us.

Signature of the Bidder

Name _____

Address _____

Date : _____

UNDERTAKING TO PAY ROYALTY+DMF+EMF+Additional Charges

We do hereby undertake that, Royalty+DMF+EMF+Additional Charges for stone products, sand, moorum and Borrow earth etc. are to be recovered from the work bills as per prevailing Govt. Notification during the time of execution.

Signature of the Bidder

Name _____

Address _____

Date : _____

SECTION-III

GENERAL TERMS & CONDITIONS

GENERAL TERMS AND CONDITIONS

1. DEFINITIONS

- (i) **“CORPORATION”** means **“ODISHA CONSTRUCTION CORPORATION LTD. (“OCCL” in short)”** with registered office at Unit-8, Gopabandhu Nagar, Bhubaneswar – 751 012 (Odisha) represented through its Managing Director or any other officer as designated by the “Corporation” from time to time.
- (ii) **“ENGINEER-IN-CHARGE”** means the engineer of the “Corporation” who will be in the charge of the work.
- (iii) **“BIDDER”** means the enlisted Jobworker/person/firm/organisation having men, machinery, materials etc. to execute the work satisfactorily as per scope indicated herein within stipulated period.
- (iv) **“CLIENT”** means the State Govt. or Central Govt. organization or any individual from whom “OCCL” has received the work for execution.

2. AGREEMENT

The “Bidder” shall enter into an agreement with the “Engineer-in-Charge” in the format on requisite value of stamp paper prescribed for the purpose by the “Corporation” within a stipulated period to be specified by the “Engineer-in-Charge” failing which the EMD and ISD shall be forfeited. The work may be awarded in favour of some other agency at the discretion of the “Corporation”.

3. RATE

The rate quoted by the bidder is to be indicated in % (Percentage) excess or less or at par of the total amount of the estimated value of work put to tender, which shall be valid for the full period of execution or till completion of work whichever is later. No escalation or price variation in whatsoever form shall be entertained. The % (Percentage) excess or less or at par quoted by the “Jobworkers” should be firm for the entire period of execution.

The “Jobworker” shall quote the rate in % (Percentage) excess or less or at par of total amount put to tender to complete the works as per specifications inclusive of all transportation, handling, loading, unloading, lift, de-lift, taxes, duties, levies, incidental expenses etc. that will be applicable on the work to be executed by him. No claim in this regard in whatsoever form shall be entertained.

4. PAYMENT TERMS

- (i) No advance shall be paid for the work. The rate shall remain firm throughout the agreement period.
- (ii) The payment to the “Bidder” shall be limited to the measurements taken and accepted by the client. The “Bidder” cannot raise any dispute over the measurements allowed by the “Engineer-in-Charge” for the purpose of payment.
- (iii) The Bidder will bear the full cost of rectification or replacement of works required as per direction of “Client” or “Engineer-in-Charge”.
- (iv) Any penalty levied by “Client” on “OCCL” due to delay in work will be borne by the “Bidder” in full, if the “Bidder” is responsible for delay.
- (v) The Agreement rate of the Jobworker shall be exclusive of GST. GST as applicable shall be paid extra over and above the Running account bills on production of GST invoice.
- (vi) Price adjustment/price variation as per Govt Circular, 2019 shall be applicable to the agreement with a condition that the same is accepted by the client. No claim towards price adjustment/Price variation will be entertained prior receipt of the same from the client.

5. INITIAL SECURITY DEPOSIT (ISD)

The “Bidder” shall deposit Initial Security Deposit (ISD) at the rate of 2(Two) % of the work/agreement value on receipt of letter of intent of work within a period of 07 days from the date of issue but before execution of agreement. After receipt of the full ISD, the EMD received along with the tender shall be returned.

If the bidder desires, the EMD can be converted to ISD and the balance amount of ISD has to be deposited. If the “Bidder” fails to deposit such initial security within the stipulated date, the EMD of the “Bidder” shall be forfeited and the work may be awarded in favour of some other agency at the discretion of the “Corporation”. The ISD will be released after completion of the work and settlement of the final bill for the contractor.

6. SECURITY DEPOSIT (SD) .

The Security Deposit (SD) at the rate of 5 (Five) % shall be deducted on the gross amount of each bill of the “Job-Worker”. The security will be released after 12(twelve) months of completion of the work or settlement of final bill of the “Job-Worker”, whichever is later, if no defect in the work is noticed and material account as well as all disputes including compliance of labour rules, ESI rules etc. are settled.

7. ADDITIONAL SECURITY DEPOSIT

The “Engineer-in-Charge” may, if he feels it necessary can deduct and withhold from the bill of the “Job-Worker” a sum not exceeding 10% and not less than 5% of the gross value of work done as additional security deposit for the rectification of defective and /or unsatisfactory work.

The additional Security Deposit shall be deducted in addition to normal security deposit. Such defects shall be rectified by the “Job-Worker” within such period as the “Engineer-in-Charge” may fix-up and if the “Job-Worker” fails to rectify the defects within the specified period, this shall be rectified by the “Engineer-in-Charge” at the cost and risk of the “Job-Worker”

The expenses so incurred in the rectification of the defective works and/or unsatisfactory work done by the “Job-Worker” shall be recovered from the bills or any other dues of the “Job- Worker” or otherwise as per law. In this connection, the decision of the “Engineer-in-Charge” shall be final and binding on the “Job-Worker”. The additional security deposit shall be released in full, when the “Job-Worker” rectifies the defects in time at his cost.

8. WITH HELD AMOUNT FOR EPF, FPF AND ESI DUES

2(Two) % shall be deducted and kept withheld from R.A. bills of the “Job-Worker” towards EPF, FPF and ESI dues. If the “Job-Worker” produces clearance in support of deposit of EPF, FPF and ESI dues with the concerned authority within 3(Three) months from the end of each financial year, the above withheld amount shall be released. Otherwise, the “Corporation” shall deposit the same with Provident Fund Authority and ESI Authority. Penalty, if any, shall be recovered from the “Job-Worker”.

9. INCOME TAX, GST, CESS OTHER TAXES, DUTIES, LEVIES ETC.

Income tax at the prevailing rate from time to time will be deducted from each bill of the “Job- Worker” and shall be deposited with Income Tax Authorities. GST applicable on purchased items and services rendered there of shall be released as per norms. All taxes, such as income tax, labour cess, fees, royalties payable under the local rule excluding GST as applicable will be borne by the Jobworker. GST will be paid to the Jobworker as per the prevailing rules.

10. OPTIMUM USE OF MACHINERY, VEHICLES, EQUIPMENTS, TOOLS, TACKLES, CONSUMABLES AND STEEL MATERIALS

The “Bidder” shall ensure optimum utilisation of the plants, machinery, equipments, tools, tackles, consumables, cement, steel materials etc. and shall not create any hindrance for others. The decision of the “Engineer-in-Charge” regarding the optimum requirement shall be final and binding on the “Bidder”.

11. RECORD OF MATERIALS, CONSUMABLES, MACHINERY, EQUIPMENTS, TOOLS, TACKLES ETC.

The “Bidder” shall be responsible for maintaining the data and complete records of issue and consumption of materials and consumables as well as record of plants, machinery, equipments, tools, tackles, cement, steel materials etc. issued to him by the owner and “Corporation”. The materials, plants, machinery, equipments, tools, tackles cement, steel materials etc. shall be issued as per requirement and availability only.

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If the materials supplied by the “Corporation” will be received by the “Bidder” from the “Corporation” store on submission of indent by the “Engineer-in-Charge”. Transportation of materials to site of work and storage at site are the responsibility of the “Bidder”.

The “Bidder” will keep an accurate record of “Corporation” materials and furnish the consumption statement of such materials. The surplus materials, if any, are to be returned to the “Corporation” store at his cost failing which, the cost of excess materials will be recovered from the dues of the “Bidder” @ 5(Five) times the issue rate of “OCCL” or market rate, whichever is higher.

12. RETURN OF PLANTS, MACHINERY, EQUIPMENTS, TOOLS, TACKLES, MATERIALS, CONSUMABLES ETC.

The plants, machinery, equipments, tools, tackles, excess cement, excess steel materials, excess consumables etc. of the “Corporation” are to be returned by the “Bidder” in good working condition after completion of the work/termination of the contract by the “Corporation”. The “Corporation” may hire plants, machinery, equipments, tools, tackles etc. from the owner as well as outside for use in work. The same are also to be returned by the “Bidder” in acceptable good working condition with original fittings after completion of the work/termination of the contract by the “Corporation”.

Any damage to/ by the plants, machinery, equipments, tools, tackles etc. during use by the “Bidder” shall be booked to the “Bidder” for recovery from his bills.

The balance unused/excess cement, steel materials, balance consumables etc. of the “Corporation”, if any, shall be returned by the “Bidder” in good condition at specified places as per direction of the “Engineer-in-Charge” failing which the cost at 5(Five) times the market rate shall be deducted from the “Bidder”.

13. EMPTY CEMENT BAGS AND SCRAP STEEL MATERIALS/CUT PIECE RODS

The cost of empty cement bags against cement issued by “OCCL” shall be deducted by “OCCL” from the bills/dues of the “Bidder” as per applicable rate.

The steel if issued by ‘OCCL’, the entire cost of the same will be deducted from the bills of the Jobworker.

14. ELECTRICITY

Electricity required for execution of work is to be arranged by the “Bidder” or the “Bidder” shall arrange generator for execution of works.

15. MEASUREMENT OF WORK

The quantity of work executed shall be measured and payment made once in a month or on completion of work or on termination of the agreement, when final measurement will be made and account will be adjusted accordingly. The decision of the “Engineer-in-Charge” regarding the amount, progress, measurement and quality of the work shall be final and binding on the “Bidder”.

16. INDIAN STANDARDS, DRAWINGS AND SPECIFICATIONS

The work shall be carried with due diligence and in a workman like manner in accordance with relevant Bureau of Indian Standard specifications on the basis of latest approved drawings and technical specifications supplied by “Corporation” in absence of which as per the direction of “Engineer-in-Charge”.

The technical specifications in the relevant agreement between the “Corporation” & owner and approved drawings & technical specifications issued by the owner & “Corporation” shall be the basis for execution of work under the agreement. In the absence of approved drawings and technical specifications, the direction of the “Engineer-in-Charge” shall be final and binding on the “Bidder”.

The “Bidder” shall make arrangements to take copies of the approved drawings from the office of the “Engineer-in-Charge” for reference during execution of work.

17. PAYMENT TO WORKMEN

The “Bidder” should maintain job register and payment rolls of their workmen and get those checked by the “Engineer-in-Charge” or his authorised representative from time to time. The payment to the workers/ supervisory staff shall be made by the “Bidder” in the presence of the owner and/or “Engineer-in-Charge” or his authorised representative. The paid pay roll register shall be signed by the “Engineer-in-Charge” or his authorised representative as a token of disbursement. The copies of paid pay roll shall be submitted to the “Engineer-in-Charge” within a period of 7(Seven) days from the date of payment failing which no further payment to the “Bidder” shall be released.

18. WORKMEN COMPENSATION

In case of any loss due to accident arising during/in connection with execution of the contract, the “Bidder” will pay compensation to his workmen. The “Bidder” will be fully responsible for his workmen as per workmen’s compensation act and labour laws in force during entire period of execution of contract. In case, the “Bidder” fails to do so, the “Corporation” may pay the same and recover the same from the bills/ dues of the “Bidder”.

19. INFORMATION OF WORKMEN

The “Bidder” will make his own arrangements for procurement of labour and shall furnish all information of workmen employed by him like name, father’s name, full permanent address, sex and age to the “Engineer-in-Charge” along with the pay.

20. STATUTORY REQUIREMENTS

The “Bidder” shall comply all statutory requirements applicable at site of work such as minimum wage act, labour act, factory act, workmen’s compensation act, provident fund rules, employee’s state insurance rules etc. A certificate to this effect shall be enclosed by the “Bidder” with each Running Account Bill for payment.

21. MINIMUM AGE OF WORKMEN

The “Bidder” shall not employ any person, who is below the age of 18(Eighteen) years or unfit for the quoted items. The “Engineer-in-Charge” shall have right to decide, whether any labour employed by the “Bidder” is below the age of 18(Eighteen) years or unfit and refuse to allow any labour, whom he decides to be below the age of 18 years or unfit for any other reason.

22. LABOUR LICENCE

The “Bidder” has to obtain valid labour licence and maintain all records at his own cost as per the conditions laid down in the labour rules in vogue and amended from time to time.

23. MINIMUM WAGE ACT

The “Bidder” shall pay wages of each labour at the rate not less than the wages as per Minimum Wages Act in force and as may be amended from time to time. The “Engineer-in-Charge” has the right to enquire into and decide on any complaint of the labourers relating to non-payment or less payment of wages to them and his decision will be final and binding on the “Bidder”.

24. NON-PAYMENT OF DUES OF LABOURERS

If the “Bidder” fails to pay the dues of labourers engaged by him for this work in time, the same shall be paid by the “Engineer-in-Charge” directly to the deserving workers. The expenditure so incurred on account of non-payment or less payment shall be recovered from the bills or any other dues of the “Bidder”.

25. PROVIDENT FUND (PF)

Employees Provident Fund., wherever applicable, shall be payable by the “Bidder” as per the Provident Fund Rules in force and shall keep the “Corporation” indemnified for it. He should get the registration number for this from the Regional Provident Fund Commissioner, Odisha. He shall produce the records in support of payment of EPF/FPF dues to the “Engineer-in-Charge” for check and record by the “Engineer-in-Charge”.

26. EMPLOYEES STATE INSURANCE SCHEME (ESI)

The Employees State Insurance Scheme(ESI), wherever applicable, shall be payable by the “Bidder” as per the E.S.I. Rules in force and shall keep the “Corporation” indemnified for it. He should get the Registration Number for this from the E.S.I. Deptt., Odisha. He shall produce the records in support of payment of ESI dues to the “Engineer-in-Charge” for check and record.

27. **WORKMEN INSURANCE**

The workmen insurance shall be the responsibility of the “Bidder”. He shall produce the records in support of workmen insurance to the “Engineer-in-Charge” for check and record.

28. **HUTMENTS/TEMPORARY ACCOMMODATION**

The “Bidder” has to arrange hutments/temporary accommodation for his own labourers/ workmen at the work site at his own cost.

29. **IDLE LABOUR**

“OCCL” will not be held responsible for idle labourers of the “Bidder” for any reason, whatsoever and no claim on this account will be entertained.

30. **WORKING IN SHIFTS**

If necessary, the “Bidder” may be asked to work in two(2) or 3(three) shifts. Normally, the work shall be executed in shifts. The “Bidder” may, if required, have to engage the workmen on overtime to complete the work in scheduled time. The overtime cost shall be borne by the “Bidder”.

31. **CLAIMS AND LIABILITIES**

All claims/liabilities etc. arising out of Explosives act and labour laws shall be borne by the “Bidder” and he shall keep the “Corporation” indemnified against them and also in case of injuries or death of labourer(s) resulting from accidents during the execution of the work. In case the “Corporation” will have to pay for any such claims under Workmen’s Compensation Act, the same shall be adjusted from the pending bills/dues of the “Bidder” or shall be recovered otherwise as per law from him.

