



Tender for Road Work Within The Manicktala Factory Complex, All Around The Betalactum Block, East side of Cephalosporin Block & Road to repair the cable trenches made by CESE & Roads to Sub Station Area.



BENGAL CHEMICALS & PHARMACEUTICALS LTD

(A Govt. of India Enterprise)

**Bengal Chemicals & Pharmaceuticals Limited
168 Manicktala Main Road, Kolkata-700054
West Bengal, India.**

Tender for Road Work within the Manicktala Factory Complex, All Around The Betalactum Block, East side of Cephalosporin Block & Road to repair the cable trenches made by CESE & Roads to Sub Station Area.

NIT

Tender No	BCPL/LT/Project/Road/02/15-16
Tender Date	04 th April, 2015
EMD (Mandatory, without EMD, no bidder will qualify the technical round)	Rs: 40,000/-
Demand Draft Address	All DD will be in favor of Bengal Chemicals & Pharmaceuticals Limited, payable at Kolkata.
Address for Bid submission & Evaluation	Purchase Department, Bengal Chemicals & Pharmaceuticals. 168, Manicktala Main Road, Kolkata –700 054.
Last date & Time of Bid Submission	20th April, 2015 up to 3:00Pm
Opening of Bid	20 th April, 2015 up to 3:30Pm
Venue for Bid submission & Opening	Purchase Department, Bengal Chemicals & Pharmaceuticals Ground Floor of Manicktala Main Office, Manicktala Main Road, Kolkata – 54.

SCOPE OF WORK

The scope of work under this tender covers construction of ROAD WORK WITHIN THE BCPL'S MANIKTALA FACTORY COMPLEX ,ALL AROUND THE BETALACTUM BLOCK, EAST SIDE OF CEPHOLOSPORIN BLOCK AND ROAD TO REPAIR OVER THE CABLE TRENCHES MADE BY CESE & ROADS TO SUB STATION AREA for further details refer to attached Bill of quantity (BoQ).

COMPLETION PERIOD: 45 days from the date of issue of LOI/ Work order.



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Eligibility Criteria:

The Tenderer to qualify the below criteria for participating in this tender,

- Tenderer must have executed under their Company/ firm's name & style at least 3(three) similar type of order for civil construction, repair and of similar type of work.
- Documentary evidence (duly signed & stamped) must be enclosed with the bid.
Tenderer must have valid registration certificate for Sales Tax, Income Tax, Provident Fund / ESI and Trade License.

(Documentary Evidence to be accompanied the technical Bid)

Bid submission Criteria:

Bidders to submit their Bids under two separate sealed covers, one cover containing Part 1 (Un-priced Bid / Technical Bid) & the other cover containing Part 2 (Priced Bid / Commercial Bid). Indicating Tender Name, No, Date with Tender Due Date.. These two bids should be submitted in a single sealed cover with the respective Tender No & Item. Mentioned thereon, complete in all respect, addressed to the DM (Purchase), BENGAL CHEMICALS & PHARMACEUTICALS LTD, 168, MANIKTALA MAIN ROAD, KOLKATA-700 054.

VALIDITY OF OFFER:

Bidders shall keep their offer valid for a period 90 days from the due date / extended due date (if any) of the tender-opening.

NON-CONFORMANCE

Tenders not conforming to the above mentioned requirement are liable to be rejected.

RIGHT OF ACCEPTANCE / REJECTION

Mere issue of tender document and submission of bids does not necessarily qualify for consideration of bids Bengal Chemicals & Pharmaceuticals Ltd reserve the right to accept or reject any tender either in part or in full without assigning any reason whatsoever.

CLARIFICATIONS

For any clarifications on technical matter please contact Manager Projects & Engineering, BCPL, Manicktala, phone No: (033) 2320-4153 (Ext-108), Mobile no: +91-9830851116. For clarification on commercial matter please contact Deputy Manager (Purchase), BCPL; Ph (033)2320-4153 (Ext-150), Mobile No: +91-8014003257

Terms of payment

- a) **10%** of Contract Value will be paid as mobilization advance against submission of Bank Guarantee (BG) of any Nationalized Bank of India for equal amount which shall remain valid for a period of contract period with claim period of 3 months.
 - b) Payment will be done against submission of RA bills on pro-rata Basis after deduction of retention money. (Minimum RA bill amount shall be Rs 5 Lakh)
- I. Work measurement shall certified by the Owner's Engineer-in Charge .
 - II. This payment will be subject to deduction of Retention Money. **10%** (Ten percent) of the Bill Value.



