

TRANSMISSION CORPORATION OF TELANGANA LIMITED
NOTICE INVITING TENDERS

TENDER NOTICE No.SE/OMC/KNR/DE(T)/ADE(T)-1/F.No./D.No.462/24,Dt:11.03.2024.

1. The Superintending Engineer / OMC / TSTRANSCO / Karimnagar invites sealed tenders from the valid registered contractors of TSTRANSCO for the following work.

Tender specification No.	Name of the work	Approx value of the work including GST. (Rs.)	EMD to be paid (Rs.)	Cost of specification (Rs.)
S30/2023-24	Erection of 33KV Bay for extension of supply to Electric Vehicle charging station of TSRTC Karimnagar-II Depot at 132/33KV SS Water works in OMC Circle, Karimnagar.	Rs. 2,50,779/-	5,100/-	590/-

2. The bidder can obtain tender specification from the office of the undersigned
- Last date for receipt of requisition and : **08.04.2024 up to 12:00 PM**
Issue of tender specification.
- Last date for receipt of Tender Schedules : **08.04.2024 up to 3:00 PM**
Date of opening of Tender : **08.04.2024 @ 3:30 PM**
3. Bidder shall remit Rs.590/- if collected in person and Rs.690/- if it is to be sent through post/courier towards non-refundable cost of the tender Specification in the following manner.
- i) Through online payment to SBI A/C No.52106235959, IFSC Code SBIN0020134. (Proof of payment shall be submitted while purchasing tender specification and EMD).
- Or
- ii) Demand draft preferably drawn on SBI and payable at SBI, Main branch, Karimnagar. (Demand draft should not be folded).
4. Details can be had from the concerned at O/o Superintending Engineer/ OMC/ Karimnagar on all working days during office hours.
Contact: ADE (Tech): 9490154095.
5. The Superintending Engineer/OMC/Karimnagar reserves the right to reject any or all the tenders without assigning any reason and for selection of agency for awarding the work without assigning the procedure of selection and agency who quoted does not have any right for awarding the work based on precedents, procedures followed at other places etc.,
6. If any of the dates mentioned in the tender notification and specification happens to be holiday due to unforeseen reason, the same will be postponed to the next working day.
7. EMD is 2% on ECV.
8. This notice is available on TSTRANSCO website <https://www.tstransco.in>.

Sd/-
Superintending Engineer,
OMC, Karimnagar.

To
The Notice Board,
Copy submitted to
The Chief Engineer/Transmission/TSTRANSCO/VS/Hyderabad.
The Chief Engineer/Karimnagar Zone/TSTRANSCO/Karimnagar.

GENERAL TERMS & CONDITIONS

Name of the work:-

Erection of 33KV Bay for extension of supply to Electric Vehicle charging station of TSRTC Karimnagar-II Depot at 132/33KV SS Water works in OMC Circle, Karimnagar

1. ELIGIBILITY:

- a) Registration with TSTRANSCO/TSNPDCL/TSSPDCL for electrical/civil works.
- b) Turnover of the bidder for the year 2021-22 or 2022-23 shall not be less than the ECV.

2. **FIRM PRICE:** Price quoted shall be firm for the contract period. Price variations are applicable only for substation structures and earth flats.

3. PRICE VARIATION FOR SUBSTATION STRUCTURES AND EARTH FLATS:

Price Variation is applicable in respect of the Substation Structures and Earth flats as per the T.O.O CE (Construction-2) Ms.No.242 Dt: 08.11.2012.

- The price adjustment shall be applicable within original contract period or period extended on grounds of the departmental delays and valid reasons and shall not be applicable to the extension granted on account of the contractor's fault.
- Price adjustment shall be applicable for actual components of items of works actually carried out during the period of the bill. The price variation formulae is $PV = (\text{Final Rate} - \text{Basic Rate}) \times \text{Quantity}$.
- The adjustment scheme will be applied in all cases where the variation between the estimated rates and board of Chief Engineers approved rates (increase or decrease) is more than 5% for the month.
- In case variation is positive, the department will operate variation in rates only to the extent where it is above 5% over the estimated rates. Thus if the price excess is 10%, payment will be made only to the extent of 5% (10%-5%) since the contractor factors into his original bid his risk of absorbing the first 5% increase. The same shall be followed for -ve price variation.
- For the time extension due to departmental fault, both +ve and -ve price variations are applicable. For the time extension due to contractor's fault, only -ve price variation is applicable.
- The final rate of earth flat for the purpose of price variation shall be the rate communicated by the Chief Engineer/Transmission for every month as on 1 month prior to the date of check measurement.

Contractor

Sd/-
Superintending Engineer,
OMC, Karimnagar.

PRICE VARIATION CLAUSE for Reinforcement Steel & Cement:

Price Variation is applicable in respect of the items Cement, Reinforcement steel & Structural steel as per the T.O.O.CE(Civil) Ms.No.24 Dt: 25.04.2008, T.O.O (CE-Civil) MS No.84,Dt:12.06.2012 and T.O.O (CE-Civil) MS No.260,Dt:28.11.2012.

- The price adjustment shall be applicable with in original contract period or period extended on grounds of the departmental delays and valid reasons and shall not be applicable to the extension granted on account of the contractor's fault.
- Price adjustment shall be applicable for actual components of items of works actually carried out during the period of the bill. The price variation formulae is $PV = (\text{Final Rate} - \text{Basic Rate}) \times \text{Quantity}$.
- The adjustment scheme will be applied in all cases where the variation between the estimated rates and board of Chief Engineers approved rates (increase or decrease) is more than 5% for the month.
- For the time extension due to departmental fault, both +ve and -ve price variations are applicable. For the time extension due to Contractor's fault, only -ve variation is applicable.
- After approval of monthly steel & cement price adjustments by the concerned agreement concluded authority after scrutiny by SAO/A.O of the zone, the consolidated monthly or bimonthly or quarterly supplemental slip (as supplemental slip to original agreement) has to be submitted to the LOI issuing authority along with all relevant approved price adjustments for authorization for payment.