32. **SAFETY**

The “Bidder” should abide by the safety laws and rules of statutory bodies, “Corporation” and owner as per directions of “Engineer-in-Charge” and Safety Officers inspecting from time to time.

33. **WATCH AND WARD**

The “Bidder” shall arrange watch and ward and safety of the site of work, constructed structures, machinery, vehicles, equipments, tools, tackles, consumables, cement, steel materials etc. of the “Corporation” and owner at his own cost.

34. **AUTHORISED PERSON**

The “Bidder” may in writing authorise his power of attorney holder or any other person to draw materials, avail facilities, and attend measurements etc. during the course of execution of work. All liabilities created by the authorised person of the “Bidder” by way of loss of materials drawn, amenities availed, unpaid wages created etc. shall be considered as the liabilities of the “Bidder” and such liabilities shall be made good by the “Bidder” or it shall be recovered from the bill/payment due to him.

35. **SPLITTING UP WORK**

The authority reserves the right to split up the work amongst various “Bidders” and increase or decrease the quantity of work mentioned in the tender document without assigning any reason thereof and no claim whatsoever will be entertained on this account. The quantity as per agreement may also increase or decrease as per actuals.

If “Corporation” desires, different agencies can be engaged at a single site of work for which each agency is to co-operate so that other agency does not face any difficulty in engagement of his machinery, equipments, vehicles etc.

36. BREACH OF CONTRACT

The ISD including EMD, SD and additional SD are liable to be forfeited in the event of breach of contract and the agreement shall be terminated. The dues of the “Corporation” including due of labourers/workmen and other statutory payable liabilities payable by the “Corporation” as principal employer shall be cleared by the “Bidder”. The decision of the “Engineer-in-Charge” in this regard shall be final and binding on the “Bidder”. The amount remaining as outstanding against the “Bidder” after adjustment of his dues shall be payable by him to “OCCL”. If necessary, legal action may be taken for recovery of the dues of the “Corporation” including labour and statutory dues to be cleared by the “Corporation” as principal employer and “OCCL” reserves the right to recover the payable amount from the “Bidder” from works done by his under any other organization or from his properties.

37. TERMINATION OF CONTRACT

The “Engineer-in-Charge” may put an end to the agreement at his option at any time due to (a) Bad workmanship (b) Dis-proportionate progress (c) Non-compliance of labour rules or (d) Any other reason. The decision of the “Engineer-in-Charge” is final in this respect and no claim on this account will be entertained. “OCCL” also reserves the right to take ex-parte measurements, if the “Bidder” does not co-operate in taking final measurements after termination of contract.

38. RESPONSIBILITY OF BIDDER

The work shall be completed by the “Bidder” in all respect within the stipulated period of completion and the responsibility of the “Bidder” shall cease only, when the items are fully accepted by the owner after erection at project site.

39. PROGRESS OF WORK AND PENALTY

The “Bidder” will achieve the desired progress as per programme.. If the “Bidder” fails to achieve the contracted quantity every month as per programme, penalty at the following rates shall be imposed.

Sl. No.	Failure percentage(%)	Penalty percentage(%)
(i)	Less than 10(Ten)%	1(One)% of value of defaulted quantity
(ii)	Above 10(Ten)% and upto 20(Twenty)%	2(Two)% of value of defaulted quantity
(iii)	Above 20(Twenty)% and upto 30(Thirty)%	5(Five)% of value of defaulted quantity
(iv)	Above 30(Thirty)%	To be asked to demobilise with penalty equivalent to 10(Ten)% of value of defaulted quantity. The “Engineer-in-Charge” will off-load the work and get the work done through any other agency or of its own at the risk and cost of the “Bidder”. No claim will be allowed to the “Bidder” in this regard.

40. REJECTION DUE TO BAD WORKMANSHIP

The rejection due to bad workmanship shall be charged to the “Bidder” at a cost of rejected items plus 20(Twenty) %.

41. TESTING OF WELDERS AND OTHER SKILLED/SEMI-SKILLED WORKMEN

The qualification test of welders and other skilled/semi-skilled workmen may be conducted at site by the “Engineer-in-Charge” and only qualified welders and other skilled/semi-skilled workmen shall be deployed for the work. The cost of testing shall be borne by the respective “Bidder”.

42. QUALITY ASSURANCE AND QUALITY CONTROL

Quality Assurance/Quality Control Plan shall be prepared before commencement of site activities and shall be followed maintaining stage-wise up-to-date record of the work.

43. SITE VISIT

The “Bidder”, interested to participate in the tender, should visit the site of work and get himself acquainted with site conditions and quoted work before submitting the tender.

44. DEVIATION OF PROVISIONS IN AGREEMENT

The “Bidder” will not vary or deviate from the provisions in the agreement without obtaining prior permission in writing from the “Corporation”.

45. RIGHT OF THE “CORPORATION”

The “Corporation” reserves the right to cancel a particular tender call or all tender calls without assigning any reason thereof. The items can be splitted among two or more bidders at any stage. The offer of any bidder or all may be cancelled without assigning any reason thereof. The requirement shown in any tender call notice are only indicative and may vary.

46. APPROACH ROAD, HAUL ROAD ETC.

The approach road, haul road etc. if required, at site of work are to be constructed and maintained by the “Bidder” at his cost.

47. SUB-LETTING

The work under any agreement shall not be assigned or sublet to anybody by the “Bidder”. If the “Bidder” shall assign or sublet or attempt to do so, the “Engineer-in-Charge” shall terminate the agreement and shall get the work done through any other agency or of its own at the risk and cost of the “Bidder”. No claim will be allowed to the “Bidder” in this regard. “OCCL” reserves the right to have access also to units of the “Bidder” to verify, if works are actually executed by him.

48. EXECUTION OF EXTRA ITEMS AND EXTRA QUANTITIES

All extra items are to be executed by the “Bidder” at current schedule of amount. All extra quantities are to be executed at agreement amount. If required, the “Bidder” has to furnish the working analysis as per actual to arrive at the extra items amount.

49. FORCE MAJEURE:

Neither party shall be liable to the other for any loss or damage occasioned by or arising out of acts of God such as unprecedented flood, volcanic eruption, earthquake or other convulsion of nature and other acts such as but not restricted to invasion, the act of foreign countries, hostilities, or war-like operations before or after declaration of war, rebellion, military or unrobed power which prevent performance of the contract and which could not be foreseen or avoided by a prudent person.

50. JURISDICTION

For all liabilities created under the various contractual obligations/impositions under this agreement, the “Bidder” undertakes not to raise any dispute or litigations in connection there with and shall make all endeavors to resolve all disputes amicably through conciliation and in all such cases, the decision of the Managing Director, “OCCL” shall be final and binding on the “Corporation” as well as on the “Bidder” failing which all such disputes arising out of the agreement shall be subject to jurisdiction of Hon’ble High Court of Odisha at Cuttack and their subordinate courts at Bhubaneswar only. Both the parties agree by mutual consent that any dispute relating to this agreement is barred from arbitration.

SECTION-IV
SPECIAL TERMS & CONDITIONS

SPECIAL TERMS & CONDITIONS

1. The Jobworker is to supply labour for giving section and profiles. All materials necessary for such work will be supplied by the Jobworker at his own cost and responsibility and profiles are to be maintained till the work is completed.
2. The offer submitted by the Jobworker will remain valid till finalization of the award of the work. He is not entitled to withdraw his offer during the period of consideration of his offer. Withdrawal of offer prior to finalization of the tender will entail for actions as deemed fit.
3. The Jobworker shall furnish the postal address of his site office as well as his permanent registered office along with Phone numbers (both Landline & Mobile) and valid e-mail id. Any notice shall be deemed to have been served if it is delivered to his authorized agent/representative at site or sent by Registered Post or sent by e-mail to the said site office.
4. The Jobworker shall arrange to obtain drawings and specification of the work from the Senior Manager's Office. He has to carry out the work at the agreement rates including any additions/alternations in drawings/specifications as may be instructed by the Engineer-in-Charge during course of execution of the work.
5. The Jobworker will install display board at his cost mentioning information about the work at worksite after drawal of the agreement.
6. The work has to be executed strictly as per drawings and specifications. The Jobworker has to engage technical persons to assist the corporation for taking initial levels, final levels, giving layout and to supervise day-to-day work.
7. Required Engineering personnel for day-to-day supervision of works will be provided by the Jobworker. Engineering personnel of OCCL will monitor the quality and progress of work and will do check measurement for payment.
8. The quantities mentioned against each item of work are subject to variations. Such variations shall not vitiate the contract. The rates quoted shall apply for increased or decreased quantities of different items.
9. The bidder has to visit the site and quote his rate which should include cost of haul road, dewatering if required by suitable method and other ancillary works for completion of work and no extra payment shall be made.

10. **PERIOD OF COMPLETION:**

This work is to be completed in all respect within **06 (Six) calendar months** (including rainy season) from the date of issue of work order. The Jobworker, whose tender is accepted must submit a programme of work within 7(Seven) days after issue of work order for approval of the Engineer-in-Charge. The Jobworker will execute the work strictly as per the programme submitted by him, failing which action will be taken by the Senior Manager as per clauses indicated in the general terms and conditions of OCCL

11. OCCL shall provide temporary Bench Mark (T.B.M.) at convenient location. The Jobworker has to establish at his cost sufficient Nos. of temporary B.Ms. for smooth execution and measurement of work.
12. Due to non-issue of design and drawings by the client in time and any hindrances caused due to non-settlement of rehabilitation and resettlement problems if any by the client which may likely to affect the progress of work or stoppage of work, the Jobworker shall have no right to claim any compensation in whatsoever manner from OCCL. The Senior Manager (Civil) in-charge of the work may direct the Jobworker to suspend the work or any part of the work temporarily for any period as may be necessary. This temporary suspension shall not vitiate the contract and the Jobworker shall not be entitled to any claim on account of such temporary closure. However this temporary suspension period will be considered towards extension of time for completion of the work.
13. All materials required for the work shall be approved by the Engineer-in-Charge before use in the work. The Jobworker must extend necessary co-operation for sampling and testing of materials by OCCL/client. However, testing charges shall be borne by the Jobworker.
14. The Jobworker has to obey all rules and regulations for movement of transport vehicles in main roads, village roads, in factory and colony areas. He has to obtain necessary permission from the concerned authorities at his cost and risk. Necessary permission/license for borrowing earth from borrow areas whether Government or private will be borne at his own risk and cost. The rate quoted is inclusive of such expenditure.
15. The Jobworker shall allow the quality control organization to take as many samples as may be required by them during course of execution of different items of works. He shall also extend necessary co-operation to carry out any number of field tests as may be necessary. Any portion of work or material rejected by Quality Control Organization/ Department shall be treated to have been finally rejected by the Engineer-in-Charge.
16. Maintenance of the work during construction and during the **Defect Liability Period of 1 (one) year after completion of the work** is the responsibility of the Jobworker.

17. The Jobworker shall display notice both in English and Oriya indicating prevailing wages of different categories of labour in a conspicuous place. He shall also maintain wage book of each worker and shall issue wage cards in the prescribed forms to different workers.
18. Payment for the work done by the Jobworker shall be based on actual field measurement. The Jobworker or his authorized representative shall be present at the time of recording the measurement at each stage and sign the field level book and measurement book as token of acceptance.

The payment for the quantity of different items executed by the Jobworker shall in no case exceed the quantity admitted by the Department/client for the respective items and certified / paid to OCCL.

19. Statutory deductions, such as security deposit, income tax including surcharge, hire charges of machineries, cost of materials, EPF contribution, labour clearance etc. shall be deducted from the R/A bills. If the Jobworker fails to submit the receipt in support of payments towards royalty, cess, tolls and other taxes, the same shall also be deducted from the R/A bills.
20. **SAFETY PROVISIONS:**

The Jobworker shall at his own expenses arrange for the safety during construction as required including the provisions in the safety manual published by the Central Water and Power Commission, New Delhi (January'1962) edition). In case the Jobworker fails to make such arrangement, the corporation shall be entitled to cause them to be provided and to recover the cost thereof from the Jobworker. For failure to comply with the provision of the safety manual, the Jobworker shall without prejudice to any other liability pay to the Corporation a sum not exceeding **rupees five hundred per day** for each day of default.

21. **ACCIDENTS :**

It shall be the Jobworker's responsibility to protect against accidents on the works. He shall indemnify the corporation against any claims for damage or for injury to person/ machineries/ transport/ vehicle property resulting from any in the course of work and also under the provision of the workmen's compensation Act.

On the occurrences of an accident arising out of the works which results in death or which is so serious as to be likely to result in death, the Jobworker shall within twenty four hours of such accident report in writing to the Senior Manager (Civil) in charge of the work stating the fact clearly and in sufficient details the circumstances of such accidents and the subsequent action. All other accidents on the works involving injuries to persons of damage to property other than that of the Jobworker shall be promptly reported to the Senior Manager stating clearly and in sufficient details the facts and circumstances against all loss or damage resulting directly or indirectly from the Jobworker failure to conform to the provisions of the said act in regard to such accidents. In the event of an accident in respect of which compensation may become payable under the

workmen's compensation Act including all modifications thereof. The Senior Manager (Civil) in charge of the work may retain. Out of any money due and payable to the Jobworker such sum or sums of money as may be in opinion of the Senior Manager be sufficient to meet such liability. On receipt of award from the Labour Commissioner in regard to quantum of compensation, the difference in amount will be reimbursed or recovered from the Jobworker

22. **WAGES :**

Wages shall have the same meaning as defined in the payment of wages Act and include time and piece rate wages, if any.

(i) Display of notices regarding wages etc.

The Jobworker shall :

- (a) Before he commences his work, continue to display and correctly maintain in a clean and legible condition in conspicuous places on the work, notices in English and in the local India language spoken by the majority of the workers, giving the rates of wages prescribed by the State Public Department/Electricity Department for the district which the work is done.

- (b) Send a copy of such notice to be Engineer-in-Charge of the work.

(ii) Payment of wages :

- (a) Wages due to every workers shall be paid to him / her directly.
- (b) All wages shall have to be paid in current coin or currency or in both.

(iii) Fixing of wages period :

- (a) The Jobworker shall fix the wage period in respect of which the wages are payable.
- (b) No wage period shall exceed one month.
- (c) Wages of every workman employed on the contract shall be paid before the expiry of ten days, after the last day of the wage period in respect of which the wages are payable.
- (d) When the employment of any worker is terminated by or on behalf of the Jobworker, the wages earned by him shall be paid before the expiry of the day succeeding the one on which his employment is terminated.
- (e) All payments of wages shall be made on a working day.

(iv) Wage book and wage cards etc. :

- (a) The Jobworker shall maintain a wage book of each worker in such as may be convenient, but the same shall include the following particulars.
- (b) Rate of daily/monthly wages.