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c) **Retention money: 10%** (Ten percent) of the billed value shall be deducted as retention money from each RA bill which will be released after completion of Defect Liability Period / Guarantee Period , which is 12months from the date of handing over/ completion certificate. The retention money shall be released against submission of Bank Guarantee of equal amount, from any Nationalised Bank of India valid for 12 months (from date of handing over) with a claim period of additional 3 months.

Guarantee/ Defect Liability Period

Contractor shall provide full guarantee against any poor workmanship/inferior design or quality etc. for a period of 12months from the date of handing over. During this period contractor will arrange to repair/replace any defective part free of cost or replace item if required.

Material, Equipment, Water & Power required for road construction:

All the material and necessary equipments (road roller, bitumen mixer etc) for executing this contract shall be arranged by the contractor of their own. Water required for the road construction can be taken from the nearby pond inside the BCPL's Manicktala factory with necessary pumping arrangement (Pumping and piping arrangement to be done by the contractor of their own). However power (if required) during the execution of work will be given by BCPL at single point free of cost.

INSPECTION:

Materials on its arrival at Client's site will be inspected by Stores In-charge / Client's Representative and Engineer-in-charge and their decision in the matter will be final & binding upon also to the vendor.

Technical Specification:

Works will be executed as per CPWD specification with all updated correction slips, the details technical specification is attached as Annexure- I.

Drawing: Drawing for the road work is attached as Annexure-II.

TEST CERTIFICATES:

Test Certificates, shall be obtained and furnished to the client free of cost along with the supply. Client reserve the right to avail third party for inspection and testing.

Dispute if any to be settled within BCPL, Manicktala, Kolkata jurisdiction.

STAMPED & SIGNED BY THE BIDDER



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FORM OF BID

(To be submitted by the Bidder)

M/s.
BCPL, Kolkata

Sub :

Dear Sir,

1. Having carefully examined all the Tender documents attached to your Invitation to Bid No. Dated, and its Amendments / Errata / Corrigendum / Clarifications issued till the date of tender opening, we agree to complete the WORKS in conformity with all the terms and conditions stated in Tender Documents and its Amendments / Errata / Corrigendum / Clarifications issued till the date of tender opening and as per time schedule given in Tender Document. The Plant, Equipment and System offered are of best and of latest technology and of international standards.
2. I / We declare and certify that I / We fully satisfy the Qualifying Requirements and the documentary proof as called for, have been annexed.
3. We undertake, in case our bid is accepted, to commence the work from the date of Letter of Award and to complete and deliver the whole of the work and responsibilities comprised in the contract as per time schedule given in Tender Document.
4. We agree to abide by and keep our Bid valid initially for a period of 3 months from the date of opening of Bid and it shall remain binding on us and may be accepted at any time before the expiry of that period.
5. Should our Bid be accepted, we hereby agree to abide by and fulfill all Terms and Conditions of Tender Document as accepted by us. We understand that BENGAL CHEMICALS AND PHARMECUTICALS LTD is not bound to accept the lowest or any Bids received and BENGAL CHEMICALS AND PHARMECUTICALS LTD has the right to reject a bid, without assigning any reason whatsoever.
6. This Bid together with written acceptance by way of Work Order thereof, shall constitute a binding CONTRACT between BENGAL CHEMICALS AND PHARMECUTICALS LTD. and ourselves till any formal contract is executed.
7. Dated this _____ day of _____.

Witness – Authorised Signature

Signature

Occupation

Date

Address

Witness --: DESIGNATION

STAMPED & SIGNED BY THE BIDDER

SCHEDULE OF CONFIRMATION



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Questionnaire on Commercial Points to be answered by the Bidder

1.0 Name of Bidder Firm/Company

1.1 Address :

1.2 Telephone No. :

1.3 Fax. No. & E-mail Address :

1.4 Banker's Name & Address :

1.5 Name & Full address of Chief executive :

1.6 Name, Designation and full address of contact person :

Cell No. ,

E-mail address.