The basic rate of reinforcement steel and Cement taken in the estimate are of October-2023.

4. **VALIDITY OF BIDS:** The rates quoted shall be valid for 90 days from the date of opening of tender.

5. **EARNEST MONEY DEPOSIT:**

- i) Tender should be accompanied by an Earnest Money Deposit (EMD) equal to 2% of estimated value of the tender, i.e., Rs. 5,100/- (Rounded off to 100/-).
- ii) EMD should be in the form of a crossed demand draft drawn on the State Bank of India or any other Nationalized bank payable at Karimnagar in favour of the Superintending Engineer / OMC / TSTRANSCO / Karimnagar.

or

Online payment to SBI A/c No. 52106235959, IFSC code SBIN0020134
(Proof of payment shall be submitted while submitting the bid).

- iii) E.M.D. will be refunded to the unsuccessful bidders after finalization of tenders. For successful bidders, the EMD will be refunded after awarding the contract.

Sd/-

Contractor

Superintending Engineer,
OMC, Karimnagar.

iv) The E.M.D. will be forfeited in the following cases:

- a. When the successful bidder does not accept the order after issue of letter of intent / acceptance letter.
- b. When the successful bidder fails to furnish the security deposit within specified period after issue of letter of intent/acceptance letter.
- c. When tender is disqualified.
- d. When the bidder alters his prices or withdraws his offer during the validity period.

6. DOCUMENTS TO BE FURNISHED:

The Bidder shall enclose with the tender the copies of

- a. Registration with TSTRANSCO for electrical works.
- b. CA certificate for turnover for the year 2021-22 or 2022-23
- c. Certificates of Experience in similar nature of works.
- d. Proof of EMD paid.

7. **SECURITY DEPOSIT:** Contractor has to pay within 15 days from the date of issue of the LOI, equal to 5% of the total value of the contract as security deposit. The security deposit shall be paid in shape of Demand Draft drawn in favour of the Superintending Engineer/OMC circle / TSTRANSCO / Karimnagar payable at State Bank of India, Main branch, Karimnagar or online payment to SBI A/C No. 52106235959, IFSC code SBIN0020134. No interest will be paid on security deposit. The security deposit will be released after completion of guarantee period upon certification by the concerned field Engineer on satisfactory performance of the works.

8. **ADDITIONAL SECURITY DEPOSIT:** If the rate quoted by the bidder is less than 10% of ECV, additional security deposit (ASD) shall be paid for an amount equal to the less percentage below 10%. E.g, if the bidder quotes 15% below the ECV, then he has to pay ASD equivalent to 5% of the ECV. The Additional Security Deposit shall be paid in the form of DD in favour of the Superintending Engineer / OMC / TSTRANSCO / Karimnagar payable at SBI, Main Branch, Karimnagar or online payment to SBI A/C No. 52106235959, IFSC code SBIN0020134. The Additional Security Deposit will be released after completion of the work upon certification by the concerned field engineer.

9. REJECTION OF BID:

The bid is liable for rejection

- i) If proof of payment of EMD is not enclosed.
- ii) If the documents mentioned at point 6 are not enclosed.
- iii) The tender quoted more than 5% will be rejected.

10. EVALUATION CRITERIA:

- a. Where there is a discrepancy between the unit price and total price, the unit price will prevail and the total price will be corrected accordingly.
- b. Where there is a discrepancy between words and figures, the amount in words will prevail.
- c. Evaluation will be done based on the total price with applicable GST.
- d. Bidder who offers the lowest price on the estimate will be accepted.

Contractor

Sd/-
Superintending Engineer,
OMC, Karimnagar.

11. NEGOTIATIONS: Only L1 bidder will be called for negotiations.

12. PURCHASE ORDER/AGREEMENT:

- a. Successful bidder will be issued with contract award order after due payment of security deposit as mentioned at clause-6 and the successful bidder will then be called the service provider.
- b. The service provider shall acknowledge the purchase order/agreement.

13. PAYMENT TERMS:

- i) 95% Payment will be made based on the bills of the contractor after certification of work done by the officers in charge of the work and following all the rules in vogue.
 - ii) Balance 5% of payment will be made after completion of guarantee period upon certification by the concerned field Engineer on satisfactory performance of the works.
14. If the contractor has received any excess payment by mistake or if any amounts from the TSTRANSCO due to any other reason, when it is not possible to recover such amounts under the Contract recovering the same from any other amounts and Bank Guarantee given by the contractor due to or with the TSTRANSCO.
15. The work should be completed within 60 days from the date of handing over of site. The work should be carried out as per the schedule enclosed.

16. QUALITY:

Equipment/Materials supplied by you shall be of good quality. The Divisional Engineer / O&M / Karimnagar shall ensure the quality of the material before use.

17. TELANGANA GREEN FUND:

0.01% of the total value of the contract will be deducted and will be remitted to the concerned department.

18. PENALTY FOR DELAY IN SERVICE:

The time for and the dates for delivery mentioned in the contract will be deemed to be the essence of the contract. Subject to force majeure clause, if the Service Provider fails to deliver the services within the period(s) specified in the contract, the TSTRANSCO will, without prejudice to its other remedies under the contract, deduct from the contract price, as liquidated damages, a sum equivalent to 0.5% per week on the undelivered portion subject to a maximum of 5% of the total value of the contract. Once the maximum is reached the TSTRANSCO may consider termination of the contract.

For penalty, the number of days would be rounded off to the nearest week and penalty will be calculated accordingly. The penalty specified above will be levied and would be adjusted against subsequent pending bills.

Contractor

Sd/-
Superintending Engineer,
OMC, Karimnagar.

19. EXTENSION OF THE COMPLETION DATE: When a work cannot be completed within the completion period indicated for reasons beyond the control of the contractor i.e., due to Force Majeure Conditions mentioned below or due to the reasons attributable to TSTRANSCO, the Contractor shall represent for the same and extension of time without levying penalty shall be granted only on the issue of an undertaking by the contractor that they will not put forth at a later date any claims, for extra payments towards increased overheads, material/equipment/works costs etc., during the extended period. It is the sole discretion of the TSTRANSCO to grant extension of completion period. However, price variation is applicable as per the price variation clause of the purchase order.