- (c) Nature of work on which employed.
 - (d) Total No. of days working during each wage period.
 - (e) Total amount payable for the work during each wage period.
 - (f) All deductions made from the wages with an indication in each case of ground for which the deduction(s) is/are made.
 - (g) Wage actually paid for each period.
23. During excavation of cut-off-trench and other components, shoring, shuttering including cost, carriage of materials including all taxes and cost of dewatering is to be borne by the Jobworker. Only the designed sectional quantity will be paid. Dewatering from the foundation trenches including and running charges of pump and coffer dam if required will be borne by the Jobworker.
 24. It must be definitely understood that the Corporation / Government do not accept any responsibility for the correctness and completeness of the trial borings shown in the cross sections.
 25. Excavated materials and debris unused in the area are to be removed from the site by the Jobworker at his own cost and responsibility as per the direction of Engineer-in-charge.
 26. The work will be executed as per approved drawing, design and B.I.S. specification and as per the instruction of Engineer-in-charge.
 27. No claim whatsoever on account of interest will be entertained under any circumstances.
 28. The Jobworker will remain responsible to arrange all mechanical means whenever required to complete the work in time at his own cost.
 29. Any damage caused to the work due to any cause except major natural calamity whatsoever during the execution will be made good by the Jobworker until it is handed over to the Department in complete shape.
 30. The quantities provided in the tender document are tentative which is likely to vary during execution as directed by the Engineer-in-charge.
 31. If use of explosives is necessary for the purpose of blasting of rock required at any stage of the execution, the Jobworker is to obtain necessary blasting area license from the appropriate authorities and procure the explosives and store them at his own responsibility and arrange in the work sites. The procurement and storage of the explosives is the sole responsibility of the Jobworker & he shall abide by all the laws of explosive act.
 32. No extra cost is to be paid to the Jobworker towards construction of coffer dam, diversion channel, approach road & haul road etc. required for execution of work. The approach road / haul road to work site will be maintained by the Jobworker.
 33. The detail specification enclosed with the tender papers for different item of work should be strictly adhered to during course of execution of work. The work is to be carried out strictly as per OPWD code, BIS specification and as per prevailing standards of State Govt. and Central Govt.
 34. If departmental land is available, the Jobworker will be allowed to use the same for accommodation of his labourers, stores and machineries free of rent. If department land is not available the Jobworker will make his own arrangement for land for such requirement at his own cost.

35. The quantity mentioned can be increased or reduced to the extent of 10% for individual items subject to a maximum of 5% over the estimated cost. If it exceeds the limit stated above, prior approval of competent authority is mandatory before making any payment.
36. The period of completion is fixed as **06 calendar months (including rainy season)** and cannot be altered except in case of exceptional circumstances with due approval of next higher authority / Client Department.
37. Royalty for stone products, sand, and Borrow earth are to be recovered from the Jobworker's bill as per prevailing Govt. Notification.
39. The Jobworker is required to establish a field labour with required equipments for quality control testing at site at his own cost.

40. Testing of reinforcement bar and concrete works.

- (i) If, in the opinion of the Engineer-in-Charge of the work, the reinforcement bars to be used in the work requires testing in order to confirm its technical specification, the same shall be tested either in the Department laboratory or in any other authorized laboratory as referred by the Engineer-in-Charge at the cost of the Jobworker. The Jobworker shall bear all the cost towards supply of required samples, transportation and testing charges. The decision of the Engineer-in-Charge on this aspect is final and binding on the contractor.
 - (ii) All the testing of concrete works shall be carried out as per the direction of the engineer-in-charge or his authorized field functionaries and in case of any dispute arises on this aspect, the decision of the **Engineer-in-Charge** is final and binding on the Jobworker. Testing of all the concrete works of all grade required for structures, Cement Concrete lining and in any other construction activities of the work shall be tested in the Department Laboratory at the cost of the Jobworker. The Jobworker shall supply all the required samples at his own cost including transportation and bear all the testing charges of the concrete. The cost for the testing as charged by the Govt Quality control testing unit shall be final and binding on the Jobworker. If, in the opinion of the engineer-in-charge a Field Laboratory for acceleration of testing of concrete is required, the Jobworker shall install it at the work site at his own cost with all the required machineries and equipments as per the direction of the engineer-in-charge and cement testing work shall be carried out in the Field Laboratory under the direct supervision of the Field functionaries of the Govt Quality control testing unit.
41. The Bidders are required to inspect the site and satisfy themselves regarding availability of land for the work and other facilities for execution of same. It may be noted that, he is to complete the work within the time specified. No extension of time will be allowed in any account. If the Bidder fails to complete the work within the scheduled time or leaves the work incomplete, he will have no claim on the work so executed and in this matter the decision of the Engineer-In-Charge of the Corporation is final & binding.
 42. The work has to be executed confirming to ISI standards and specifications.
 43. The rate quoted will be inclusive of all taxes, duties and cess etc. but excluding GST. The rates will be firm and binding during the entire period of execution and extension thereof.
 44. The contract price will be inclusive of all ancillary works such as approach road to work site, dewatering, desilting, cofferdams, water diversion measures, shoring, strutting, gangways, chutes, ramps, ladders, scaffolding, the quality control testing charges and any other such works, which will not be measured but are necessary for carrying out the proposed construction. No extra payments will be made to the Jobworker for such ancillary works/jobs.
 45. The price of the Jobworker will be inclusive of all finishing jobs and rectifications works as and when required. The defect liability period will be for a period of 1 year after the date of handing over. Successful completion and handing over on the part of the Jobworker will not resolve him from the responsibility of attending to all the required rectifications and maintenance of the system during the defect liability period.

46. The Jobworker will be fully responsible for the safety of the work, property and workmen. The Jobworker will provide proper insurance cover for the work and property against any damage due to accidents, natural calamities or otherwise from the date of commencement till the end of defect liability period and also insurance cover against possible accidents and personal injuries to workers and workmen during the period of construction.
47. The Jobworker has to extend all necessary co-operation in collection of soil samples and preparation of structural plan before execution of the work.

PERCENTAGE RATE TENDER AND CONTRACT FOR WORKS**GENERAL RULES & DIRECTIONS FOR THE GUIDANCE OF JOBWORKERS**

1. The work proposed for execution by contract will be notified in a form of invitation to tender posted through websites www.odishaconstruction.com

This notice will state the work to be carried out, the items and approximate quantities thereof as well as the date for submitting and opening tenders also the amount of earnest money to be deposited and the amount of the security deposit by the successful bidder and the percentage if any to be deducted from bills. Copies of the specifications, designs and drawings and any other documents required in connection with the submission of tender signed for the purpose of identification by the Sub-divisional Officer/Executive Engineer shall also be open for inspection by the Jobworker at the office of the Sub-Divisional Officer/Executive Engineer during office hours.

2. In the event of the tender being submitted by a firm it must be signed separately by each member thereof, or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power of attorney authorizing him to do so.

3. Receipts for payment made on accounts of works, when executed by a firm must also be signed by the several partners, except where the Jobworkers are described in their tender as a firm in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having authority to give effectual receipts for the firm.

4. The memorandum of work tendered for and the memorandum of materials to be supplied by the OCCL and their issue rates shall be filled in and completed in the office of the Senior Manager (Civil) before the tender form is issued if a form is issued to an intending tender without having been so filled in and completed, he shall request the office to have this done before he completes and delivers his tender.

5. The Jobworker/Bidder have to submit Bid Security Declaration be submit as per Works Department Office Memorandum No. 4710, dated. 12.04.2022 as part of its bid

6. The Engineer-in-charge or his duly authorized assistant will open the tenders in the presence of any intending Jobworkers who may be present at the time and will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of tender being rejected the earnest money shall thereupon be returned to the bidder.

7. The Engineer-in-charge shall have the right of rejecting all or any of the tenders.

8. In the event of a tender being selected for acceptance the Engineer who opened the tenders will, if he is competent to accept the tender, inform the bidder of the selected.

tender who shall there upon sign copies of the specification and other documents with the agreement. The bidder of the selected tender shall also deposit the required amount of the security money within the prescribed time. If the bidder fails to deposit the required amount of the security money within the prescribed time the Engineer-in-charge may reject the tender.

If the Engineer is not competent to accept the tender himself, he will inform the bidder of the tender which he decides to recommend for acceptance, such bidder shall thereupon sign forthwith copies of the specification and other documents mentioned in rules 1 and 4 and shall deposit the required amount of the ISD/PSD within the prescribed time. The tender with the specification and other documents signed by the bidder will then be forwarded for acceptance to the Engineer who is competent to accept the same. If the said Engineer rejects the tender the ISD/PSD deposited shall be refunded to the bidder.

9. When a tender is selected for acceptance, the bidder shall deposit the required amount of the ISD/PSD. No tender shall be finally accepted until the required amount of the ISD/PSD has been deposited.

10. The amount of Initial security Deposit to be deposited by the bidder whose tender is selected for acceptance shall be 2 (two) percent of the agreement value of the work, failing which tender shall be liable to rejection.

Taxes as per provisions of Government shall be deducted from the bills of bidder.

11. When tender has been selected for acceptance and the required amount of the security money has been deposited the Engineer shall scrutinize all pages of the form of item, Rate Tendered/quoted percentage in case of percentage tender and Contract for works to see that the form has been properly filled up and signed by the Jobworker and the signature witnessed. He shall then, if he is competent to accept the tender, sign the acceptance of the tenders or if he is not so competent to, shall send the form for signature of the acceptance to the officer competent to accept it.

12. All bidders are required to submit a list of works, which are in hand at the time of submitting their tenders. The list of works are required to be submitted in the proforma by the Executive Engineer under whom he has executed the work in order to judge their past performance (vide Works Department Circular No. 15443 dt. 01.08.2005.)

13. The earnest money deposited is liable to be forfeited to Corporation, if the bidder backs out from the offer before acceptance of the tender by the competent authority.

14. IT towards GST will be deducted at the rate prescribed in the Odisha Goods & Service Tax Act-2017 or as amended from time to time.

SECTION-V

TECHNICAL SPECIFICATION

33
SECTION – 1
GENERAL INFORMATION

1.0 **General Information & Scope of Work**

1.1 Description of work to be executed: “Improvement to Chitrotpala left embankment from RD 22.700Km to 24.200Km.”

1.2 Location of work site:

The works site is located near Patkura.

1.3 **Transport communication facilities.**

Private buses and trucks are playing through frequently from work site. The Jobworker has to make arrangement at his own cost to transport all his construction equipments, construction materials and labour to work site, as stated via above root.

1.4 **Climate:**

The project area has moderated climate with mean temperature from 26 °C to 37 °C during summer month. The rainy season is generally confined to four months from 16th June to 15th October during which about 90% of the total annual precipitation is received.

1.5 **Availability of Labour:**

Both Semi-Skilled & unskilled labour required for the work are available in project area and it is preferable to engage local labourer, However the Jobworker must make his own arrangements for labour / machineries / equipments.

1.6 **Nearest Town:**

The nearest town to the work site is Patkura(20 Km).

1.7. **Availability of Petrol, Diesel and other lubricants:**

The nearest petrol pumps for procurement of petrol, diesel and other lubricants are available at Patkura. The Jobworker shall make his own arrangement for procurement of same at his own cost required for the machineries and equipments engaged for the work.

1.8 **Electric Supply:**

Electricity supply is available at work site. The Jobworker shall make his own arrangement for extension of electric connection at his own cost if so required by him.

1.9 **Observation of Rules:**

The Jobworker shall take precaution to ensure safety to the workers. The department/Corporation will not take any responsibility for accident if any that may occur during the period of execution. The Contactor shall take immediate action to rectify the defects, immediately if any during the period of execution pointed out by the Department. Labour licence must be produce before the starting of work.

1.10 **Housing Facilities:**

Private house may or may not available in the vicinity of the work site. The Jobworker shall make his own arrangement for housing the labourers, workers and staff at the work site.

1.11 **Medical Aid:**

The nearest Health Centre available at Patkura (20Km). However, the Jobworker shall make first aid arrangement at his own cost in accordance with rule and regulations of prevailing Labour Act.

1.12 **Post, Telegraph & Telephones:**

Post, Telegraph, Telephones, & Fax are available at Patkura (20Km).

1.13 **Local Roads:**

The existing available approach road to the work site can be used by the Jobworker. The Jobworker shall however construct and maintain the connecting roads in the working areas including drainage, sanitary etc. at his own cost. The Jobworker shall construct haul road and other approach road as maybe necessary for proper execution of the work at his own cost.

1.14 **General Information:**

1.14.1 The information and the data related to work site conditions described above represents the site condition in general and for information of the bidders/Jobworkers. The department does not guarantee the reliabilities or accuracy of any other data. The Jobworker shall undertake at his expense such studies as are necessary to assess the reliabilities and accuracy of information presented.

1.14.2 It shall be presumed that the bidder / Jobworker visits sites of proposed works at his expense and satisfy himself as to the nature and location of work and local condition in general and particularly about the availability of construction materials electricity supply, water supply, storage and handling of materials, disposal of soil, road communication, availability of labour and other related matters, planning for execution etc. before quoting his rates for different items of work. The department therefore will not bear any responsibility for any interpretation or conclusion made by the Jobworker in respect of site condition and consequence thereof.

1.15 **Sources of Fund :**

“Department of Water Resources”.

2.0 GENERAL SPECIFICATION

- 2.1 The enclosed drawing in the Quotation document gives broad dimensions and outline of the works to be executed through this contract. These drawings may however be revised/modified from time to time and supplementary additional drawing may also be issued as per necessity. During the course of execution there may be changes in dimension, specifications and shape of components. These changes in the drawing can be done without in any way deviating the terms of the contract and the Job Worker is to execute the work as per revised drawings and specifications at the same rate as agreed upon for the work awarded under the original contract. The Job Worker shall do no work without proper drawings. He shall check all drawings and specifications carefully and advise the Engineer-in-charge if any error and omission are discovered where upon the Executive Engineer will prepare revised additional drawings and specifications and may be required to suit the stage of the work.
- 2.2 Where the drawings are not consistent with the text of the specifications, the text shall govern.
- 2.3 The rates shall be for finished items of works as per description in the schedule of quantities and according to drawings, specification and conditions of the contract. The rates quoted shall be for execution of finished items of work & the specifications of which confirm to the details furnished in the Agreement and provisions in Bureau of Indian Standards and shall include all general and incidental charges which will not be paid separately. Such general and incidental charges are listed in succeeding Para for the convenience of the Quotationers but are not exhaustive. Omission of any such items here in but required for delivering finished items of work, shall not be plea, that such items are not covered by the rates quoted.
- 2.4 Formation and maintenance of haul roads including river and drainage crossings within the work site. The existing approaches and haul roads, if any, under the control of the Department may be made use of but improvement, if required, shall be done by the Job Worker at his own cost.
- 2.5 Labour and material required for the construction of reference points, bench marks, pillars, diversions, signboards, road signals etc. for setting out works shall be at Job Workers cost.
- 2.6 Scaffolding and gangways as and when required for the work will be done by the Job Worker at his own cost. No additional payment in this regard, will be entertained.
- 2.7 The rate includes all leads, lifts & delifts.
- 2.8 Form work complete includes cost of materials, labour, maintenance, erection dismantling and removal.
- 2.9 Construction of coffer dam, dewatering of any water, that may accumulate in the areas required for carrying out the items under schedule of quantities, includes the initial dewatering of the pond formed after the formation of coffer dam or any type of cross bound and all seepage that may accumulate in the area before of during construction.