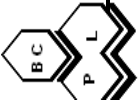
1.7 Place of manufacture of supply item :

1.8 Other information if any (enclose separate sheets) :

1.9 VALIDITY OF BID

2.0 Please confirm the validity of Bid to be 3 months:

STAMPED & SIGNED BY THE BIDDER

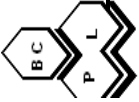


BILL OF QUANTITY AND PRICE BID FORM

Sl. No	DESCRIPTIONS OF ITEMS.	UNIT	QTY	RATE (in Rs)	AMOUNT (in Rs)	REMARKS
1	Clearing grass and removal of the rubbish upto a distance of 50 m outside the periphery of the area cleared.	100sqm	903.35			
2	Felling trees of the girth (measured at a height of 1 m above ground level), including cutting of trunks and branches, removing the roots and stacking of serviceable material and disposal of unserviceable material.					
	(a) Beyond 30 cm girth upto and including 60 cm girth .	Each	1			
	(b) Beyond 60 cm girth upto and including 120 cm girth	Each	2			
	(c) Beyond 120 cm girth upto and including 240 cm girth	Each	1			
3	Earth work in excavation by mechanical means (Hydraulic excavator) / well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed. All kinds of soil.	Cum	225			
4	Preparation and consolidation of subgrade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm. depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth lead up to 50 metres	Sqm	1796.2			
5	Supplying & stacking at site:					
	(a) 90 to 45mm size stone aggregate .	Cum	180			

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Sl. No	DESCRIPTIONS OF ITEMS.	UNIT	QTY	RATE (in Rs)	AMOUNT (in Rs)	REMARKS
	(b)63mm to 45mm size stone aggregate.	Cum	170			
	(c)53mm to 22.4 mm size stone aggregate	Cum	170			
	(d) Stone screening 11.2 mm nominal size (type B)	Cum	80			
6	Laying spreading and compacting stone aggregate of specified sizes to WBM specifications including spreading in uniform thickness, hand packing, rolling with 3-wheeled road/vibratory roller 8-10 tonne in stages to proper grade and camber, applying and brooming requisite type of screening/binding material to fill up interstices of coarse aggregate watering and compacting to the required density.	Cum	600			
7	Scarifying metalled (water-bound) road surface including disposal of rubbish less up to 50 m and consolidation of the aggregate received from scarifying with power roller of 8 to 10 tonne capacity	Cum	1729.7			
8	Providing and applying tack coat using hot straight run bitumen of grade 80/100 including heating the bitumen, spraying the bitumen with mechanically operated spray unit fitted on bitumen boiler, cleaning and preparing the existing road surface as per cpwd specifications: On WBM @0.75 kg/sqm.	Sqm	1796.2			
9	2.5 cm premix carpet surfacing with 3 cum of stone chippings 10 mm nominal size per 100 sqm and bitumen emulsion (medium setting min 65% bitumen contents) complying with IS:8887-1995 using 96 kg per cum of chippings of road surface including consolidation with road roller etc complete (tack coat to be paid for separately):	sqm.	1796.2			
10	Providing and laying seal coat of premixed fine aggregate (passing 2.36 mm and retained on 180 micron sieve) with bitumen using 128 kg of bitumen of grade 80/100 bitumen per cum of fine aggregate and 0.60 cum of fine aggregate per 100 sqm of road surface including rolling and finishing with road roller all complete.	Sqm	1796.2			



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Sl. No	DESCRIPTIONS OF ITEMS.	UNIT	QTY	RATE (in Rs)	AMOUNT (in Rs)	REMARKS
12	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level (Precast): (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size)	Cum	0.3663			
13	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level. Cold twisted bars .	Kg	72			
14	Disposed off excavated earth to a lead of 2.00 Km by Mechanical transportation including loading unloading and stacking of service materials if available.	Cum	412			
	Grand Total (in Figure)					
	Grand Total (in Words)					

Bidders are requested to sign & stamp in all pages of bid document and submit in the technical bid (Un-Priced/Technical Bid)

**BOQ/Price bid to be printed on bidder's letter head and submit inside the Price Bid
(Commercial Envelop)**

**DM(Purchase)
BCPL, Manicktala, Kolkata – 54.**



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Annexure-I
TECHNICAL SPECIFICATION FOR ROAD WORKS

1.0 GENERAL

- 1.01 The specifications and mode of measurements for all the works mentioned in this tender shall be in accordance with C.P.W.D specifications 1996 volumes I to VI.

Unless otherwise specified in the nomenclature of individual item or in the specifications, the entire work shall be carried out as per the C.P.W.D specification with upto date correction slips upto the date of opening of tender.

- 1.02 For Items not covered under CPWD specifications mentioned above, the work shall be executed as per "Specifications for Road & Bridge Work" published by Ministry of surface transport, "Hill Road Manual" (IRC:SP:48-1998) published by the Indian Road Congress, and as per relevant standards/codes published by BIS (formerly ISI) inclusive of all amendments issued thereto or revision thereof, if any, upto the date of opening Tender.
- 1.03 In case of BIS (formerly I.S.I) codes/specifications are not available, the decision of the Engineer based on acceptable sound engineering practice and local usage shall be final and binding on the contractor.
- 1.04 However, in the event of any discrepancy in the description of any item as given in the schedule of quantities or specifications appended with the tender and the specifications relating to the relevant item as per CPWD specifications mentioned above or in drawings the former shall prevail.
- 1.05 The rates for different items of work shall be for all heights, lifts, leads and depths except where otherwise specified in the item of work or in additional conditions appended with the tender.