20. DEVIATION CLAUSE: “The quantities indicated in the schedules are only provisional and are likely to change during actual execution. When quantities of any item are likely to exceed beyond 25% over and above the scheduled quantity or any new items/supplemental items arises, the contractor shall bring the fact to the notice of the Superintending Engineer/OMC/Karimnagar, three weeks in advance and take orders for going ahead with the work.

All such items of works shall, however, be executed only on the written directions of the concerned Divisional Engineer. The contractor shall execute all increased/supplemental/new items that are found essential, incidental and inevitable during execution of the contract at the rates to be worked out as below:

a) For the items covered in schedule:

For quantities increased over and above the scheduled quantities: The rates awarded in the contract are applicable for any increase in quantities of works.

b) For Supplemental / New Items:

- i) For the items where the rate can be deduced from the estimate or TSTRANSCO / DISCOMS / Common SSR, the rate applicable will be the estimated / SSR rate plus or minus (+/-) tender percentage accepted by the bidder for Schedule-B. The schedule of rates adopted for supplemental items/new items shall be from the current SSR applicable during the execution period.
- ii) For the items where the rates of new items cannot be deduced from the estimate / SSR, the rate payable will be arrived based on the prevailing market rates duly enquiring / collecting quotations and observing the reasonableness of the rates by the purchaser.”

21. GOODS AND SERVICES TAX (GST):

- a. GST No. of TSTRANSCO is 36 AAFCT0166J1Z9 and shall be quoted on their invoice.
- b. The GST Registration number of Supplier shall to be quoted on each invoice.
- c. Tax invoice shall contain SGST and CGST breakup (or IGST) along with HSN Code.
- d. Suppliers who have opted for composition scheme in GST shall not charge GST in their invoice. Supplier shall submit the Bill of supply without charging GST stating on the top of their Bill of Supply that “Composition taxable person, not eligible to collect tax on supplies”.

Contractor

Sd/-
Superintending Engineer,
OMC, Karimnagar.

- e. The input tax credit claimed by registered taxable person should commensurate reduction in the price of goods and services supplied to TSTRANSCO.
- f. GST TDS @ 2% will be recovered and remitted to Government (if applicable).
- g. E-mail address shall be mentioned on the invoice to send TDS certificate.
- h. e-Invoice shall be furnished whose aggregate turnover exceeds Rs.5.00 crores in a financial year.
- i. In case turnover is less than Rs.5.00 crores, a declaration shall be furnished by the supplier / vendor regarding their turnover.
- j. A copy of GST payment challan and proof of filling GST return by the supplier / vendor shall be furnished

22. Applicable labour cess @1% will be deducted from the bills.

23. **STATUTORY VARIATION:** Any variation in taxes up or down will be to the account of TSTRANSCO.

24. **GUARANTEE:** The contractor should stand guarantee for the workmanship for a period of 12 months from the date of completion of work i.e from the date of check measurement.

25. If any accident occurs to the contractor or to his labour during the course of work or outside, the Contractor only will be held responsible and for any compensation to be paid, the contractor has to pay. The TSTRANSCO is not responsible and if the contractor does not pay such Compensation as settled by the courts or labour departments, the TSTRANSCO will recover such amount from any of the bills of the contracts held with TSTRANSCO.

26. The contractor should provide all statutory requirement and facilities to the workers engaged at his own cost.

27. The work under execution shall be done under the supervision of Contractor's supervisor, as per the instructions of TSTRANSCO Engineer in charge.

28. The contractor should arrange accommodation and boarding to the workers engaged by him for the work, at his own cost nearer to the work spot.

29. For any reason if the work is delayed, stopped, interrupted or trying to postpone the work without any reasonable cause to the satisfaction of TSTRANSCO Engineers, the loss sustained by the TSTRANSCO due to above inconvenience shall be paid by the contractor.

30. Every care should be taken by the Contractor for his labour while doing the work so as to not to damage the TSTRANSCO equipment, properties, T&P, etc. In case of any damage, the contractor is responsible and shall pay the damages sustained.

Contractor

Sd/-
Superintending Engineer,
OMC, Karimnagar.

31. The contractor shall comply with all state and central laws, statutory rules, regulations etc., such as payment of wages act, minimum wages act, workmen compensation act, employees liabilities act, industrial disputes act etc., and EPF scheme and other acts as directed by Government during the tenure of contract period.
32. What so ever may be reason, no extra payment will be made by TSTRANSCO other than the agreed rates at a later date.
33. Medical facilities for the labour engaged by the contractor should be arranged at his own cost.
34. The contractor's personnel should follow all the rules in vogue at site.
35. In case, the work carried out is not satisfactory to the Engineer of TSTRANSCO, the Superintending Engineer / OMC / TSTRANSCO / Karimnagar reserves the right to terminate the contract with 7 days notice and get the balance work done by other agencies and recover the cost if any from the amounts of the bidder available with TSTRANSCO.
36. No part of the contract shall be sublet without written permission of Superintending Engineer / OMC / TSTRANSCO / Karimnagar nor shall be transferred power of attorney / authorizing others to receive payments on contractor's behalf.
37. TSTRANSCO has right to cancel the work at any stage without assigning any reason.

38. FORCE MAJEURE:

- a. The contractor will not be liable for penalty for delay in work or termination for default if and to the extent that its delay is the result of an event of Force Majeure.
- b. For purpose of this clause, "Force Majeure" means an event beyond the control of the supplier and not involving the contractor's fault or negligence and not foreseeable. Such events may include, but are not restricted to, wars or revolutions, fires, floods, epidemics, quarantine restrictions, lockdowns and freight embargoes.
- c. If a Force Majeure situation arises, within 15 days from the date of eventuality, the contractor shall notify TSTRANSCO in writing of such condition and the cause thereof. Unless otherwise directed by the TSTRANSCO in writing, the contractor shall continue to perform their obligations under the contract as far as it is reasonably practice, and will seek all reasonable alternative means for performance not prevented by the Force Majeure event.