- 2.10 Protection of the components of work during the rainy season shall be the responsibility of the Job Worker. The responsibility for the safety of the structure rests, entirely on the Job Worker and any damages that may occur, has to be made good by the Job Worker at his own cost.
- 2.11 The sequence of construction adopted by the Job Worker shall have to be approved by the Engineer-in-Charge.
- 2.12 The Job Worker has to make his own design for coffer dam or any type of cross bund required during course of execution. All materials for the coffer dam of cross bund shall be arranged by the Job Worker at his cost. The Job Worker shall maintain the coffer dam/cross bund till completion of the work.

2.13 Quality Control :

- 2.13.1 Before collecting materials required for execution of the respective items of work as laid down in the schedule of quantities and in the detailed specifications described hereafter in the subsequent sections, the Job Worker shall ensure that samples of materials proposed to be used are first approved by the Engineer-in-Charge. When directed the samples of materials proposed to be used should be furnished to the Departmental laboratory as per direction of the Engineer-in-Charge
- 2.13.2 All such testing charges shall be borne by the Job Worker. The Job Worker will provide necessary assistance if required for collection of samples.

The Job Worker is liable to pay for any test which is not included in the agreement but required in the opinion of the Engineer-in-Charge during execution of the work for which no additional payment will be made to the Job Worker.

- 2.13.3 On the basis of satisfactory test results confirming to technical specification, collection of materials shall be started in the field. The testing of materials shall be checked in the field Laboratory by the Client as well as staff of OCCL. If the field test result is found unsatisfactory, the materials shall be rejected and action taken to remove the same from work site by the Job Worker at his own cost. In no case the defective materials shall be used in the work.
- 2.13.4 On receipt of notice from the Engineer-in-charge and on observation of Field Staff of Deptt. / OCCL, the Job Worker will rectify the defect in stipulated period at his own cost. If the defects are not rectified in the stipulated period, the Engineer-in-charge shall assess the cost, get the defect rectified and recover the same from the dues of the Job Worker.
- 2.13.5 A quarry chart indicating possible source of materials may be seen in the office of the Tahasildar, Angul. The Job Worker must however satisfy himself that materials as per required specifications and quantity are available in those quarries. No extra payment will be made due to non-availability of materials as per required specification and quantity in the quarries shown in the departmental quarry chart. The quarry chart is only an indication of source of material and the department does not accept the responsibility if the materials are not available in full quantity and quality.
- 2.13.6 No claim for carriages of water whatsoever will be entertained.
- 2.13.7 Decision regarding usefulness of excavated materials rests fully on the Engineer-in-Charge. However he may take advice of Quality Control Organisation or higher authorities if required.

SECTION-2(II)**ROAD WORK****GENERAL**

1. Road shall be constructed to the lines, level and grade with sand and moorum fill having desired parameters of density cohesion, etc. so as to ensure the designed stability and performances of the whole road. The Quality Control Organization of the project may carry out requisite test for the suitability of construction materials well in advance and the contractor shall ensure that only approved materials are brought to place of fill and used for construction of Road.
2. The difference in elevation of the approach road during construction within each working length of not less than 50M shall not exceed 1.0M anywhere in the cross section unless specifically permitted by the Engineer-in-Charge placing of the layers for the road portion programmed for construction in the season shall be continuous and approximately horizontal. In case the whole length of road is not constructed simultaneously, the incomplete end of the road shall be kept at slope not steeper than 1 in 4.
- 3 No materials shall be placed in any section of the road until the road seat for that section has been dewatered, suitably prepared and approved by the Engineer -in-Charge. All portions of excavation made for test pits or other sub-surface investigations, all holes, hollows, and all other existing cavities found within the area to be covered and which extend below the established lines of excavation for road seats, shall be filled with suitable earth fill of the corresponding zone of the road and suitably compacted.
- 4 Pools of water shall not be permitted in the foundation for road and such water shall be drained and cleared prior to placing the first layer of road materials.
- 5 The contractor shall construct and maintain good diversion in case the existing communication are disturbed. Precautionary measures such as night lamp, danger fencing signals shall be provided by the contractor at his cost to avoid accidents on the communication lines because of contacts activities.

SETTING OUT OF THE WORK

- 1 In the vicinity of the road, there are permanent Bench Marks fixed by Survey of India. Temporary Bench Marks shall be set up by the department at every 1.0 km interval at convenient locations along the road to serve as control points. The contractor shall establish sufficient numbers of reference Bench Marks for facilitating the setting out and taking levels for measurement of work with the approval of the Engineer-in-Charge at his own cost. The Bench Mark shall be 30cm X 30cm X 75cm with concrete pillar, which shall be embedded 55cm into firm ground and 20cm projecting above the ground. The Bench Marks shall be constructed in plain c.c. M-10. These pillars shall be well protected from being disturbed. The word B.M. showing value of R.L. shall be conspicuously carved and painted on the Bench Mark.
- 2 Before starting any work and during execution (if required) the contractor shall erect reference Bench Marks, reference lines and check profiles at convenient locations as per the direction of the Engineer- In-Charge. The centre line of the road and the reference line for all alignments for demarcation purpose shall be laid by properly dug-belled on the ground.

3 The Check profiles shall be located at 30M. apart or closer as directed by the Engineer-In- Charge so as to ensure execution of all slopes, steps and elevations, to the profile as indicated in the approved drawings. All important levels and all control points with respect to Bench Marks and reference lines shall be fixed and co-related by the Engineer-In-Charge.

4 To ensure correctness of execution the edges of cutting, the lines of the road and those of spoil bank shall be marked carefully with pegs at close enough intervals so as to obtain a layout in plan free from banks. The pegs shall then be connected by stretching string from peg to peg and dug belling into ground along the strings. The lines so connected shall be corrected whenever necessary to provide a stream lined plan of the features. Special care shall be taken at curves to ensure uniform curvature of the alignment. The layout of the structures shall have to be given in appropriate manner with pegs & pillars. ;

5. All materials and labour for settings out works including construction of reference Bench Marks, reference lines check profiles and surveys, as may be required at the various stages of the construction, shall be supplied by the contractor at his own cost. The cost of such works shall be deemed to have been included in the costs of items in schedule.

PREPARATION OF SITE

1 CLEARING THE SITE

- (a) The contractor shall clear the entire area required for setting out, of all tree stumps, bushes, jungles, roots, brushwood, rubbish of all kinds, loose stones and all other objectionable materials. The ownership of all the useful materials so removed from clearing site and or excavation shall rest with the department. The contractor shall have to remove all the stumps and roots of trees for which no additional payment will be made. The roots of the trees shall be grubbed to full depth. The contractor shall dispose off all such materials within 1 km. or as directed by the Engineer-in-Charge. All operations in connection with clearance of jungle and bushes shall be subject to provision of forest acts and rules.
- (b) No separate payment will be made to the contractor for the complying the requirements of this paragraph and all cost shall be deemed to have been included in the rates quoted in schedule for the items of excavation.

2 RECORDING OF CROSS SECTION

After clearing the site the area is to be stripped of objectionable materials after which the initial cross sections shall be taken at every 30 m interval or closer depending on nature of the ground upto sufficient distance outside the limit if work. Levels on these cross sections shall be taken at 5 m. or closer intervals as directed by the Engineer-in-Charge and recorded in the field and level books in the presence of the contractor or his authorised agent shall sign the field work/level book in the token of acceptance. These c.s. shall form the basis of all future measurement and payment. The original c.s. duly signed by contractor and the Engineer in charge shall be preserved. Such dimension shall be measured to the nearest 0.01 M. any dimension greater than 25 mm. shall be measured to 0.01 M. Area shall be computed to 0.01 M², volume shall be computed to 0.01 M³.

FOUNDATION PREPARATION

1 SOIL FOUNDATION

Soil foundation under the seat of road shall be scarified and loosened by means of a plough, fipper or other means to a depth of about 15 cm .to 20 cm .to the satisfaction of the Engineer-in-Charge. Roots and other debris turned up during scarifying shall be removed from entire foundation area for the fill. Before placing of fill materials, the stripped slat of the road is to be initially compacted. The first few layers of fill for the road shall be of depth of 10 cm to 15 cm and shall be carefully placed, ensuring uniform compaction and a satisfactory intimate bond between the foundation soil and fill materials. Heavy rubber type rollers or vibratory rollers may be used for compaction because they will follow the irregular surface and not bridge over small low areas as other type of rolling equipments will do. Power Road Rollers shall be used for compaction of impervious soil and preferably vibratory type roller shall be used for compaction of all other soil and rock. Separate payment shall not be made for preparation of foundation as above and it shall be deemed to have been included in the unit rate quoted for respective item of road.

2 SAND FOUNDATION

Sand met with in foundation shall be tested for its lateral relative density. In reaches where the relative density is less than 70% the foundation sand shall be compacted by any of the approved methods to obtain a minimum relative density of 70%. Until the foundation has been tested and the relative density found to exceed 70%, fill shall not be allowed to be placed. This is necessary to minimize the effect of any structural readjustment in a loose foundation.

BORROW AREA

1 GENERAL

All materials required for the construction of road shall be obtained from borrow areas duly approved by the Engineer-in-Charge in consultation with quality control unit. The contractor has to arrange borrow area for necessary testing and approval of Engineer-in-Charge to borrow sand & moorum at his own cost and responsibility. No compensation whatsoever for change in limits and locations of the borrow areas and depth of cut for getting suitable road materials shall be paid to the contractor. No excavation is permitted within a distance of ten times the height of road from the outer toe. Borrow pits shall be operated so as not to impair the usefulness or mar, the appearance of any part of the work or any other property. The surface of wasted materials shall be left in a reasonably level and even condition. Adequate lighting arrangement should be provided by the contractor at the borrow area if required.

2 PREPARATION OF BORROW AREA

All areas required for borrowing sand for road shall be cleared of all tree stumps, roots, bushes, rubbish and other objectionable materials. Particular care shall be taken to exclude all organic matter from the materials to be placed in the approach road. All cleared organic materials shall be burnt to ashes or disposed off as directed. The cleared areas shall be maintained free of vegetable growth during the progress of the work. No payment shall be admissible for preparation of the borrow areas indicated above as this is deemed to have been included in unit bid price.

3 STRIPPING OF BORROW AREAS

Borrow areas shall be stripped of top soil, and any other objectionable materials to the required depth I as directed by the Engineer-in-Charge. The work may be done manually or with suitable machine. Stripping operations shall be limited only to designated borrow areas. Materials from stripping shall be disposed of in exhausted borrow areas or in the approved adjacent areas as directed. No extra payment shall be admissible for stripping the borrow areas as this is deemed to have been included in the unit bid price.

HAUL ROADS AND APPROACH ROADS

Construction and maintenance of approach roads and haulage roads will be the responsibility of the contractor. The department will have full right of way to those roads for inspection purposes. Proper road sign as directed have to be provided for safety. For haulage of road materials, the contractor shall construct ramps and haulage and of sufficient width along the shortest but most practical route and shall maintain and illuminate them to a satisfactory manner. Watering of the haul road shall be done by the contractor as often as necessary to prevent raising of dust, formation of cuts and consequent deterioration of the surface. Whenever service roads meant for public thorough fare traverse through or run close to the borrow areas, the contractor shall direct his excavation and haulage operation in such manner as to ensure uninterrupted use of the service road and safety to the public. At the haul road and the service road crossing, the contractor shall install necessary check gates and road signs. No extra payment is admissible as this is deemed to have been included in the unit bid price for the earth work item being contingent to the main work.

WEATHER CONDITIONS

Road materials shall be placed only when the weather conditions are satisfactory to permit accurate control of the moisture content in the road materials. Before closing work on road, the top surface shall be graded and rolled with a smooth wheeled roller to facilitate run off. Prior to resuming work, the top surface shall be scarified and moistened or allowed to dry as necessary and approved by the Engineer-in-Charge for resumption. The contractor shall provide suitable protection works to protect the slope from erosion due to rainwater. No payment whatsoever shall be made for providing such protection work and rectifying of monsoon damages.

WATERING

- (i) Adequate watering to the sand fills it to be done to facilitate proper compaction. Similarly water content to moorum is to be controlled for proper compaction. No compensation will be made to the contractor due to held up of work for rain, fog and moisture content in the working process.

COMPACTION

1 GENERAL

- (a) Having decided on the filling materials to be used, standard compaction test shall be made on the materials proposed for road to indicate broadly which are the most suitable type of equipment to be used and the moisture content at which compaction should be undertaken and also to determine the effects of soil moisture content, thickness of layer and number of passes.

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- (b) Having decided on the thickness of layer and range of moisture contents, tests should be made with different type of equipment available and the required number of passes should also be determined.
- (a) In all this work, the state of compaction should be measured in terms of dry density.
- (b) Density tests if felt necessary by Engineer-in-Charge shall be made after rolling in that case. Standard proctor density test shall be carried out at regular intervals to account for variations in the borrow area materials as well as that insitu excavated materials.
- (c) The contractor shall supply all materials labour machinery and equipment at his cost for the work.
- (d) No extra payment shall be made for these operations as this shall be deemed to have been included in the price bid in schedule of Quantities for the respective item of work.

ROLLING

When each layer of materials has been prepared so as to have the proper moisture, content uniformly distributed throughout the materials it shall be compacted by passing the vibrating roller or P. R. R. The exact number of passes for each layer to obtain specified density shall be designed by the field laboratory after necessary test, the layer shall be compacted in strips over tapping not less than 0.6 m. Rolling shall commence at edges and progress towards centre longitudinally. The rollers of loaded vehicle shall travel in a direction parallel to the axis of the road. Turns shall be made carefully to ensure uniform compaction. Rollers shall always be pulled. Density tests shall be made after rolling and dry density attained shall satisfy the compaction standards specified in relevant I.S. Codes.

COMPACTION OF COHESIONLESS MATERIALS

Where compaction of cohesion less free draining materials such as sand and gravel is required, the materials shall be deposited in horizontal layers and compacted to the relative density specified. The excavation and placing operations shall be such that the materials when compacted shall be blended sufficiently to secure the highest practicable unit weight and best stability. Water shall be added to the materials as may be required to obtain the specified density by method of compaction being used.

The thickness of the horizontal layers after compaction shall not be more than 10 cm, if compaction is performed by tampers and more than 15cm, if by rollers.

DRESSING SLOPES

The slopes of road shall be neatly dressed to lines and grade as shown on the drawing as the placing of fill progress, compaction shall extend over the full width of the road and materials in slopes shall be compacted as for the rest of the road. To ensure proper compaction of the edges, the cross section of the fill during construction shall be kept suitable wider as directed by the Engineer-in-Charge and cross section shall be dressed to the designed requirement after compaction for which no extra payment shall be made as it is deemed to have been included in unit bid price for item of schedule of Quantities. Materials used to fill depression shall be of same type as used in the road and shall be thoroughly compacted and bonded to the original surface. Slopes shall be maintained until final completion and acceptance. Any material that is lost by rains, weathering or other causes shall be replaced at the cost of the contractor till completion of the works and taking over by the department.