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- 1.06 The work shall be carried out in accordance with the approved drawings. The drawings shall have to be properly co-related before executing the work. In case of any difference noticed between the drawings, final decision, in writing of the Engineer shall be obtained by the contractor. For items, where so required, samples shall be prepared before starting the particular items of work for prior approval of the Engineer and nothing extra shall be payable on this account.
- 1.07 Unless otherwise specified in the bill of quantities, the rates for the items of work shall be considered as inclusive of pumping out or bailing out water if required for which no extra payment will be made. This will include water encountered from any source such as rains, floods, sub-soil water table being high due to any other cause whatsoever.
- 1.08 Any cement slurry added over base surface (or) for continuation of concreting for bond is added its cost is deemed to have in built in the item unless otherwise/explicitly stated and nothing extra shall be payable or extra cement considered with consumption on this account.
- 1.09 The rate for all items in which the use of cement is involved in inclusive of charges for curing.
- 1.10 The contractor shall clear the site thoroughly of all scaffolding materials and rubbish etc. left out of his work and dress the site to the satisfaction of the Engineer before the work is considered as complete.
- 1.11 The rate quoted for all brick /concrete work shall be deemed to include making openings and making good these with the same specifications as shown in drawings and / or as directed. No extra payment shall be made to the contractor on this account.
- 1.12 The drawing(s) attached with the tender documents are for the purpose of tender only, giving the tenderer a general idea of the nature and the extent of works to be executed. The rates quoted by the tenderer shall be deemed to be for the execution of works taking into account the "Design Aspect" of the items and in accordance with the "Construction Drawings" to be supplied to the Contractor during execution of the works.



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- 1.13 The quoted rate shall be for finished items and shall be complete in all respects including the cost of all materials, labour, tools & plants, machinery etc., all taxes, duties, levies, octroi, royalty charges, statutory levies, cess etc. applicable from time to time and any other item required but not mentioned here involved in the operations described above. EPI shall not be supplying any materials, labour, plant etc. unless explicitly mentioned so.
- 1.14 Gradient of road shall be as per approved drawing and as per direction of Engineer –in-Charge.
- 1.15 Random Rubble Masonry retaining wall shall be constructed as per approved drawings based on different heights at different locations and payment for the same shall be made as per the rates of respective items available in the Bill of Quantities.
- 1.16 RCC culverts of larger sizes may be required to be constructed as per actual requirement at site. The contractor has to execute this work and payment shall be made as per the rates of respective items available in the Bill of Quantities.

2.0 **MATERIALS**

2.01 **Stone Aggregate**

For WBM construction stone metal grade – I& II of hard granite or equivalent as approved by Engineer-in-Charge shall be used. River borne or weathered stone metal shall not be used for the work. The stone metal and aggregates shall not be obtained from the rock which has been exposed to atmosphere for a long time. They shall be clean, hard, durable of fairly cubical shape and free from excess flat, elongated, soft & disintegrated particles, fracture, cleavage, dirt & other deleterious materials and organic impurities. The aggregates shall preferable be hydrophobic and low porosity. The aggregates shall satisfy the physical requirements as set forth in Table I.



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Table – I (Physical Requirement of Coarse Aggregate)

<u>Sl. No.</u>	<u>Type of Construction</u>	<u>Type of Construction Test</u>	<u>Test Method</u>	<u>Requirement</u>
1.	Sub-Base	Los Angeles Abrasion Value or Aggregate Impact Value	IS-2386 (Part-IV) IS-2386 (Part-IV) IS-5640***	60% (Maximum) *50% (Maximum)
2.	Base	Los Angeles Abrasion Value or Aggregate Impact Value Flakiness Index	IS-2386 (Part-IV) IS-2386 (Part-IV) IS-2386 (Part-I)	50% (Maximum) *40% (Maximum) **15%
(Maximum)				
*	Aggregates may satisfy requirements of either of the two tests.			
**	The requirements of flakiness index shall be enforced only in case of crushed / broken stone ..			
***	Aggregates like brick metal, kankar and laterite which get softened in presence of water, shall be tested for impact value under wet conditions in accordance with IS:5640.			

2.02 Sand / Stone Dust

Sand/ Stone dust shall be clean, hard durable, uncoated, dry and free from injurious soft or flaky pieces and organic or deleterious substances. Quality of sand/ stone dust shall conform to IS: 383.