Contractor

Sd/-
Superintending Engineer,
OMC, Karimnagar.

39. **JURISDICTION:** All and any disputes or differences arising out of or touching this contract will be decided by the Courts situated at Karimnagar in Telangana State.

40. **GENERAL:**

- i) Bidder shall sign on all the pages of the specification as a token of acceptance of all the terms and conditions of the specification.
- ii) Bidders shall furnish the declaration in the prescribed format (enclosed) regarding relationship with Transco employees. If false information is furnished in the declaration regarding “Relationship with Transco employees”, it will render the contract liable for termination as well as recovery of damages.
- iii) In case of ambiguity, discrepancy with respect to tender conditions and situations which are not covered in tender specification, SE/OMC/Karimnagar is the final authority for taking decision and no correspondence will be entertained in this matter and the decision taken cannot be questioned.
- iv) The Superintending Engineer/OMC/Karimnagar reserves the right to reject any or all the tenders without assigning any reason.
- v) The Superintending Engineer/OMC/Karimnagar reserves the right to cancel the tender process at any stage if required and bidders shall not have right to ask for reasons.

41. Any further information regarding tender, specification and schedule can be had from the Office of Superintending Engineer / OMC / TSTRANSCO / Karimnagar.

Contact person: ADE (Tech): **9490154095**

Sd/-
Superintending Engineer
OMC, Karimnagar.

To
The Notice Board.

Copy submitted to
The Chief Engineer / Karimnagar Zone / TSTRANSCO / Karimnagar

Erection of 33KV Bay for extension of supply to Electric Vehicle charging station of TSRTC Karimnagar-II
Depot at 132/33KV SS Water works in OMC Circle, Karimnagar

Material data

Sl No	Material Description	Qty	Rate/unit	Amount
1	TWIN MOOSE TO SINGLE MOOSE SPACER T CLMP (150MM)	3.000	714.82	2144.46
2	MECHANICAL FOAM FIRE EXTINGR-9 LT	1.000	2,311.11	2311.11
3	GI EARTH BONDS	18.000	222.48	4004.64
4	EARTH DISCHARGE ROD 4.5MTR L MADE OUT OF 32MM DIA PVC PIPE 3MM THICKNESS, CLAMP OF SIZE 6X30X300MM MADE COPPER FIXED TO EARTH ROD	3.000	1,526.00	4578.00
5	33KV CT STUD CLAMPS (MOOSE)	6.000	450.00	2700.00
6	PAD CLAMP FOR MOOSE 100X100X15MM	15.000	750.00	11250.00
7	PAD CLAMP FOR DOG 75X75X12MM	3.000	233.24	699.72
8	RUBBER MAT OF SIZE 1 MTR X2 MTR X 12 MM THICK SHOCK PROOF	2.000	1,059.30	2118.60
9	100 X 16 MM GI EARTH FLAT	4.000	1,072.50	4290.00
10	90W LED STREET LIGHT WITH FIXTURE	2.000	2,796.61	5593.22
Total Material cost				39689.75

Labour portion

S.No	Description of the work	Qty	Rate/unit	Amount
ELECTRICAL PORTION				
1/2	Erection Of The Following Equipment With Crane / Derrick At SiteIncluding Handling The Material / Equipment Carefully At Site IncludingLabour Charges For All Incidental And Operational Items Of Work.(excluding Cost Of Transport Charges From Dept. Stores To The Site). 33Kv Isolators Including Solid Core Insulators Erection, Alignment In FullShape For Smooth Operation. (Erection Of 33kv Line Isolator Including Solid Core Insulators)	1.000	2,374.00	2374.00
1/3	Erection Of The Following Equipment With Crane / Derrick At SiteIncluding Handling The Material / Equipment Carefully At Site IncludingLabour Charges For All Incidental And Operational Items Of Work.(excluding Cost Of Transport Charges From Dept. Stores To The Site). 33Kv Isolators Including Solid Core Insulators Erection, Alignment In FullShape For Smooth Operation. (Erection Of 33kv Bus Isolator Including Solid Core Insulators) Break-up for Rs. 4,748.00 / Base Price Rs : 2,374.00) A)Works under SD (ZB04) - 100.00 % : Rs . 2,374.00	1.000	4,748.00	4748.00
1/4	Setting Of Stubs With Stub Setting Template For Sub-stationStructure:erection Of Stub Template, Fixing Of Jacks For Supporting TheTemplate, Alignment And Leveling Of Exact Location Of Stubs OfStubsetting Template, Dismantling Of Template After Completion Of Initial Curing Of Cc 33 Kv Breaker	1.000	1,530.00	1530.00
1/5	Erection Of The Following Equipment With Crane / Derrick At SiteIncluding Handling The Material / Equipment Carefully At Site IncludingLabour Charges For All Incidental And Operational Items Of Work.(excluding Cost Of Transport Charges From Dept. Stores To The Site). 33Kv Circuit Breakers Including Ploe To Pole Cable Wiring AndTerminations.	1.000	7,360.00	7360.00
1/6	Erection Of The Following Equipment With Crane / Derrick At SiteIncluding Handling The Material / Equipment Carefully At Site IncludingLabour Charges For All Incidental And Operational Items Of Work.(excluding Cost Of Transport Charges From Dept. Stores To The Site). 33Kv Current Transformers.	3.000	1,149.00	3447.00
1/7	Erection Of The Following Equipment With Crane / Derrick At SiteIncluding Handling The Material / Equipment Carefully At Site IncludingLabour Charges For All Incidental And Operational Items Of Work.(excluding Cost Of Transport Charges From Dept. Stores To The Site). 33Kv Lightning Arrestors.	3.000	686.00	2058.00