SETTLEMENT ALLOWANCES

- (i) In the fill road, settlement allowances of 2% will be provided. Accordingly extra height shall be provided but payment for design height will be made. The base width of the road will not be increased to maintain the design slopes indicated in the drawing for the additional height as settlement allowances, but the following procedure will be adopted, settlement allowances will be calculated at various levels where the slopes is to be changed and the elevations including settlement allowances will be derived keeping the road widths of the designed levels unchanged. The edges of road at the increased elevations (including settlement) when joined with the point 1 where the slope has changed earlier below, shall give the slope to be adopted for constructions.
- (ii) If the road is raised in more than one season, provision for settlement shall be made in the last season's construction as described above.

MEASUREMENT AND PAYMENT

- (a) All works shall be measured by levels.
- (b) For payments the level books, field books, the cross section sheets and calculations sheets shall be treated as adjuncts to the measurement books.
- (c) All linear measurements shall be in meters, correct to 0.01 meters, area worked out in square meter correct to 0.01 m² and volume work-out in cubic meters correct to 0.01 m³.
- (d) The quantities between the levels taken after stripping and cross sectional levels taken after construction of consolidated road with the available useful excavation soils. It shall be clearly understood that construction of road to extra width as specified and extra height formed for settlement allowance as specified earlier will not include for payment. The measurement will be limited to within design section.
- (e) Final measurement and levels shall be taken at the cross sections of the completed compacted bank design section after the slopes dressed to ensure that work is completed as shown in the drawing plus settlement allowances. The measurements for computation of quantity shall not include the extra section provided for compaction of sand fill upto lines of finished slope and for settlement allowances.

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RATE FOR PAYMENT

The rate for Construction of road under item provides all costs for labour, materials, tools and plants, machinery, excavation, transportation and incidental operations required for carrying out and completing the item of work in accordance with the specification, drawing and as directed by the Engineer-in-Charge including (i) Site clearance (ii) Setting out works (iii) Marking out, providing and forming model section, locks spitting, strings and stakes as may be considered necessary by the Engineer-in-Charge to guide the contractor in road construction (iv) compacting the original ground including preparation of seat under road (v) Scarifying and benching etc. (vi) Clearing trees stumps and bushes, stripping of the borrow area upto required depth (vii) Maintaining borrow area free from vegetation growth, drainage arrangement and moisture control including watering (viii) Loading, conveyance from designated borrow area, unloading and spreading of suitable materials including rehandling (ix) Construction and maintenance of approach roads and haul roads (x) Cutting and trimming as specified in dressing of slopes (xi) Restricted working near sites of structures (xii) Settlement allowance (xiii) Spreading in thinner layers at required places (xiv) Compaction with suitable compactors (xv) Removal of materials like bushes, roots, sods, other perishable materials and pebbles etc. from the fill materials (xvi) Providing labour and testing charge for testing of samples (xvii) All drainage and dewatering as required (xviii) The section of all work to be maintained in good order during execution and also in rainy season (xix) All safety measures.

SCOPE OF WORK

This specification covers items for construction of Granular Sub-base by providing close graded granular sub-base Grading-III materials ,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 including cost ,carriage , Royalty and other taxes of all materials and hire charges of VRR ,other T&P materials etc. complete as per direction of Engineer-in-charge.

GENERAL

- (i) All works performed shall conform to lines, grade, cross sections, levels and dimensions shown in the drawing with necessary super elevation and extra width at curves for roads and as directed by the Engineer-in-Charge.
- (ii) Proper care shall be taken to avoid any interference with or damage to works of other discipline such as water supply, sewerage, electricity etc.
- (iii) The Contractor shall submit sequence of operation which he proposes to follow to the Engineer-in-Charge and shall obtain approval to it prior to commencing work and shall adhere to the agreed sequence after modification if any by the Engineer-in-Charge.
- (iv) The methods and plants and equipments to be used by Contractor is subject to approval of Engineer-in-Charge.
- (v) Sign boards for construction activities, overtaking signals, diversion of road etc. is to be displayed by Contractor at his own cost.

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- (vi) The Contractor shall at all time carry out work in a manner creating least interference to the traffic during execution. The Contractor shall provide and maintain during execution a passage for traffic either along or as part of existingway under construction or a separate diversion road at his own cost.
- (vii) Quality of all materials should be approved by Engineer-in-Charge prior to collection at site.
- (viii) Construction traffic shall not be allowed to use the newly prepared surface without prior permission from Engineer-in-Charge. Any damage arising out of such use shall however be made good by the Contractor at his own cost.
- (ix) All measurement and computations unless otherwise indicated shall be carried out to the following limit
 - (i) Length and breadth –10 mm .
 - (ii) Height, depth or thickness of earthwork, Sub base and base course-5mm.
 - (iii) Areas - 0.01 sqm.
 - (iv) Cubic content - 0.01 cum.
- (x) Materials found inferior and rejected shall be removed from site immediately by the Contractor at his own cost.
- (xi) Works rejected by the Engineer-in-Charge on ground of poor quality or workmanship shall be dismantled and redone by the Contractor at his own cost.
- (xii) Complete stacking of materials like sand, moorum, H.G. chips: as per requirement shall be carried out in 2Km. length before spreading, The collection shall always commence at one end and be carried continuously towards the other unless the Engineer-in-Charge directs otherwise.
- (xiii) Till utilization, the Contractor will be responsible to protect the materials collected at the work site at his own cost.
- (xiv) The unit rates for different items of work shall be for payment in full for completing the work to the requirement of specification including full compensation for all the operations detailed in relevant section of specification and in schedule. The rates are considered for finished work covering all labour, tools, equipment, wastage, Temporary works, hire and running maintenance of plant and equipments, watch and ward, overhead charges and profit as well as general liabilities, obligations and risk arising out of the contract for the work.

EXCAVATION (OR) TRIMMING FOR LAYING SUB-GRADE

- (i) The road or surface to the full width of the pavement is to be excavated or trimmed to designed level for laying the sub-grade.

- (ii) The excavated material to be disposed off by laying on the berms or slope of road finished smooth or as directed by Engineer-in-Charge.
- (iii) Measurement for payment shall be made on cubic meter basis. The volume will be measured by level section limited to designed sections, lines and grade.

MATERIALS

1 MOORUM

The moorum shall have plasticity index not less than 6 as determined in accordance with I.S. 2720 (part v) .It shall be free from all rubbish, dust and organic materials as well as clods of clay / black cotton soil. The moorum should be granular and gritty.

2 SAND

Sand shall consist of hard, dense, durable and uncoated silicious gritty materials. Sand to be used shall be natural as obtained from river bed from specified quarries. It shall be free from all rubbish, dust and organic materials as well as clods of earth loam and other deleterious substances.

3 STONE AGGREGATE

METAL

- (a) The hard granite crusher broken stone metal shall be obtained from rock excavation if available or quarries as approved by the Engineer-in-Charge prior to collection. The metal shall be obtained from hard, tough, sound, durable stone of close texture as is locally available and reasonably free from decay and weathering. Pieces of the stone shall be angular and roughly cubical in shape, round, elongated or flaky materials shall be rejected. No round or along pebbles or angular chips, longer or smaller than the specified size shall be allowed. The size of the metal shall be 40mm to 90mm for I.R.C. Grade-I and 45mm to 63mm, for I.R.C. Grade-II and it shall be machine crushed.
- (b) Samples metals, collected from the approved quarries shall be get tested by the Contractor at his cost in the laboratory. The test results shall conform to the standard requirement laid down for metal to be used for this work.
- (c) The physical requirement for standard size metal shall conform to the test results in the Table in next page.

Type of construction	Test	IS for test method	Requirement
Base	(i) Los Angeles abrasion value	IS: 2386 (Part iv)	50% Maximum
	(ii) Aggregate impact value	IS: 2386 (Part iv) or IS: 5640	40% Maximum
	(iii) Flakiness	IS: 2386 (Part-I)	15% Maximum.
	(iv) Water absorption	IS: 2386 (Part iii)	2% Maximum.

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(d) Grading requirement of coarse aggregates :

The coarse aggregate shall conform to one of the gradings as given in table below provided, however the use of grading No. I shall be restricted to sub-base coarse only.

Table: Grading requirement of coarse aggregates.

Grading No.	Size Range.	Sieve Designation	Percentage by weight passing
I.R.C.-I, Metal	90 mm to 45 mm	125 mm	100
		90 mm	90-100
		63 mm	25-60
		40 mm	0-5
I.R.C.-II, Metal	63 mm to 45 mm	90 mm	100
		63 mm	90-100
		40 mm	25-60
		20 mm	0-10

CHIPS

- (a) Stone chips shall consist of regular fragments of clean hard, tough and durable rock of uniform quality throughout by crushing granite rock, and shall be free of elongated and flaky pieces, soft and disintegrated materials, and vegetable or deleterious matter. They shall satisfy the physical requirements set-forth as under.

Test	IS for Test Method	Requirements.
(i) Los Angels Abrasion value	IS:2386 (Part-IV)	35% Maximum
(ii) Aggregate impact value	-do-	30% Maximum
(iii) Flakiness index	IS:2385 (Part-I)	30% Maximum
(iv) Stripping value	IS:624	25% Maximum
(v) Water Absorption	IS:3386 (Part-III)	2% Maximum.

- (b) Size of the stone chips shall be as under :

- (i) For premix carpet 13.2mm to 5.6mm size: Passing through proper sieve and retained on 10 mm sieve.
- (ii) For precoated seal coat 6mm and down graded size: passing 10mm sieve and retained on 2.36mm. sieve.

- (c) Samples of stone chips collected from the approved quarries shall be got tested by the Contractor at his cost in laboratory. The test results shall confirm to the standard requirement as laid down herein.

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(i) Control on quality of material will be exercised by the Engineer-in-Charge by carrying out the following tests at frequencies shown against each.

Type of construction material	Test	Frequency
Chips for carpet seal coat.	i) Aggregate impact value	One test per 100 M ³ of aggregate and
	ii) Flakiness index of aggregate.	-do-
	iii) Stripping value and water absorption of aggregates.	Initially, one set of 3 representative specimens for each source of supply subsequently when warranted by changes in the quality of aggregates.
	iv) Grading of aggregates	One test for 100 m ³ of aggregates.

BITUMEN

Bitumen of 80/100 grade conforming to IS:73,217 or 454 as applicable or other approved cut back approved by the Engineer-in-Charge, in writing shall be utilized in the work. Procurement of the bitumen will be made by the Contractor at his own cost from reputed manufacturers on approval by the Engineer-in-Charge. The contractor is to produce test certificate to be issued by manufacturer for each consignment separately.

CONSTRUCTION PROCEDURE

1 SUB-BASE BELOW PAVEMENT

- (i) Moorum and sand stacked separately shall be conveyed and mixed properly to make an admixture of moorum and sand in proportion as per direction of Engineer-in-charge.
- (ii) The formation after excavation or trimming shall be dressed to required camber and grade.
- (iii) The admixture of moorum shall be spread in subbase and also side shoulders in layers not exceeding 15cm. in thickness and should be adequately watered.
- (iv) Immediately following spreading of admixture moorum rolling will be started with three wheeled roller of 8 to 10 tones capacity or equivalent vibratory roller. The rolling shall begin from edges firmly compacted and then progress gradually from edges to centre, parallel to the centre line of the road and over lapping uniformly each preceding rear wheel track by one half width and shall continue until the entire area of the course has been rolled by the rear wheel. In case of superlevated portions rolling shall proceed from inner edge to the outer edge. Rolling to continue till the admixture of moorum is thoroughly keyed. During rolling sprinkling of water is to be done as required for a dense compacted mix layer .

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- (v) The rolled surface to be checked transversely and longitudinally and any irregularities, ruts and soft yielding places be corrected by loosening surface, adding or removing amount of admixture moorum and rolling entire surface to conform desired grade and camber of 1 in 50 (not flatter than 1 in 72).

2 I.R.C. GRADE-I AND I.R.C. GRADE-II METALING

SPREADING OF COARSE AGGREGATE

- i) The quality and grading of I.R.C. Grade-I metal (size 90mm to 45mm) and I.R.C. Grade-II metal (size 45mm to 63mm .) shall satisfy criteria described under sub-head criteria "materials" (Chapter 11.6.3).
- ii) Stacking for Gr.-II shall be done after the spreading of Gr.-I metal.
- iii) The surface to receive I.R.C. Gr-I or Gr.-II water bound macadam course (metaling) shall be made free from dust and other extraneous material.
- iv) The respective grade metals shall be spread uniformly to specified nominal thickness of 11.5cm. and 10 cm for I.R.C. Grade-I and I.R.C Grade-II metaling respectively or as directed by Engineer- in-charge.
- v) The spreading shall be done from stacks along the side of the roadways or approved stock yards. In no case shall aggregates be dumped in heaps directly on the surface prepared for the metaling nor shall hauling over un compacted or partially completed base be permitted. No segregation of large or fine particles shall be allowed.
The surface of the aggregates shall be carefully checked with Templates and all high or low spots remedied by removing or adding aggregates as may be required by hand packing the same to proper grade and camber.
- (vi) The bunds of earth or moorum one on either side shall be made along the outer edge of metaling prior to or simultaneously with spreading of metal. In addition where over required turf edging are to be provided. These bunds and turf edging are required to prevent loose metal from spreading out beyond width of road to be metaled.
No extra payment will be made for the bunding or turf edging as the same are deemed to be / included in the unit rate of respective items.
- (vii) The course aggregate shall normally be spread more than 3 days in advance of the subsequent / operation.
- (viii) Spreading of metal shall proceed only 200m. in advance of rolling operation.

CONSOLIDATION

- (a) Immediately following the spreading of the coarse aggregates, rolling shall be started with three wheeled power roller of 8 to 10 tonne capacity or equivalent vibratory roller. The weight of the roller shall depend upon the type of the aggregate and shall be as indicated by Engineer-in-charge.

- (b) Except on superlevated portions where the rolling shall proceed from inner edgeto outer rolling shall begin from the edges gradually progressing towards the centre. First the edge/edges shall be compacted with roller moving forward and backward. The roller shall then move inwards parallel to the centre line of the road, in successive passes uniformly lapping preceding tracks by at least one half wheel width.
- (c) Rolling shall continue until the aggregate is thoroughly keyed and the creeping of the aggregate ahead of the roller is no longer visible. During, rolling slight sprinkling of water may be done, if necessary. Rolling shall not be done when the sub-grade is soft or yielding or when it causes a wave like motion in the sub-grade or sub-base course.
- (d) The rolled surface shall be checked transversely and longitudinally with Templates and any irregularities corrected by loosening the surface, addition or removing necessary amounts of aggregates and re rolling till the entire surface conforms to desired camber and grade. In no case shall use of screenings be permitted to make up depression.
- (e) Moorum as blinding material shall be applied, successively in two or more thin layers at a slow and uniform rate. After each application, the surface shall be copiously sprinkled with water, the resulting slurry swept in with hand brooms or mechanical brooms to fill the voids properly, and rolled, during which water shall be applied to the wheels of the rollers, if necessary to wash down the blinding materials sticking to them. These operations shall continue until the resulting slurry after filling the voids, forms a wave ahead of the wheels of the moving roller.
- (f) After final compaction of water bound macadam course, the road shall be allowed to dry overnight. Next morning hungry spots shall be filled with screenings or binding materials as directed, lightly sprinkled with water, if necessary & rolled .No traffic shall be allowed on the road until the macadam has set. The Engineer-in-charge shall have the discretion to stop hauling traffic from using the completed water bound macadam course if in his opinion it would cause damage to the surface.
- (g) Material which crushed excessively during compaction or becomes segregated shall be removed & replaced with suitable aggregate.
- (h) It shall be ensured that shoulders are built up simultaneously along with water bound macadam courses.