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2.03 Supply and stacking of materials

Stone metal, boulder, sand, stone dust etc.

Ground where stacks are proposed to be made shall be cleared, leveled or dressed to a uniform slope and all lumps, depressions etc. shall be removed. The stacked material shall be free from vegetation and other undesirable material. All rejected materials shall be immediately removed from site.

Stone metal and boulder shall be stacked in convenient units of one metre top width, 2.2 m bottom width, 60 cm height and of length in multiples of 3 meter. Template of wood or steel shall be used for making the stack and shall always be kept at site for check measurements.

Sand or stone dust shall be stacked in convenient units of one cum. The stack shall be made with wooden boxes open at both ends and of 2 m x 2 m x 0.25 m dimensions. These boxes shall always be kept at site for stacking and check measurements.

The stacks shall be uniformly distributed along the road side and shall be numbered serially. The number plate shall be planted on each stack which shall remain in position until the stack is used in the work.

Sample of materials shall be got approved from Engineer-in-Charge before the material in bulk is brought to the site.

2.03 Measurement for Payment

Length, breadth and height shall be measured correct to a cm and volume shall be calculated in cum correct to two places of decimal. The volume of stacks shall be reduced by percentage as shown below on account of voids to arrive at the net quantity for payment.



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Earth

i)	In loose stacks such as cart loads, lorry etc.	-	20%
ii)	In consolidated fills	-	10%
iii)	In fills consolidated by heavy mechanical machinery but not under OMC	-	5%
iv)	In fills consolidated by heavy mechanical machinery at OMC	-	Nil
v)	Consolidated fills in confined situation such as under floors	-	Nil
vi)	Sand/ Stone dust	-	Nil
vii)	Moorum	-	Nil
viii)	Stone metal 40 mm nominal size and above	-	7.5%
ix)	Coarse Aggregate below 40 mm nominal size	-	Nil
x)	Soling Stone / Boulder – 100 mm nominal size and above	-	15%
xii)	Excavated Rock	-	50%

Unless otherwise directed, measurement shall not be taken until sufficient materials for use on the road have been collected and stacked. Immediately after measurement the stack shall be marked by white wash or other means as directed by Engineer-in-Charge.

3.0 ROLLING:

3.01 Rolling shall be done by 80 / 100 KN smooth wheeled power roller (3 wheel or tandem) or vibratory roller of 80 – 100 KN static weight. Rolling shall start as soon as possible after the materials have been spread, deploying a set of rollers as the rolling is to be completed in limited time frame. Rolling shall be done with care to avoid unduly roughening of the pavement surface. The roller shall move at a speed not more than 5 km / hour.

Rolling of longitudinal joints shall be done immediately behind the paving operation. After this the rolling shall commence at the edges and progress towards the centre longitudinally, except that on super elevated and uni-directional cambered portions, where the rolling shall proceed from inner edge to the outer parallel to the centre line of the pavement. 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 precedings tracks by at least one-half width of WBM.



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When the roller has passed over the whole area once, any high spots or depressions which become apparent shall be corrected by removing or adding mix material. The rolling shall be continued till the entire surface has been rolled to 95% of the Proctor's density, there is no crushing of aggregates and all roller marks have been eliminated. Roller shall not stand on newly laid material while there is a risk that surface will be deformed thereby.

3.02 Time Schedule for Rolling Operations

The minimum duration for rolling shall be governed by the guidelines set forth in Table-3. However, Engineer-in-Charge shall have the full authority to increase the duration to an extent as he may deem necessary, to satisfy himself that the compaction must comply with the specifications.

Table-3

Sl. No.	Items	Duration	Surface Area / Volume
1.	Preparation of Sub-grade	1 hour	200 sqm
2.	75 mm thick WBM with Stone Metal Grade – II	1 hour	50 sqm
3.	150 mm thick WBM with Stone Metal Grade – I	1 hour	100 sqm

3.03 Rates

The contract unit rate for the work shall be payment in full for carrying out the required operations including full compensation for

- (i) Making arrangements for traffic to Clause 112 of 'Specifications for Road & Bridge Works' published by Ministry of Surface Transport except for initial treatment to verge, shoulders and construction of diversion.
- (ii) Preparation of base except for laying of profile corrective course but including filling of pot holes.



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- (iii) Providing all materials to be incorporated in the work including the arrangements for stockyard, all royalties, octroi, fees, cess, rents where necessary and all leads and lifts.
- (iv) All labour, tools, equipment, power supply units and all machines incidental to complete the work to the specifications.
- (v) Carrying out the work in part widths of the road, wherever directed.
- (vi) Carrying out all tests for quality control.