Sl No	Material Description	Qty	Rate/unit	Amount
1/8	Excavation Of Earth Pit, Putting Cast Iron Pipe With Flange On One End(as Per Iss7181/86) Of Nominal Dia 125mm And 2.75 Meters Long In SideThe Pit Including Supply And Fixing Rcc Collars 0.75 Meter Dia (od),50mm Thick And 0.60meters Long In Side The Pit, Backfill The Pit In The25mm Size Granules Of Bhcoke For Full Depth Of The Pit With AlternateLayers Of Bh Coke And Salt Of 300mm Thick Around The Earth Pipe Of 150mmOn All The Sides Of The Pipe Including Cost And Conveyance Of Bh Coke,Salt, Clamps, C.i.pipes And Rcc Collars, Labour Charges For AllOperational And Incidental Items Of Work Etc., Complete. 220 And 132kv	2.000	15,077.00	30154.00
1/9	Erection Of Control / Relay Panels, Ltac Panels, Announciation, PtdbPanels Etc.,in The Control Room Duly Mounting Them On Channels AndGrouting Them With Foundation Bolts Excluding Cost Of Channels AndFoundation Bolts (for 220kv And 132kv), Including Man Power SupportTomrt Wing For Commissioning. 220 And 132kv .	1.000	3,245.00	3245.00
1/10	Connection Of Equipment To Bus And Or Another Equipment With SingleZebra/moose/panther Conductor Including Measuring, Cutting,clamping AndHoisting Of Suspension Insulator Assembly To Support The ConductorWherever Necessary. 220 And 132kv Break-up for Rs. 708.00 / Base Price Rs : 354.00) A)Works under SD (ZB04) - 100.00 % : Rs . 354.00	6.000	708.00	4248.00
1/11	Connection Of Equipment To Bus And Or Another Equipment With SingleZebra/moose/panther Conductor Including Measuring, Cutting,clamping AndHoisting Of Suspension Insulator Assembly To Support The ConductorWherever Necessary. 220 And 132kv	9.000	354.00	3186.00
1/12	Laying Of Control Cables Of All Sizes (from 2 Core. 1.5/2.5 / 4.0 Sq.Mm. To 20 Core, 1.5/2.5/4.0sqmm , Both Copper And Alluminium In CableTrenches Including Cost Of Suitable Metalic Cable Glands With RubberLining. Note: This Includes Running Of Cables In Control Room WhereCables Are Run On Cable Racks In Cable Duct.	570.000	13.00	7410.00
1/13	Cable Terminations To The Switchgear, Marshalling Boxes / Panel TerminalBlocks/control And Relay Panels, Ltac Panel Including Providng SuitableFerrules And Lugs As Per Specification (including Cost Of Ferrules AndLugs) (for 220kv And 132kv). 220 And 132kv 1.5/2.5 Sq.mm. Copper WithCopper Lugs Each Core At Both Ends..	38.000	39.00	1482.00
1/14	Erection Of Marshalling Boxes 220 And 132kv	1.000	530.00	530.00
1/15	Writing Letters In Control Room Panels, Lettering On Panels,Marshalling Boxes Etc....	6.000	110.00	660.00
1/18	Laying Of Earth Mat Including Excavation Of Trenches, Welding,Connecting To Equipment And Connecting Lightning Shield To Earth Mat AndEarthing Of Fence Posts, Drilling And Connecting Earth Rods IncludingConnecting Cast Iron Pipes As Per Drg. No.set(p)/149/82 With TheFollowing Sizes Of Ms Flats / Gi Flats.(for 220kv And 132kv) IncludingFabrication. 220 And 132kv 100x16mm Ms Flat / Gi Flat.	4.000	113.00	452.00
1/20	Transportation Of Material/ Equipment	2.000	13,247.01	26494.02
1/21	Loading / Unloading Of Loading / Unloading Of 220 And 132kv 33 KvIsolators (without Soild Core Insulators) (Loading And Unloading Of 33kv Bus And Line Isolators)	2.000	320.74	641.48
1/22	Loading / Unloading Of Loading / Unloading Of 220 And 132kv 33kv SolidCore Insulators (Loading And Unloading Of Solid Core Insulators)	18.000	9.10	163.80
1/23	Cases Containing Cts, Pts, Cvts 11kv To 33kv Rating (Loading And Unloading Of 33kv Cts)	3.000	194.44	583.32
1/24	Cases Containing Las 33kv (Loading And Unloading Of 33kv Las)	3.000	40.84	122.52
1/25	Loading / Unloading Of Loading / Unloading Of 220 And 132kv 33kv Breaker (Loading And Unloading Of 33kv Cb)	1.000	1,930.36	1930.36

Sl No	Material Description	Qty	Rate/unit	Amount
1/26	Cases Containing Control And Relay Panels 33kv (Loading And Unloading Of 33kv Twin Feeder Panel)	1.000	644.24	644.24
1/29	Loading /unloading Of Rs Joists And Rail Poles And Ms Sheets Pf Various Sizes. 220 And 132kv (Loading And Unloading Of 100x16mm Gi Flat)	0.050	441.34	22.07
1/30	Loading /unloading Of Moose Acsr 220 And 132kv (Loading And Unloading Of Acsr Conductor)	0.040	679.56	27.18
1/31	Loading / Unloading Of Control Cables Up To 6 Core 220 & 132kv (Loading And Unloading Of Control Cables Up To 6 Core)	0.470	291.12	136.83
1/32	Loading / Unloading Of Control Cables Above 6 Core 220 & 132kv (Loading And Unloading Of Above 6 Core)	0.100	388.24	38.82