CONSUMPTION OF MATERIALS

Consumption of material for specified thickness of pavement in case of both I.R.C. Gr.I and I.R.C. Gr. III metaling shall be as follows:

	<u>I.R.C. Gr.I</u>	<u>I.R.C. Gr.II</u>
Over all (Nominal) thickness of layer laid	121 mm.	100 mm.
Compacted thickness	100 mm	75mm.
Consumption of metal	0.121 cum/sqm	0.100 cum/sqm
Consumption of moorum as blinding	0.030 cum/sqm	0.022cum/sqm material.

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Note : Quantity of metal and moorum is after deduction of void from stacked measurement.

PREMIX CARPET AND SEAL COAT

- (a) This work shall consist of laying an open graded carpet of 25mm thickness in a single course and 6mm thick precoated seal coat composed of suitable small sized aggregate premixed with bituminous binder on a previously prepared approved base.
- (b) The quality and grading of materials shall satisfy provisions under sub-head materials.
- (c) Carpet shall not be laid during rainy weather or when the base course is damp or wet or when the atmospheric temperature under shade is 16°C or below.
- (d) The underlying base on which the bituminous carpet is to be laid shall be scraped with wire brushes, swept clean with brooms and finally dust removed with sacks as found necessary.
- (e) Tack Coat

This work shall consist of application of a single coat of low viscosity bituminous material to under lying road surface duly cleaned preparatory to bituminous construction. The temperature of bitumen at the time of application shall be in the range of 160° to 175°C. Bitumen shall be heated to the temperature appropriate to the grade of bitumen used and approved by the Engineer-in-Charge. The rate of spread in terms of straight run bitumen shall be 0.98kg. (Say 1kg) per square meter area for untreated water bound macadam surface. The binder shall be applied uniformly with the aid of sprayers. The tack coat shall be applied just ahead of bituminous construction.

- (f) Mixing

Bitumen Mixers of approved type shall be used for mixing aggregates with the bituminous binder. The binder shall be heated to the temperature raising from 150°C to 175°C as approved by the Engineer-in-Charge, avoiding local over heating and ensuring a continuous supply. Aggregates shall be dry before they are placed in the mixer. After about 15 seconds of dry mixing the heated binder shall be distributed over the aggregates at the rate specified. Kerosene to an extent of 4% to 6% of asphalt shall be provided by the Contractor according to the requirement at his cost. Mixing of binder with chips shall be continued until all chips are uniformly coated with the bitumen and a homogeneous mixture is obtained. The mix shall be immediately transported from the mixer to the point of use in suitable vehicles. The vehicles employed for transport shall be clean and be covered over in transit, if so directed by the Engineer-in-charge.

- (e) Spreading

The mix shall be spread on the road surface with rakes to the required thickness and camber, or distributed even with the help of a drag spreader, without any undue loss of time. The camber shall be checked by means of camber boards and inequalities evened out to prepare the surface to specified line, grade and camber.

(f) Rolling

As soon as sufficient length of bituminous material has been laid, rolling shall commence. When the roller has passed over the whole area once, any high spots or depressions that become apparent shall be corrected by removing or adding premixed materials. The rolling will be done with a set of 8 to 10 tonne three wheel tandem rollers or equivalent suitable pneumatic roller as approved by Engineer-in-Charge. The roller speed will not be exceeding 5km. per hour. The roller wheels shall be kept damp to prevent the mix from adhering to them but in no case shall lubricating oil be used for this purpose. Rolling shall commence longitudinally from the edges and progress towards the centre except that in super-levated portion, it shall progress from lower to upper edge parallel to the centre line of the pavement. The roller should proceed on the fresh material with rear or fixed wheel leading so as to minimize the pushing of the mix and each pass of the roller uniformly over laps not less than one third of the track made in the proceeding pass. Rolling shall continue until the entire surface has been rolled and all the roller marks eliminated. The contractor shall provide necessary labour for keeping the roller wheels damp during rolling so as to prevent the premix from adhering to the wheels and being picked up. The edges along and transverse of the carpet laid and compacted earlier shall be cut to their full depth so as to expose fresh surface which shall be painted with a thin surface coat of appropriate bitumen before the new mix is placed against.

(g) Seal Coat

6mm thick precoated seal coat shall be applied immediately after laying of the bituminous course of carpet. Before application the surface shall be cleaned free of any dust or other extraneous matter. Mixing of chips and bitumen, laying the mix to proper thickness and rolling will be done similar to procedure for premix carpet described above.

Blinding of rolled asphalt surface with course clean sand at the rate of 0.003 cum per Sqm shall be done by the contractor at his own cost as the same is included in the unit price.

(h) Traffic

Traffic may be allowed only after final rolling when the premix material has cooled down to surrounding temperature.

(i) Consumption of Material

Material			Consumption/Sqm of Surface
A.	20mm thick premix carpet		
	1) 20mm to 12mm size H.G. chips		
	Nominal 20mm	0.015 Cum	
	-do- 10mm	0.008 Cum	
	Total	0.023 Cum	0.023 Cum
	2) Bitumen – 80/100 grade		
	Tack coat -	0.907 Kg.	
	Precoating chips	1.270 Kg.	

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	Misc. and Wastage	0.091 Kg.	
	Total	2.268 Kg.	2.268 Kg
B.	6mm thick precoated seal coat.		
	1) 6mm and down graded H.G. chips		0.006 Cum
	2) Bitumen – 80/100 grade		
	Precoating chips	0.680 Kg.	
	Misc. and Wastage	0.010 Kg.	
	Total	0.690 Kg.	0.690 Kg.
	3) Sand (for blinding)		0.003 Cum

BUILT-UP SPRAY GROUT

(a). Scope

This work shall consist of a two-layer composite construction compacted crushed coarse aggregates with application of bituminous binder after each layer, and with key aggregates placed on top of the second layer, in accordance with the requirements of these Specifications, to serve as a base course and in conformity with the lines, grades and cross-sections shown on the drawings or as directed by the Engineer. The thickness of the course shall be 75mm.

Built-up spray grout shall be used in a single course in a pavement structure.

Base and Surface Courses (Bituminous)(b),

Materials

(i) Bitumen: Clause 504.2.1, shall apply, Where permitted by the Engineer, an appropriate grade of emulsion complying with IS 8887 may be used.

(ii) Aggregates: The coarse aggregate shall conform to Clause 504.2.2.

The aggregate shall satisfy the physical requirements set out in Table 500-3. The coarse and key aggregates for built-up spray grout shall conform to the grading given in Table 500-7.

TABLE-500-7, GRADING REQUIREMENTS FOR COARSE AND KEY AGGREGATES FOR BUILT-UP SPRAY GROUT.

Is Sieve Designation (mm)	Cumulative per cent by weight of total aggregate passing	
	Coarse Aggregate	Key Aggregate
53.0	100	-
26.5	40-75	-
22.4	--	100
13.2	0-20	40-75

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	53	
5.6	--	0-20
2.8	0-5	0-5

(c) Construction Operations

Weather and seasonal limitations: The provisions of Clause 501.5.1 shall apply.

Equipment: The provisions of Clause 505.3.2 shall apply.

Preparation of base: The base on which the built-up spray grout coarse is to be laid shall be prepared, shaped and compacted to the specified lines, grades and cross- sections in accordance with Clauses 501 and 902 as appropriate. A prime coat shall be applied in accordance with Clause 502 with approved primer as directed by the Engineer.

Tack coat: A tack coat shall be applied in accordance with the procedure described in Clause 503. as directed by the Engineer.

Spreading and rolling coarse aggregates for the first layer: Immediately after the application of prime or tack coat, the clean, dry and dust free coarse aggregates shall be spread uniformly and evenly by mechanical means, at the rate of 0.5 cum per 10 Sq.m. area.

Base and surface courses (Bituminous)

Section 500

Immediately after spreading of the aggregates, the entire surface shall be milled with an 8-10 tonnes smooth wheel steel roller. Rolling shall commence at the edges and progress towards the centre except in super elevated and uni-directional cambered portions where it shall proceed from the lower edge to the higher edge, Each pass of the roller shall uniformly overlap not less than one-third of the track made in the preceding pass.

The surface of the layer shall be carefully checked, after rolling, with a template and straight edge and shall be within the tolerances specified and any deficiencies corrected by reworking and recompacting the layer.

Care shall be taken not to over-compact the layer.

Application of binder – first spray: The binder shall be heated to the temperature appropriate to the grade of bitumen approved by the Engineer and sprayed on the aggregate at the rate of IS Kg/10 Sq.m. (measured in terms of residual bitumen content) at a uniform rate of spray by mechanical sprayers capable of spraying bitumen uniformly at the specified rates and temperatures. Excessive deposits of binder caused by stopping or starting of the sprayers or through leakage or for any other reason shall be removed and made good.

Spreading and rolling of coarse aggregate for the second layers: Immediately after the first application of the binder, the second layer or coarse aggregates shall be spread and rolled in accordance with the procedure detailed in Clause 506.3.5

Application of binder – second spray: The second aggregate layer shall then be sprayed with binder at the rate of 15 Kg/10 Sq.m. (measured in terms of residual bitumen content) in accordance with Clause 506.3.6.

Application of key aggregate: Immediately after the second application of binder, key aggregates shall be spread uniformly and evenly, preferably by mechanical means, at the rate of 0.13 cu.m./10 Sq.m. so as to cover the surface completely. The key aggregate shall be clean, dry and free from dust and deleterious matter. If necessary, the surface shall be swept to ensure uniform application of the key aggregates. The entire surface shall then be rolled with an 8-10 tonnes smooth wheel steel roller in accordance with Clause 506.3.5. While rolling is in progress, additional key aggregates, where required, shall be spread by hand. Rolling shall continue-until the entire course is thoroughly compacted and the key aggregates are firmly in position.

Surface Finish and Quality Control.

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The surface finish of construction shall conform to the requirements of Clause 902. All materials shall comply with the requirements of the relevant provisions in Section 900 of the Specifications.

Base and surface courses (Bituminous)

Section 500

Final Surfacing.

The built-up-spray-grout shall be provided with final surfacing within a maximum of forty-eight hours. If there is to be any delay, the course shall be covered by a seal coat to the requirement of Clause 513 before it is open to traffic. Where the seal coat is required as a result of the selected method of performing this operation, then it shall be considered incidental to the work and shall not be paid for separately.

Arrangements for Traffic.

During the period of construction, arrangements for traffic shall be made in accordance with the provisions of Clause 112 of the Ministry's Specification for Road and Bridge works (third revision) 1995.

Measurement for payment.

Built-up spray grout shall be measured as finished work in square metres.

Rate

The contract unit rate for built-up spray grout shall be payment in full for carrying out the required operations as specified. The rate shall include for but not necessarily be limited to the components listed in Clause 50 L8.8.2(i) to (xi).

3. SHOULDER CONSTRUCTION

- (i) The shoulders or berms on either side of the pavement over the embankment to be constructed with rolled moorum layer in conformity with the lines, grades and cross sections as per approved drawing and as directed by the Engineer-in-charge.
- (ii) Moorum shall be conveyed from the road side heaps or from stockyard and spread on the prepared base to lines and grade.
- (iii) Rolling will be done with 8 to 10 tonne capacity three wheeled rollers as per similar to procedure laid for subbase.

ROAD DIVERSION

- (a) The Contractor shall Construct and maintain the road diversion for the traffic with necessary sign boards working signal during construction period as approved by the Engineer-in-charge at his own cost.
- (b) The Contractor shall take all necessary measures for the safety of traffic during construction and provide, direct and maintain such barricades including sign, marking, light and flagmen as may be required by the Engineer-in-charge for the information and protection of traffic approaching and passing through the section of the road or highway under construction. Before taking up any construction, phased programme for the Control of traffic on the road or highway shall be drawn up in consultation with the Engineer-in-charge.

- (c) The barricades erected on either side of the portion of the carriage way closed to traffic shall be strong to resist violation and painted with alternate black and white strips. Red lantern or warning lights of similar type shall be mounted on the barricades at night and kept there through out from sunset to sunrise. At the points where traffic is to deviate from its normal path, the channel for traffic shall be clearly marked with the aid of pavement marking and painted drums are to be kept through out the channel. At night the passage shall be lighted with lanterns or other suitable light sources.
- (d) One way traffic operation shall be established whenever the traffic is to be passed of the carriage way inadequate for two lane traffic. This shall be done with the help of flagmen kept positioned on opposite sides during all hours. For regulation of traffic, the flagmen shall be equipped with red and green flags and lanterns lights on both sides, suitable regulatory/warning signs shall be installed for the guidance for the road users on each approach at least two sign shall be put up one close to the point where transition of carriage way begins and the other 120 meters away. The sign shall be of approved design and of reflector type, if so directed.

MEASUREMENT AND PAYMENT

- (i) Providing and stacking moorum, H.G. metal (I.R.C. Gr.I and Ill), Moorum, metal and Chips shall be stacked in standard box heaps of 1.5 M.x1 .5M.x0.5M.to be measured as 1 Cum.Sand shall be stacked in regular stacks or box heaps of 1.5Mx 1.5Mx 0.5M as per direction of engineer-in-charge.

The unit rate for respective items includes excavating, collecting procurement, conveying to work site including loading, unloading, stacking the same at approved stack yard beyond trafficable berm in regular box heaps or stacks as directed by the Engineer-in-charge with all leads, lifts and delifts, including royalty, all taxes and incidental charges like watch and ward till utilization.

- (ii) Subbase preparation with moorum

Measurement for conveying from stacks, laying moorum and watering and rolling for subbase below pavement shall be based on cubic meter content of moorum based on premeasurement of items as actually utilized in the work after deduction of void.

The rate shall include Labour and T & P required for conveying moorum from stacks measured previously collection paid separately) spreading the moorum to required thickness, watering, rolling, turf edging with all leads, lifts and delifts, hire and running charges of P.R.R., cost, conveyance of turf and water including royalty and all other taxes, incidental charges etc .complete for finished item of work to lines and grade as per drawing, specification and as directed by the Engineer-in-charge.