4.0 **SURFACE FINISH**

4.01 **CONTROL OF ALIGNMENT LEVEL & SURFACE REGULARITY**

4.02 **General**

All works to be performed shall conform to the lines, grades, cross-sections and dimensions shown on the drawings or as directed by Engineer-in-Charge, subject to the permitted tolerances described hereinafter.

4.03 **Horizontal Alignment**

Horizontal alignment shall be reckoned with respect to the entire line of the carriageway as shown on the drawings. The edges of the carriageway as constructed shall be correct within a tolerance of +/- 10 mm there from. The corresponding tolerance for edges of the roadway and lower layers of pavement shall be +/- 25 mm.

4.04 **Surface Levels**



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Where the surface is high, it shall be trimmed and suitably compacted. Where the surface is low, the deficiency shall be corrected by scarifying the lower layer and adding fresh material and re-compacting to the required density.

4.08 WBM (Sub-base / Base Course)

Where the surface is either high or low, the course to its full thickness shall be scarified over the affected area, reshaped with added material or removed and replaced with fresh material and re-compacted to the required density. In no case shall depressions be filled up with screenings or binding material.

5.0 **EARTH WORK**

5.01a EARTH WORK IN FILLING

Earth work in filling in banks shall be done in layers, each layer not exceeding 20 cm in thickness and should be properly watered to maintain the optimum moisture content. Consolidation of every 3rd layer (alternate layer) and the top-most layer should be done with power roller of minimum 80-100 KN capacity and got approved by Engineer-in-Charge before compacting the next layer. Required quantity of earth should be obtained from borrow-pits, the sites of which should necessarily be approved by Engineer-in-Charge. No borrow-pits should be dug within 4.5 m of toe of the final section of the embankment. Necessary witness should be left for the purpose of measurement of quantity of earth excavated and used in embankment. Proper profiles of embankment shall be maintained. Requisite allowance in height varying from 25 – 50 mm as directed by Engineer-in-Charge shall be left for settlement. Side slopes shall be maintained strictly as per drawings.

5.01b Earthwork in filling shall be measured in compacted volume of finished work in cubic metres.

5.02 EARTH WORK IN EXCAVATION

General



**Tender for Road Work Within The Manicktala Factory Complex, All Around The
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All excavation shall be carried out in conformity with the lines, grades, side slopes and levels shown on the drawings or as directed by the Engineer-in-Charge. The contractor shall not excavate outside the limits of excavation. After excavation, the sides of excavated area shall be trimmed and the area contoured to minimize erosion and ponding, allowing for natural drainage to take place.

Rock, when encountered in road excavation, shall be removed upto the formation level. Rocks and large boulders which are likely to cause differential settlement and also local drainage problems should be removed to the extent of 500 mm below the formation level in full formation width.

5.03 Slope in cutting and filling at hill side and valley side shall be as per direction of Engineer In-Charge.

5.04 Disposal of Excavated Materials

All the excavated materials shall be the property of the Employer. The materials obtained from excavation shall be used for filling in the adjacent embankments as directed by the Engineer-in-Charge. All hard rocks, not intended for use shall be stacked neatly on specified land as directed by the Engineer-in-Charge.

Unsuitable and surplus materials not intended for use shall be transported and disposed clear of the site as directed by the Engineer-in-Charge.

6.0 PREPARATION OF SUB-GRADE

The optimum moisture content should always be maintained by sprinkling requisite quantity of water in order to keep the sub-grade in established condition in accordance with the direction of Engineer-in-Charge. The sub-grade must not be allowed to become dry and break-up for want of cohesion. The final sectioning should be done to proper camber, gradient and super elevation with the help of template and strings. The rate of preparation and consolidation of sub-grade includes earth work in cutting and filling upto 22.5 cm thickness, if necessary, in order to achieve the desired profile. The dressed surface should be properly consolidated by rolling with power road roller of minimum 80-100 KN capacity.



**Tender for Road Work Within The Manicktala Factory Complex, All Around The
Betalactum Block, East side of Cephalosporin Block & Road to repair the cable tranches made
by CESE & Roads to Sub Station Area.**

7.0 WATER BOUND MACADAM (SUB – BASE / BASE COURSE)

7.01 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 sub grade 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 Engineer-in-Charge. It is 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 exiting bituminous surface and WBM.