Total Electrical Labour portion

103688.64

CIVIL PORTION

2/1	Earthwork Excavation In All Types Of Soils (upto Stone Matrix) Which Can Be Excavated In Combination Of Mechanically And Manually With Pick Axe And Crow Bars And Do Not Require Blasting In All Conditions Such As Dry, Wet, Slushy Etc., Covering Initial Lead And Lift Etc., And Backfilling The Foundations (after Laying Foundations) With Excavated Earth Including Watering, Compacting As Per Standard Specification And Disposing Of Surplus Earth Within Site (up To 1km Lead) Complete As Per Directions Of Engineer In Charge At Site For Finished Item Of Work.	7.000	285.87	2001.09
2/2	Providing Sand Filling Below The Foundations As Per The Standard Specifications Of Apdss In Uniform Horizontal Layers Including Cost And Conveyance Of All Materials, watering And Ramming, tools & Tackles, all Labour Charges, all Leads & Lifts Etc., Complete For Finished Item Of Work As Per The Directions Of The Engineer-in-charge. (Apss No. 309&310)	1.700	1,281.54	2178.62
2/3	Laying Of Cement Concrete (1:4:8) Mix Using 40mm Size Hbg Metal Machine Crushed For Foundations Including Cost And Conveyance Of All Materials At All Leads And Lifts, Ramming, Consolidating, Curing Etc., complete. For Finished Item Of Work As Per Directions Of The Engineer-in-charge.	0.400	4,649.35	1859.74
2/4	Laying Of Plain Cement Concrete (pcc) - Nominal Mix (1:3:6) With 12 To 20mm Hbg Metal Over Rr Wall With Necessary Form Work Including Cost And Conveyance Of All Materials, Labour Charges, Curing And Water Charges, Tools And Tackles, All Leads & Lifts Etc., Complete For Finished Item Of Work As Per Directions Of The Engineer-in-charge. (is-456)	0.200	5,833.33	1166.67
2/5	Providing High Yield Strength Deformed (hysd)/ Thermo Mechanically Treated (tmt) (fe500/ 500d/ 550d) Grade As Per Is 1786-1979) Of Tisco/ Sail/ Vsp/jindal Make, Different Diameters For Rcc Works , Including Labour Charges For Straightening, Cutting, Bending To Required Sizes And Shapes, Placing In Position With Cover Blocks Of Approved Materials And Size And Tying And Lap-splicing With Binding Wire Of 18Swg, Forming Grills For Reinforcement Work As Per Approved Designs And Drawings, Including Cost And Conveyance Of Steel Bars, Including All Wastages Such As Overlaps, Couplings, Chairs, Spacer Bars Including Cost And Conveyance Of Binding Wire, Cover Blocks And All incidental, Operational, Labour Charges Such As Cutting, Bending, Placing In Position, Tying Including Other Taxes On All Materials Etc., Complete For Finished Item Of Work In All Floors As Per The Directions Of The Engineer-in-charge. (Apss No.126) - Switchyard Works And Line Works	0.100	77,799.62	7779.96

Sl No	Material Description	Qty	Rate/unit	Amount
2/6	Rcc M- 20 Nominal Mix (cement 400 Kgs) Using 20mm Size Graded Machine Crushed Hard Granite Metal (coarse Aggregate) (20mm & 12mm (2:1)) From Approved Quarry Including Cost And Conveyance Of All Materials Like Cement, Fine Aggregate, Coarse Aggregate, Water Etc., To Site And Including All Operational, Incidental And Labour Charges Such As Machine Mixing, Laying Concrete, Curing And Steel Centering, Etc., complete But Excluding Cost Of Steel And Its Fabrication Charges For Finished Item Of Work (sand 0.45 Cum And Metal 0.90 Cum) As Directed By The Engineer In Charge For Finished Item Of Work. - Switchyard Foundation	2.700	10,407.91	28101.36
2/7	Back Filling The Foundation And Basement With Borrowed Gravel As Per Requirement And Specification Including Cost & Conveyance Of All Materials, Labour Charges, Leads, Lifts , Watering And Consolidating To Required Density Complete As Per The Directions Of The Engineer In Charge For The Finished Item Of The Work . (Apss No.309&310)	1.800	419.87	755.77
2/8	Construction Of Rr Masonry With Cm (1:6) Using Hard Crs, Rough Granite Stone And Bond Stones (0.16 Cum) Including Cost And Conveyance Of All Materials, Labour Charges, Water Lead , Curing, All Leads And Lifts Etc., Complete For Finished Item Of Work As Per Directions Of The Engineer-in-charge.	1.000	4,409.66	4409.66
2/9	Construction Of Brick Masonry In Cm (1:6) With Fly Ash Cement/ Lime Solid Blocks With Compressive Strength Of 50 Kg/ Sq.cm Confirming To Is:12894-1990 Class 5 Of Size 225 X100 X 60 Mm Of Approved Quality, Including Cost & Conveyance Of All Materials, Labour Charges, Scaffolding Leads, Lifts And Curing Complete As Per The Directions Of The Engineer In Charge For The Finished Item Of Work . - Without Scaffolding	1.000	8,462.61	8462.61
2/10	Plastering With Cm (1:5), 12 Mm Thick To The Even Wall Surfaces With Sponze Finishing Including Cost & Conveyance Of All Materials, Labour Charges, Leads, Lifts , Scaffolding And Curing Complete As Per The Directions Of The Engineer In Charge For The Finished Item Of Work. - Without Scaffolding	13.000	175.07	2275.91
2/12	Labour Charges For Picking Old Metal In The Existing Switch Yard Area 50 To 100mm Thickness Grading And Stacking The Useful 20mm Graded Metal For Re-using Including Cost And conveyance Of All Materials Labour Charges, Head Load Lead Upto 100mts And Initial Lift Etc., Complete For Finished Item Of Work As Directed By The Engineer-in-charge At Site.	5.000	278.85	1394.25
2/13	Supply And Spreading Of Crusher Dust In The Switch Yard Area (100mm Thick) In Two Layers Of 50mm Each Including Suitable Antiweed Treatment After Completion Of Final Levelling And Grading Including Disposal Of Surplus Earth And Filling Within Switch Yard Area Including Cost Of All Materials, Head Load Lead Upto 100 Mts And Initial Lift Etc., Labour Charges Complete As Per The Directions Of The Engineer In Charge For The Finished Item Of Work. (live Ss Work)	2.000	1,311.86	2623.72
2/14	Supply And Laying Of 180 Gsm Ldpe Sheet Of Approved Make In The Switch Yard Including Laying The Sheet Neatly In Between Layers Of Crusher Dust Without Folds To Avoid The Vegetation And Weed Growth, Cutting And Jointing The Sheet Properly Including Cost & Conveyance Of All Materials, All Leads , Labour Charges For Laying Complete As Per The Directions Of The Engineer In Charge For The Finished Item Of Work.	25.000	20.00	500.00
2/15	Spreading The Useful 20mm Graded Metal Available From The Stacks Picked From Existing Switchyard Area To 100mm Thickness As Directed After Doing The Micro Levelling And Providing Suitable Pcc Gauge Block Of Size 100x100x100mm At 2m X2m Intervals , Cost & Conveyance Of All Materials, Labour Charges, Head Load Lead Upto 100mts And Initial Lift Etc. Complete As Per The Directions Of The Engineer In Charge For The Finished Item Of Work.	2.000	300.85	601.70