- (iii) R .C Grade-I and Gr. II metaling courses will be based on cubic meter content of metals utilized in work after deduction of void from stacked measurement. Volume of moorum used as binding material will not be added to the cubic meter content of I.R.C.Gr.I or Gr.II metaling for payment. The rates shall be for finished items of work to lines and grade (excluding cost of H.G. stone, metal and moorum measured and paid separately) including labour and T & P. required for conveying from stacks and spreading hard granite crusher broken metal to specific thickness, packing voids with small size metals uniformly, hand packing to proper camber, conveying from stacks and spreading of moorum of specified grade and quantity over the metal surface to fill of interstices, watering and consolidation with P.R.R. including hire and running charges of P.R.R. and other equipments, turf edging, cost and conveyance of turf and water with all leads, lifts and delifts including royalty and all other taxes, incidental charges etc. Complete as per specification and as directed by the Engineer-in-charge.

(iv) Premix carpet and seal coat

The stacking of chips of size 12mm to 6mm and 6mm down for premix carpet and seal coat respectively should be stacked in the box for pre-measurement before use. Open graded premix carpet and precoated seal coats shall be measured as work finished to required thickness, line and grade in square meters. The sand for blinding should be stacked in standard stacks and used in work.

The unit rate for the items shall include cost of all materials of required quantity, conveyance to site of work with all leads, lifts and delifts, conveying from stacks, mixing with required quantity bitumen duly heated, application of tack coat, spreading mix to specific thickness, hand packing to proper camber, consolidation with P.R.R. including Labour charges, hire and running charges of P.R.R., bitumen mixture, tar boiler and all other equipment complete as per approved specification and as directed by the Engineer-in-Charge.

In case of seal coat the rate also includes blinding the surface with coarse clean sand as per specification

(iv) Shoulder construction

Measurement for conveying moorum from stacks and spreading to required thickness, watering and rolling shall be based on cubic meter content of moorum, after deduction of void, actually utilized in the work.

The rate shall be for finished items of work including labour charges with all leads, lifts, delifts, hire and running charges of P.R.R. and other equipments, turf edging, cost and conveyance of turf and water but excluding cost of moorum measured and paid separately.

57
WATER BOUND MACADAM SUB-BASE/BASE

Scope

This work shall consist of clean, crushed aggregates mechanically interlocked by rolling and bonding together with screening, binding material where necessary and water laid on a properly prepared subgrade/ sub-base/ base or existing pavement, as the case may be and finished in accordance with the requirements of these Specifications and in close conformity with the lines, grades, cross-sections and thickness as per approved plans or as directed by the Engineer.

It is, however, not desirable to lay water bound macadam on an existing thin black topped surface without providing adequate drainage facility for water that would get accumulated at the interface of existing bituminous surface and water bound macadam.

Materials

Coarse aggregates : Coarse aggregates shall be either crushed or broken stone, crushed slag, overburnt (Jhama) brick aggregates or any other naturally occurring aggregates such as kankar and laterite of suitable quality. Materials other than crushed or broken stone and crushed slag shall be used in sub-base courses only. If crushed gravel/ shingle is used, not less than 90 per cent by weight of the gravel/ shingle pieces retained on 4.75 mm sieve shall have at least two fractured faces. The aggregates shall conform to the physical requirements set forth in Table 400-6. The type and size range of the aggregate shall be specified in the Contract or shall be as specified by the Engineer. If the water absorption value of the coarse aggregate is greater than 2 per cent, the soundness test shall be carried out on the material delivered to site as per IS : 2386 (Part 5).

Crushed or broken stone: The crushed or broken stone shall be hard, durable and free from excess flat, elongated, soft and disintegrated particles, dirt and other deleterious material.

TABLE 400-6. PHYSICAL REQUIREMENTS OF COARSE AGGREGATES FOR WATERBOUND MACADAM FOR SUB-BASE/BASE COURSES

Test	Test Method	Requirements
1 * Los Angeles Abrasion value	IS:2386 (Part-4)	40 per cent (Max)
Or * Aggregate Impact value	IS:2386 (Part-4) or IS:5640**	30 per cent (Max)
2 Combined Flakiness and Elongation	IS:2386	30 per cent (Max)

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indices (Total)	(Part-1)	

* Aggregate may satisfy requirements of either of the two tests.

** Aggregates like brick metal, kankar, laterite etc. which get softened in presence of water shall be tested for Impact value under wet conditions in accordance with IS: 5640.

*** The requirement of flakiness index and elongation index shall be enforced only in the case of crushed broken stone and crushed slag.

Crushed slag : Crushed slag shall be made from air-cooled blast furnace slag. It shall be of angular shape, reasonably uniform in quality and density and generally free from thin, elongated and soft pieces, dirt or other deleterious materials. The weight of crushed slag shall not be less than 11.2 kN per m³ and the percentage of glossy material shall not be more than

20. It should also comply with the following requirements:

(i) Chemical stability : To comply with requirement of

appendix of BS : 1047

(ii) Sulphur content : Maximum 2 per cent

(iii) Water absorption : Maximum 10 per cent

Overburnt (Jhama) brick aggregates : Jhama brick aggregates shall be made from overburnt bricks or brick bats and be free from dust and other objectionable and deleterious materials.

Grading requirement of coarse aggregates : The coarse aggregates shall conform to one of the Gradings given in Table 400-7 as specified, provided, however, the use of Grading No.1 shall be restricted to sub-base courses only.

TABLE 400-7. GRADING REQUIREMENTS OF COARSE AGGREGATES

Grading No.	Size Range	IS Designation	Sieve	Per cent by weight passing
1.	90 mm to 45 mm	125 mm		100
		90 mm		90-100
		63 mm		25-60
		45 mm		0-15
		22.4 mm		0-5
2.	63 mm to 45 mm	90 mm		100
		63 mm		90-100
		53 mm		25-75
		45 mm		0-15

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3.	53 mm to 22.4 mm	22.4 mm	0-5
		63 mm	100
		53 mm	95-100
		45 mm	65-90
		22.4 mm	0-10
		11.2 mm	0-5

Note : The compacted thickness for a layer with Grading 1 shall be 100 mm

while for layer with other Gradings i.e. 2 & 3, it shall be 75 mm.

Screenings: Screenings to fill voids in the coarse aggregate shall generally consist of the same material as the coarse aggregate. However, where permitted, predominantly non-plastic material such as moorum or gravel (other than rounded river borne material) may be used for this purpose provided liquid limit and plasticity index of such material are below 20 and 6 respectively and fraction passing 75 micron sieve does not exceed 10 per cent. Screenings shall conform to the grading set forth in Table 400-8. The consolidated details of quantity of screenings required for various grades of stone aggregates are given in Table 400-

9. The table also gives the quantities of materials (loose) required for 10 m² for sub-base/base compacted thickness of 100/75 mm.

The use of screenings shall be omitted in the case of soft aggregates such as brick metal, kankar, laterites, etc. as they are likely to get crushed to a certain extent under rollers.

TABLE 400-8. GRADING FOR SCREENINGS

Grading Classification	Size of Screenings	IS Sieve Designation	Per cent by weight passing the IS Sieve
A	13.2 mm	13.2 mm	100
		11.2 mm	95-100
		5.6 mm	15-35
		180 micron	0-10
B	11.2 mm	11.2 mm	100
		5.6 mm	90-100

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		60 180 micron	15-35
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TABLE 400-9. APPROXIMATE QUANTITIES OF COARSE AGGREGATES AND SCREENINGS REQUIRED FOR 100/75 MM COMPACTED THICKNESS OF WATER BOUND MACADAM (WBM) SLB-BASE/BASK COURSE

FOR 10M₂ AREA

Classification	Size Range	Compacted thickness	Lose Qty.	Screenings			
				Stone Screening		Crushable type such as Moorum or Gravel	
				Grading Classification & Size	For. WHM Sub-base/ base course (Loose quantity)	Grading Classification & Size	Loose Qty.
Grading 1	90 mm to 45 mm	100 mm	1.21 to 1.43m ₃	Type A 13.2mm	0.27 to 0.30 m ₃	Not uniform	0.30 to 0.30 m ₃
Grading 2	63 mm to 45mm	75 mm	0.91 to 1.07 m ₃	Type A 13.2mm	0.12 to 0.15 m ₃	-do	0.22 to 0.24 m ₃

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-do-	-do-	-do-	-do-	Type B 11.2mm	0.20 to 0.22 m ₃	-do-	-do-
Grading 3	53mm to 22.4mm	75 mm	-do-	-do-	0.18 to 0.21 m ₃	-do-	-do-

Binding material : Binding material to be used for water bound macadam as a filler material meant for preventing ravelling, shall comprise of a suitable material approved by the Engineer having a Plasticity Index (PI) value of less than 6 as determined in accordance with IS: 2720 (Part-5).

The quantity of binding material where it is to be used, will depend on the type of screenings. Generally, the quantity required for 75 mm compacted thickness of water

bound macadam will be 0.06-0.09 m₃/10m² and 0.08-0.10m₃/10m² for 100 mm compacted thickness. The above mentioned quantities should be taken as a guide only, for estimation of quantities for construction etc. Application of binding materials may not be necessary when the screenings used are of crushable type such as moorum or gravel.

Construction Operations

Preparation of base: The surface of the subgrade/ sub-base/base to receive the water bound macadam course shall be prepared to the specified lines and crossfall (camber) and made free of dust and other extraneous material. Any ruts or soft yielding places shall be corrected in an approved manner and rolled until firm surface is obtained if necessary by sprinkling water. Any sub-base/base/surface irregularities, where predominant, shall be made good by providing appropriate type of profile corrective course (levelling course) to Clause 501 of these Specifications.

As far as possible, laying water bound macadam course over an existing thick bituminous layer may be avoided since it will cause problems of internal drainage of the pavement at the interface of two courses. It is desirable to completely pick out the existing thin bituminous wearing course where water bound macadam is proposed to be laid over it. However, where the intensity of rain is low and the interface drainage facility is efficient, water bound macadam can be laid over the existing thin bituminous surface by cutting 50 mm x 50 mm furrows at an angle of 45 degrees to the centre line of the pavement at one metre intervals in the existing road. The directions and depth of furrows shall be such that they provide adequate bondage and also serve to drain water to the existing granular base course beneath the existing thin bituminous surface.

Inverted choke : If water bound macadam is to be laid directly over the subgrade, without any other intervening pavement course, a 25 mm course of screenings (Grading B) or coarse sand shall be spread

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on the prepared subgrade before application of the aggregates .istaken up. In case of a fine sand or silty or clayey subgrade, it is advisable to lay 100 mm insulating layer of screening or coarse sand on top of Fine grained soil, the gradation of which will depend upon whether it is intended to act as a drainage layer as well. As a preferred alternative to inverted choke, appropriate geosynthetics performing functions of separation and drainage may be used over the prepared subgrade as directed by the Engineer. Section 700 shall be applicable for use of geosynthetics.

Spreading coarse aggregates : The coarse aggregates shall be spread uniformly and evenly upon the prepared subgrade/sub-base/ base to proper profile by using templates placed across the road about 6 m apart, in such quantities that the thickness of each compacted layer is not more than 100 mm for Grading 1 and 75 mm for Grading 1 and 3, as specified in Clause 404.2.5. Wherever possible, approved mechanical devices such as aggregate spreader shall be used to spread the aggregates uniformly so as to minimise the need for manual rectification afterwards. Aggregates placed at locations which are inaccessible to the spreading equipment, may be spread in one or more layers by any approved means so as to achieve the specified results.

The spreading shall be done from stockpiles along the side of the roadway or

directly from vehicles. No segregation of large or fine aggregates shall be allowed and the coarse aggregate as spread shall be of uniform gradation with no pockets of fine material. The surface of the aggregates spread shall be carefully checked with templates and all high or low spots remedied by removing or adding aggregates as may be required.

The surface shall be checked frequently with a straight edge while spreading and rolling so as to ensure a finished surface as per approved drawings.

The coarse aggregates shall not normally be spread more than 3 days in advance of the subsequent construction operations.

Rolling: Immediately following the spreading of the coarse aggregate, rolling shall be started with three wheeled power rollers of 80 to 100 kN capacity or tandem or vibratory rollers of 80 to 100 kN static weight. The type of roller to be used

shall be approved by the Engineer based on trial run. Except on super elevated portions where the rolling shall proceed from inner edge to the outer, rolling shall begin from the edges gradually progressing towards the centre.

First the edge/edges shall be compacted with roller running forward and backward. The roller shall then move inward parallel to the centre line of the road, in successive passes uniformly lapping preceding tracks by at least one half width.

Rolling shall be discontinued when the aggregates are partially compacted with sufficient void space in them to permit application of screenings. However, where

screenings are not to be applied, as in the case of crushed aggregates like brick metal, laterite and kankar, compaction shall be continued until the aggregates are thoroughly keyed. During rolling, slight sprinkling of water may be done, if necessary. Rolling shall not be done when the subgrade is soft or yielding or when it causes a wave-like motion in the subgrade or sub-base course. The rolled surface shall be checked transversely and longitudinally, with templates and any irregularities corrected by loosening the surface, adding or removing necessary amount of aggregates and re-rolling until the entire surface conforms to desired crossfall (camber) and grade. In no case shall the use of screenings be permitted to make up depressions. Material which gets crushed excessively during compaction or becomes segregated shall be removed and replaced with suitable aggregates. It shall be ensured that shoulders are built up simultaneously along with water bound macadam courses as per Clause 407.4.1.

Application of screenings: After the coarse aggregate has been rolled to Clause 404.3.4, screenings to completely fill the interstices shall be applied gradually

over the surface. These shall not be damp or wet at the time of application. Dry rolling shall be done while the screenings are being spread so that vibrations of the roller cause them to settle into the voids of the coarse aggregate. The screenings shall not be dumped in piles but be spread uniformly in successive thin layers either by the spreading motions of hand shovels or by mechanical spreaders, or directly from tipper with suitable grit spreading arrangement. Tipper operating for spreading the screenings shall be so driven as not to disturb the coarse aggregate.

The screenings shall be applied at a slow and uniform rate (in three or more applications) so as to ensure filling of all voids. This shall be accompanied by dry rolling and brooming with mechanical brooms, hand-brooms or both. In no case shall the screenings be applied so fast and thick as to form cakes or ridges on the surface in such a manner as would prevent filling of voids or prevent the direct bearing of the roller on the coarse aggregate. These operations shall continue until no more screenings can be forced into the voids of the coarse aggregate. The spreading, rolling, and brooming of screenings shall be carried out in only such lengths of the road which could be completed within one day's operation.

Sprinkling of water and grouting : After the screenings have been applied, the surface shall be copiously sprinkled with water, swept and rolled. Hand brooms shall be used to sweep the wet screenings into voids and to distribute them evenly. The sprinkling, sweeping and rolling operation shall be continued, with additional screenings applied as necessary until the coarse aggregate has been thoroughly keyed, well-bonded and firmly set in its full depth and a grout has been formed of screenings. Care shall be taken to see that the base or subgrade does not get damaged due to the addition of excessive quantities of water during construction.