7.02 MATERIALS

7.021 Coarse Aggregate

Coarse Aggregates shall conform to the grading requirement as set forth in
Table – 5

Size of Aggregate	IS Sieve Designation	% by Weight Passing IS Sieve
Grade – I (45 mm to 90 mm)	100 mm	100
	80 mm	65-85
	63 mm	25-60
	40 mm	0-15
	20 mm	0-05
Grade – II (45 mm to 63 mm)	80 mm	100
	63 mm	90-100
	50 mm	35-70
	40 mm	0-15
	20 mm	0-05



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7.022 Stone Screenings

Screening to fill voids in the coarse aggregates shall generally consist of the same material as the coarse aggregate. Screening shall conform to the grading requirements as set forth in Table – 6.

Table – 6

Size of Screenings	IS Sieve Designation	% by Weight Passing IS Sieve
13.2 mm	13.2 mm	100
	11.2 mm	95-100
	5.6 mm	15-35
	180 micron	0-10

7.023 Proportioning of Materials

Approximate quantities of coarse aggregate and stone screenings required for Water Bound Macadam base / sub-base course shall be as mentioned in Table-7.

Table - 7

(Quantity for 10 Sqm Area)

Classifi- cation	Size / Range	Compacted Thickness	Net Quantity	Stone Screening		Binding Material
				Grading Classification & Size	For WBM Sub- base / Base Course (Net Quantity)	
Grade – I	45 mm – 90 mm	100 mm	1.245 m ³	Type-A (13.2 mm)	0.285 m ³	0.10 m ³
Grade – II	45 mm – 63 mm	75 mm	0.935 m ³	Type-A	0.135 m ³	0.09 m ³



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Classifi- cation	Size / Range	Compacted Thickness	Net Quantity	(13.2 mm)	Binding Material	
				Stone Screening		
				Grading Classification & Size		For WBM Sub- base / Base Course (Net Quantity)
Grade – I	45 mm – 90 mm	100 mm	1.245 m ³	Type-A (13.2 mm)	0.285 m ³ 0.10 m ³	

CONSTRUCTION OPERATIONS

7.031 Preparation of Base

The surface of the sub grade / sub-base base to receive the Water Bound Macadam course shall be prepared to the specified lines grades & camber and made free of dust and other extraneous material. Any 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 (leveling course)

7.032 Spreading Coarse Aggregates

The coarse aggregate shall be spread uniformly and evenly upon the prepared sub-grade to proper profile by using templates placed across the road about 6m apart in such quantities that the thickness of each compacted layer is not more than 100mm for Grade-I and 75 mm for Grade-II. Wherever possible, approved mechanical devices such as aggregate spreader shall be used to spread the aggregates uniformly so as to minimize the need for manual rectification afterwards.

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



Tender for Road Work Within The Manicktala Factory Complex, All Around The Betalactum Block, East side of Cephalosporin Block & Road to repair the cable tranches made by CESE & Roads to Sub Station Area.

7.033 Rolling

Immediately following the spreading of the coarse aggregates, rolling shall be started with three wheeled Power Roller of 80-100 KN capacity or Vibratory Rollers of 80-100 KN static weight. The type of roller to be used shall be approved by the Engineer-in-Charge based on trial run Rolling shall be discontinued when the aggregates are partially compacted with sufficient void space in them to permit the application of stone screenings.

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 grade and camber. In no case shall be 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.

7.034 Application of Screenings

After the coarse aggregate has been rolled completely, 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 aggregates. 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.

The screenings shall be applied at a slope 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 or hand brooms.

7.035 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 operations 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 sub-grade does not get damaged due to the addition of excessive quantity of water during construction.



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7.036 Application of binder Material (Moorum / Stone Dust)

After the application of stone screening in accordance with Clauses 8.034 and 8.035 the binding material where it is required to be used 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 roller if necessary to wash down the binding material sticking to them. These operations shall continue until the resulting slurry after filling of voids forms a wave ahead of the wheels of the moving roller.

7.037 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 bending materials as directed, lightly sprinkled with water if necessary and rolled. No traffic shall be allowed on the road until the macadam has set.

7.038 Measurement for Payment

Water Bound Macadam shall be measured as finished work in cubic meters.