Sl No	Material Description	Qty	Rate/unit	Amount
2/16	White Washing With Birla/jk White Cement Of Approved Quality With TwoCoats To Give Even Shade After Thoroughly Brushing The Surface To RemoveAll Dirt And Remains Of Loose Powdered Material Including Cost Of AllMaterials, Labour Charges And Incidental Charges Such As Scaffolding ,Lift Etc, Complete For Finished Item Of Work As Directed By TheEngineer In Charge. - Ground Level (upto 3.66m Height)	13.000	49.44	642.72
2/17	Supplying And Fixing 22.2 Mm Od Cpvc Pipes Of Sdr 13.50 Pipesof PremiumMake Supreme/ Prince/ Astral/ Birla Aerocon Including The Cost Of Pipe,Required Number Of Connectors Such As Elbows, Tees, Couplers,Connectors, Solvent Cement Etc., And Labour Charges Complete IncludingCost And Conveyance Of All Materials To Site, All Operational,Incidental , Labour Charges, Etc. Complete For Finished Item Of Work AsDirected By Engineer-in-charge.	5.000	366.03	1830.15
2/18	Supplying And Fixing 15.9 Mm Od Cpvc Pipes Of Sdr 13.50 Pipes Of PremiumMake Supreme/ Prince/ Astral/ Birla Aerocon Including The Cost Of Pipe,Required Number Of Connectors Such As Elbows, Tees, Couplers,Connectors, Solvent Cement Etc., And Labour Charges Complete IncludingCost And Conveyance Of All Materials To Site, All Operational,Incidental , Labour Charges, Etc. Complete For Finished Item Of Work AsDirected By Engineer-in-charge.	5.000	283.32	1416.60
2/19	Supply & Fixing Of 15 Mm Brass Body Cp Finish Bib Tap Of Not LessThan 300 Grams Weight Screw Type (full Turn) With Internal / ExternalThreaded Connection Conforming To Is 8931 (jaquar/ Cera/ H & RJohnson Make) Including Cost & Conveyance Of All Materials,Labour Charges, Leads, Lifts Complete As Per The Directions Of TheEngineer In Charge For The Finished Item Of Work .	1.000	321.60	321.60
2/20	Seigniorage Charges Including Smet	824.000	1.00	824.00
Total Civil Labour portion				69146.12
Total Estimate Value				212524.51
GST@18%				38254.41
Total Estimate Contract value				250778.92
Or say in Rupees				250779.00

TECHNICAL SPECIFICATIONS

1.0 SCOPE:

This Specification provides for collection of the materials supplied by TSTRANSCO from TSTRANSCO's stores, procurement and supply of balance materials to complete the work, transport of all materials to site, connecting jumpers etc. The contractor shall execute the works to the extent required to complete the work as a whole.

2.0 WORKS INVOLVED:

Electrical:

- 2.1. Loading, Transportation and Unloading of equipment
- 2.2. Erection of towers, structures and equipment
- 2.3. Connection of jumpers

Civil:

- 2.4. Jungle clearance
- 2.5. Excavation of soil
- 2.6. Foundation for equipments, structures and towers
- 2.7. Metal spreading
- 2.8. Cable trench and fire protection wall construction

3.0 MATERIALS TO BE SUPPLIED BY TSTRANSCO:

The contractor shall be fully responsible for the proper handling, maintenance and safe custody of the materials given to him or his authorized representative at TSTRANSCO stores for erection from the time of taking over till the complete sub-it is taken over by TSTRANSCO.

4.0 SURPLUS MATERIALS

On completion of works all materials left surplus from those supplied by TSTRANSCO under the contract for erection shall be handed over to TSTRANSCO as specified by the Engineer in charge.

5.0 REPLACEMENT:

In the event of the material handed over to the contractor for the execution of this contract being lost, damaged or destroyed while being in the custody of the contractor before being taken over by TSTRANSCO, the contractor shall be liable to make good the loss. In case the contractor fails to return the balance surplus materials, the cost of materials will be recovered from the contractor's bills.

6.0 MATERIALS REQUIRED FOR THE WORK:

The requisite quantities of materials specified in the List of Equipment/Material to be supplied by TSTRANSCO, required for the completion of work will be handed over to contractor at the TSTRANSCO's stores indicated progressively based on the program of the contractor and the actual progress obtained.

The contractor will be responsible for proper handling and maintenance of the materials from the time of receipt by him up to the time of handing over of the completed works to TSTRANSCO and return of surplus material, if any, at TSTRANSCO's stores. The cost of such handling and storage shall be covered in the quoted prices detailed in bill of quantities.

7.0 CLEARING UP THE SITE :

During the work, the contractor shall keep the work site and storage area used by him free from accumulation of waste materials or rubbish and before completing the works the contractor shall, at his own cost, remove or dispose in a manner satisfactory to the Engineer in charge.

All temporary structures, waste and debris shall be cleaned, all holes in the ground shall be filled in and the land restored to its original state as far as is practicable and the entire premises should be in a neat and tidy condition of cleanliness as the Engineer in charge may direct. Any damage done to the permanent or temporary works of TSTRANSCO by the contractor shall be made good at contractor's expenses.

8.0 SITE STORES:

The successful bidder shall establish a temporary stores at his cost at the substation site for storing cement, equipment etc. These stores should be dismantled and site cleared after the work is completed by him.

9.0 SITE CONDITIONS:

The bidder is expected to familiarize with the site conditions and facilities available before quoting.