In case of lime treated soil sub-base, construction of water bound macadam on top of it can cause excessive water to flow down to the lime treated sub-base before it has picked up enough strength (is still “green”) and thus cause damage to the sub-base layer. The laying of water bound macadam layer in such cases shall be done after the sub-base attains adequate strength, as directed by the Engineer.

Application of binding material: After the application of screenings in accordance with Clauses 404.3.5 and 404.3.6, the binding material where it is required to be used (Clause 404.2.7) shall be applied successively in two or more thin layers at a slow and uniform rate. After each application, the surface shall be copiously sprinkled with water, the resulting slurry swept in with hand brooms, or mechanical brooms to fill the voids properly, and rolled during which water shall be applied to the wheels of the rollers if necessary to wash down the binding material sticking to them. These operations shall continue until the resulting slurry after filling of voids, form a wave ahead of the wheels of the moving roller.

Setting and drying: After the final compaction of water bound macadam course, the pavement shall be allowed to dry overnight. Next morning hungry spots shall be filled with screenings or binding material as directed, lightly sprinkled with water if necessary and rolled. No traffic shall be allowed on the road until the macadam has set. The Engineer shall have the discretion to stop hauling traffic from using the completed water bound macadam course, if in his opinion it would cause excessive damage to the surface.

The compacted water bound macadam course should be allowed to completely dry and set before the next pavement course is laid over it.

Surface Finish and Quality Control of Work

The surface finish of construction shall conform to the requirements of Clause 902.

Control on the quality of materials and works shall be exercised by the Engineer in accordance with Section 900.

The water bound macadam work shall not be carried out when the atmospheric temperature is less than 0°C in the shade.

Reconstruction of defective macadam: The finished surface of water bound macadam shall conform to the tolerance of surface regularity as prescribed in Clause 902. However, where the surface irregularity of the course exceeds the tolerances or where the course is otherwise defective due to subgrade soil mixing with the aggregates, the course to its full thickness shall be scarified over the affected area, reshaped with added material or removed and replaced with fresh material as applicable and recompacted. In no case shall depressions be filled up with screenings or binding material.

Arrangement for Traffic

During the period of construction, the arrangement of traffic shall be done as per Clause 112.

Measurements for payment

Water bound macadam shall be measured as finished work in position in cubic metres.

Rate

The Contract unit rate for water bound macadam sub-base/base course shall be payable in full for carrying out the required operations including full compensation for all

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components listed in Clause 401.8 (i) to (v) including arrangement of water used in the work as approved by the Engineer.

QUALITY CONTROL AND ASSURANCE

8- QUALITY ASSURANCE, CONTROL AND QUALITY MONITORING

It shall be the responsibility of the Contractor to ensure the quality of the materials to be used, quality of works to be executed as well as the quality of finished product as per technical specification in accordance with Indian Standards.

Contractor shall establish and maintain field laboratory suitably placed inside the Project area (including suitable building, furniture and equipment) at his own cost and conduct different quality control test on construction material, process control test on construction & quality control monitoring test on finished products. He shall appoint qualified & experienced technical staff as per requirement to conduct tests. Equipment as necessary to conduct the tests shall be procured by the contractor. A list indicating some of the main equipment are given below for reference of the Contractors. The Contractor shall also procure other equipment, if necessary, to conduct tests specified for different items of work to the satisfaction of the Project Manager.

<i>Sl. No.</i>	<i>Name of Equipment</i>	<i>Quantity for each Road</i>
i.	Post Hole Auger with extension	One Set
ii.	Digging tools like pick axe, shovel, hammer, chisel, etc	One Set
iii.	) IS Sieves with lid and pan (90 mm, 80mm, 63mm, 53mm, 45mm, 37.5mm, 26.5mm, 19mm, 13.2 mm, 11.2mm, 9.5mm, 4.75mm, 2.8mm, 5.6mm, 3.35mm, 2.36mm, 600 micron, 425 micron, 300 micron, 150 micron, 180 micron, 90 micron and 75 micron)	One Set

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iv.	Standard Proctor Density Test Apparatus with rammer	One Set
v.	Sand Pouring Cylinder with tray complete for field density test	One Set
vi.	Core Cutter (100 mm dia) 100mm/150mm height complete with dolly and hammer	One Set
vii.	Speedy moisture meter complete with chemicals	One Set
viii.	Straight Edges	Two Nos
ix.	Digital Thermometers	Three Nos
x.	Liquid Limit and plastic limit testing apparatus complete with Water bottle and glass wares	One Set
xi.	Gas burner, sand bath	One Set
xii.	Chamber Board	
xiii.	Electronic / digital balance 1 kg with the least count of 0.01 gm.	One No.
xiv.	Electronic / digital balance 20 kg	One No.
xv.	Pan balance with weight Box, 5 kg	One No.
xvi.	Oven (ambient to 200°C)	One No.
xvii.	Water bath (ambient to 100°C)	One No.
xviii.	Bitumen extraction apparatus	One No.
xix.	Penetration apparatus (Bitumen)	One No.
xx.	Enameled tray	Six Nos

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xxi.	Measuring tape, spatula, glassware, porcelain dish, pestle mortar.	One Set
xxii	Trays for measurement of tack coat quantity	Three Nos
xxii i.	Slump cone	Two Nos
xxi v.	Cube mould (150mmx150 mm x 150 mm)	Twelve Nos

The key equipments for field laboratory shall be:

QUALITY ASSURANCE PLAN

The Contractor shall, within fourteen (14) days from the Commencement Date, submit a Quality Assurance Plan. The plan shall include methodology & sequence of operation, list of materials sources, Quality Assurance & Quality control procedure to be followed prior to commencement of work and during execution, testing schedule showing test to be conducted and their frequencies & testing of end product, with respect to procedure laid down in different Indian Standards for each item of work & internal organisation ensuring good quality of constructions works, procedures for supplying of suitable materials, procedures for verification of drawings and other items as required by the Project Manager. The Contractor shall implement the quality control procedures in compliance with the approved Quality Assurance Plan.

CONSTRUCTION SUPERVISION

Supervision of construction work will be done by the Project Manager and his site staff on a day-to-day basis and periodically by the concerned Superintending Engineer and Chief Engineer in charge of the Project.

MATERIALS AND SAMPLES

The Contractor shall submit to the Project Manager a list of all suppliers of manufactured items from whom he proposes to purchase, and the locations of quarries, material sources from which he proposes to extract material aggregates, stones, fill materials etc. If the contractor is purchasing the aggregates from the vendor he should obtain the material from the licensed quarry where the Orissa Pollution Control Board has given Consent for Establishment and Operation for the crusher. In addition the Contractor should enclose a copy of the Consent for establishment and operation as part of the Vendor approval. All materials and articles shall, whether specified or otherwise, be suitable for the use intended and shall be approved by the Project Manager. Samples of all materials or articles to be incorporated in the Works as may be called for by the Project Manager or his Representative shall be submitted as and when required for retention by the Project Manager's Representative. Manufacturer's test certificates shall be supplied in respect of cement, steel, pipes, etc.

The Contractor shall maintain a detailed record of all materials delivered to his stores or working areas, and shall make these records available to the Project

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Manager's representative. All goods and materials used in the Permanent Works shall be new, unused, of the most recent or current models, and incorporate all recent improvements in design and materials unless provided otherwise in the Contract.

All materials and works rejected by the Project Manager's representative shall be promptly removed from the site.

INSPECTION AND TESTS

All materials and goods furnished and works performed under these specifications shall be subject to the inspection of the Project Manager or his authorized representative to determine that they meet the requirements of these specifications. The Contractor shall notify the Project Manager, not less than 15 days in advance of the date and place that the materials will be available for inspection. Acceptance of materials or the waiving of inspection, thereof, shall not relieve the Contractor of the responsibility for furnishing materials and goods or performing works in accordance with the requirements of the Contract Documents.

The Contractor shall conduct different approval test in Government approved Testing Laboratories prior to utilisation in the work.

The Contractor shall be responsible for delivering all samples to the laboratory and for collecting the results. The original test certificates shall be presented to the Project Manager for his review and approval.

The Contractor shall conduct quality control test on construction material, process control test on construction & quality control monitoring test on finished products in Q.C Field Laboratory with respect to procedure & frequencies laid down in different Indian Standards for each item of work.

The Contractor shall maintain quality control test registers made out of approved test formats of all tests & abstract submitted to Project Manager regularly.

Contractor shall maintain guard file & document all test results of approval test of construction materials conducted in government approved Q.C. Testing laboratory, & abstract submitted to Project Manager regularly.

The Contractor shall facilitate inspection & verification of testing, documentation of test result to the Project Manager or his authorized representative (Asst. engineer, Junior Engineer & supporting testing staff) to ascertain, the work has been executed as per approved Technical Specification.

The Contractor shall facilitate State Quality Monitors (appointed by D.O.W.R) & higher authorities of Project to inspect & conduct verification testing as and when required to ascertain the materials used in the work & the end products are of prescribed standards.

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The Contractor shall submit all the original quality control Test registers & guard file containing approval test results of materials to the Project Manager for record after completion of the work.

PROFORMA FOR OK REGISTER FOR QC

QUALITY CONTROL ARRANGEMENT.

a)	Person in-charge of QC.			
	Name			
	Designation			
	Base Lab			
	Name / Location of Base Lab			
b)	QC register /OK Card Produced		Yes	No
	Maintained properly		Yes	No
c)	Field Laboratory			
	Set Up		Yes	No
	Maintained by Borrow Area :			

Location		Km. from site	
Approved		Yes	No
Soil tested		Yes	No
Test Laboratory			
(Name / Location)			
Results pasted in QC Register		Yes	No

Drawing and Specifications:

Approved/ Working			
Drawing available at site		Yes	No
Specification available at site		Yes	No

During Inspection :

a) Earthwork was done in my presence from RD _____ to _____

b) I am satisfied/ not satisfied (state details if not satisfied) that proper procedure has been followed in the above work.

Yes

No

☐
☐
☐

Earth from approved borrow area has been stacked suitably and there is

☐

no excess earth.

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8.5.4 Field moisture content of stacked earth

OMC

_____ %

%

Type of spreading equipment

Earth was properly spread to _____ mm

Type of watering equipment

Type of compacting equipment

No. of passes

Field Dry Density

Percentage of compaction

Extra passes

Final Dry Density

Final percentage of compaction

Entered in QC register and OK Card.

CHECKLIST FOR CONCRETE

Drawing & Specification:

Drawing and Specifications:

Approved/ Working				
Approved by				
Specification available at site		Yes		No
Reinforcement grade of steel :				
Fine aggregate Quality :				
Water Quality :				
Coarse aggregate Quality :				
Cement grade :				
Minimum cement in Kg/cum. :				
Maximum cement in Kg./cum. :				
Admixture quality :				

Arrangement :

Safety of centering and shuttering

Stand by equipments :

Lightning arrangement :

Stand by vehicle for emergency

	Yes		No
	Yes		No
	Yes		No
	Yes		No

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Compressor/ Green cut arrangement

Yes

No

Curing Arrangement

Yes

No

Tests conducted :

Cement

Yes

No

Reinforcement

Yes

No

Course Aggregate

Yes

No

Fine Aggregate

Yes

No

Water

Yes

No

Design Mix done

Yes

No

Laboratory where mix design done

Cube tests and their results

OK

Not

Field test conducted during inspection/
observation :

Grading of coarse aggregate

Yes

No

Grading of fine aggregate

Yes

No

Silt content of sand

Yes

No

Bulkage of sand

Yes

No

Type of Cement

Date of manufacture of cement

Yes

No

Observed slump

Sample of concrete

Taken

No

Sample No. of cubes

Weight of cement used per Batch

Weight of Coarse aggregate

Kg.

Weight of Fine aggregate

Kg.

Quality of water

Kg.

Grade of steel used

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Spacing as per drawing

☐

Yes

☐

No

Cover OK

☐

Yes

☐

No

Laps OK

☐

Yes

☐

No

Walk way provided

☐

Yes

☐

No

Status of old concrete OK

☐

Yes

☐

No

Status of cube test results OK

☐

Yes

☐

No

Non destructive test required

☐

Yes

☐

No

Recording in QC register

☐

Yes

☐

No

8.6 CHECKLIST FOR ROAD WORKS**8.6.1 Pre-construction Tests:**

Soil Tested

☐

Yes

☐

No

Type of soil

Liquid Limit

CBR value Tested

☐

Yes

☐

No

Borrow area specified

☐

Yes

☐

No

Availability of test report

☐

Yes

☐

No

Recorded in QC register

☐

Yes

☐

No

Density of soil

Test Laboratory

(Name/ Location)

OMC

MDD

Suitability

☐

Yes

☐

No

8.6.2 Test during Inspection:

Thickness of layer OK

☐

Yes

☐

No

Moisture content

☐

Yes

☐

No

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MDD

Percentage of compaction

Profile of Road OK

Recording in QC register

	Yes		No
	OK		No
	Yes		No
	Yes		No

Granular Sub-base:

Pre-construction Tests:

Test of moorum & soil admixture

Proportion of admixture

Liquid limit

CBR value

Tested P.I.

OM

C

MD

D

Grading

Tested at Lab.

Test results available at site

	Yes		No
	Yes		No
	OK		Not
	Govt.		Private
	Yes		No.

	Yes	
	OK	
	OK	
	Yes	
	Yes	

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8.7.2 Test during Inspection :

Thickness of layer OK	No
Grading	Not
OMC	
MDD	
Percentage of compaction	Not
Profile of Road OK	No
Recording in QC register	No

W.B.M. items :

Tests in Base Lab :

Physical properties of coarse aggregate	Yes	No
Grading of coarse aggregates	Yes	No
Screening material	Yes	No
Liquid Limit of Screening materials		
P.I. of screening materials		
% finer to 75 micron sieve for screening materials		
Tested at Lab	Govt.	Private
Test results available at site	Yes	No

	Yes	
	OK	
	Yes	
	Yes	
	Yes	
	Yes	

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8.8.2 Test during inspection :

Thickness of layer OK	No
Grading of coarse aggregate	Not
Grading of screening OK	No
Profile of Road OK	No
Surface irregularly OK	No
% finer to 75 micron sieve	
Recorded in QC register	No

3.9 Bituminous items :

8.9.1 Test in Base Lab :

Physical properties of coarse aggregate	☐	Yes	☐	No
Grading of coarse aggregate	☐	Yes	☐	No
Properties of bitumen/Emulsion	☐	Yes	☐	No
Test results available at site	☐	Yes	☐	No
Test conducted at laboratory	☐	Govt.	☐	Private

8.9.2 Test during inspection :

Bitumen/Emulsion content in

Prime coat/ tack coat/ seal coat/ PMC

Mixing temperature

Laying temperature

Thickness of layer

Profile of Road OK

Surface irregularity OK

Grading of coarse aggregate

Record in QC register

☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No
☐	Yes	☐	No

Contractor**Senior Manager (Civil)**

Quality supervision

Arrangement during execution OK.

Quality monitoring arrangement OK

Rectification and compliance to defects

Suggestion for improvement to be recorded in

QC register

☐

Yes

☐

No

Yes

No

☐
☐

Yes

No

☐
☐

Yes

No

☐
☐

Contractor

Senior Manager (Civil)