LIST OF APPROVED MAKE

- | | |
|----------------------------------|--|
| 1. Ordinary Portland Cement: | ACC, JK Birla, Vikram, Raymond, Ultratech, Star, Topcem, Lafarge conforming to IS for 43/ 53 grade as applicable for design and drawing. |
| 2. Reinforcement Steel MS & TMT: | M.S. bar shall conform to IS: 2062. TMT bar shall be as per IS: 1786 of grade Fe-415/ 500.
Approved manufacturer for MS/ TMT bar are SAIL/ TISCO/ ISPAT/ BISCON/ KAMDHENU or other reputed manufacturer with prior approval of the competent authority. |
| 3. PVC pipe for weep holes: | Parag, Jindal, Supreme, Prince. |

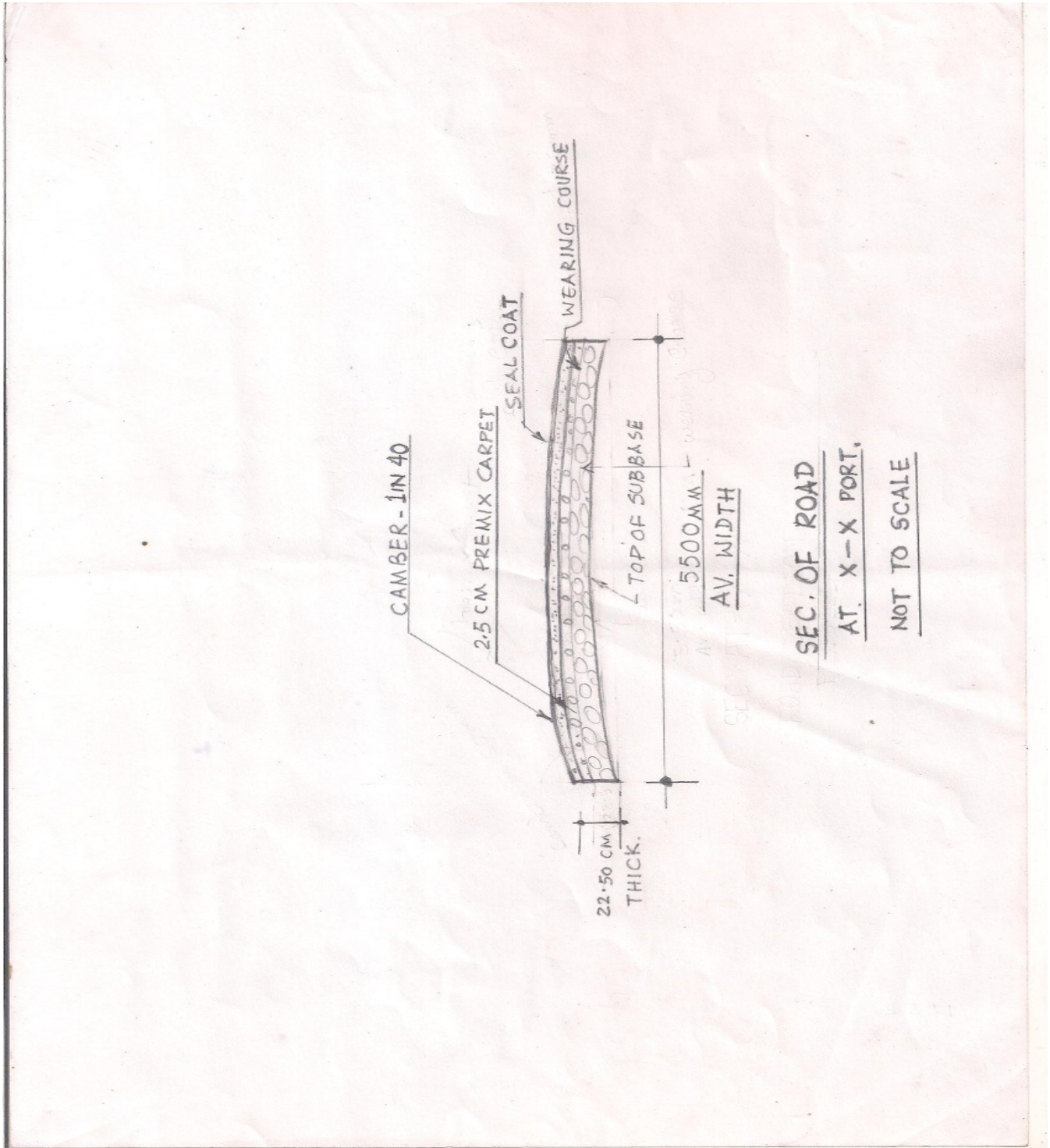
Note : The materials other than approved list shall also bear IS mark and/ or to be approved by the Engineer-in-charge before the use. Required tests are to be conducted by the contractor before use at works.



Tender for Road Work Within The Manicktala Factory Complex, All Around The Betalactum Block, East side of Cephalosporin Block & Road to repair the cable trenches made by CESE & Roads to Sub Station Area.

Annexure-II

Drawings:



Signature