10.0 MATERIAL & QUALITY: All the materials used in the works shall be of the best quality of their respective kinds and specified herein. They shall be obtained from sources and suppliers approved by the Engineer in charge and shall comply strictly with the tests, specified hereinafter or, where tests are not specified in this specification they should conform to the requirements of the latest issue of the relevant Indian Standards hereinafter abbreviated to as (I.S.) or other approved National Standards authorized by the Engineer.

11.0 INSPECTION AND TESTING: All the materials used in the works shall be subject to inspection and tests if required by the Engineer in charge. Unless otherwise stated, the cost of all tests required by this specification shall be deemed to be included in the rates and prices named by the contractor in the bill of quantities. Any material which is prepared or manufactured without notice having been given in writing to the Engineer in charge may be rejected if the Engineer in charge considered that his inspection was necessary during the progress of manufacture of such material.

12.0 APPROVAL: No material shall be used in the works unless they have first been approved by the Engineer in charge.

13.0 EXCAVATION:

These shall be as per drawing for structure foundations and as per the Technical specifications for excavation, CC/RCC, Back filling etc. The scope of work is detailed here under.

13.1. EXCAVATION:

Earth excavation has to be done in all types of soils which can be excavated with pick axe & crow bars in all conditions such as dry, wet, slushy etc., and in hard rock requiring blasting including shoring, shuttering and dewatering wherever necessary covering initial lead and one extra lift.

13.2. FOUNDATION CONCRETE :

Laying foundation including dewatering the pits before and during the process of laying concrete in the proportion of CC 1:4:8 using 20mm HBG metal and RCC 1:2:4 using 12 to 20mm HBG metal as per the drawings for structural foundations and curing including cost of cement, reinforcement steel. Rate quoted shall be inclusive of template setting.

13.3. BACK FILLING :

Back filling of foundations with excavated soils including watering and consolidating in 150mm layers for normal soils. Providing sand cushion for foundations including cost of sand, watering and consolidation complete for BC soils upto 98% proctor density.

13.4. MASONARY :

Random rubble or uncoarsed rubble masonry with hard stone in cement mortar 1:6 for foundations upto ground level including cost and conveyance of all materials all leads and lifts and curing etc., complete for finished work and including cost of cement.

Coarsed rubble stone masonry 2nd sort with hard stone in cement mortar 1:6 for basement and wall above G.L., masonry work above G L including cost and conveyance of all materials ,all leads and lifts and curing etc., complete for finished item of work. The rate includes dewatering, shoring and shuttering required if any and including cost of cement. The relevant APSS clauses 601, 602 & 615 are applicable to this work.

14.0 TECHNICAL SPECIFICATION FOR COMMON BUILDING MATERIALS:

The aggregates such as sand metal shall be obtained from the source as indicated in lead statements.

- 14.1. **INDIAN STANDARDS:** The aggregates both fine and coarse shall comply with the requirements of I.S.456 for concrete and I.S.383 for sand for use in rendering, plastering and mortar except as hereinafter stated and shall be delivered to and maintained at the site, clean, washed and free from dirt.
- 14.2. **SAMPLES:** Samples shall be submitted to the Engineer and all aggregates used in the work shall be atleast equal to the approved samples.
- 14.3. **FINE AGGREGATE:** The fine aggregate for concrete, shall consist of naturally occurring and graded in accordance with the requirements of IS.383 for grading Zone-2 or grading Zone-3 except that no particle shall exceed 3/16 inch. It shall be free from excessive sharpness. Fine aggregate cement mortar and lime mortar and rendering plastering shall comply with IS 383.
- 14.4. **COARSE AGGREGATE:** Coarse aggregate shall be graded to produce sound concrete and for reinforced concrete shall be such that at least 5% by weight will pass a mesh of a size 1/4 per inch less than the minimum lateral distance between the reinforcing bars or 1/4 inch less than the minimum cover, whichever is smaller.
- 14.5. **WATER FOR CONCRETE:** Clean fresh water shall be used for mixing concrete grout and mortar and curing. The water used for mixing and curing shall be free from deleterious matter and acids and alkaline substances in a solution or suspension. Potable water shall generally be used for mixing and curing concrete.
- 14.6. **WATER FOR DRINKING:** All potable water shall be free from deleterious matter and shall be equal to or better than the minimum standard acceptable to the local and state authorities. Filtration and chlorination by approved means shall be installed as necessary to obtain the required standard. Storage and distribution of potable water shall be such as to prevent contamination.
- 14.7. **CEMENT:** Ordinary Portland cement of Grade 43/53 manufactured as per IS 8112 of 1989 shall only be used. Storage, certification, delivery and testing of the cement shall conform to IS:269, IS:8112 or the latest issue. IS certification mark is obligatory.

Cement procured from major cement manufacturing plants such as M/s Raasi, M/s Vishnu, M/s Andhra cement co., ACC, CCI, M/s L&T and Coramandel, Priyadarshini, Madras Cements etc will only be accepted for which prior approval shall be obtained from the employer. Copies of invoices and test certificates from the cement manufacturers shall be submitted by the contractor to the Engineer and his clearance obtained before actual use. Such clearance will be provided within a maximum period of one week.

- 14.8. **REINFORCEMENT:** Steel required for reinforcement will be procured by the contractor. The contractor shall work out the requirement immediately after taking over the site and receipt of working drawings and take the approval of the site Engineer and arrange for procurement.

15.0 TECHNICAL SPECIFICATION FOR EXCAVATION:

- 15.1. This clause covers excavation to be done for all the civil works. Sides and bottoms of excavation shall be vertically true.
- 15.2. Blasting material for excavation in Hard rock required if any has to be procured by bidder himself. Necessary assistance in the form of approval for procurement of the material will be given by the Board to the extent possible. All rules under explosive act shall be followed by the successful Bidder. Blasting work shall be done only after approval by the site engineer during specified hours. The person in charge of blasting shall satisfy himself that all blasts have exploded before working people are permitted to work site. Withdrawal of unexploded charge will not be permitted under any circumstances. Unexploded charge shall be flooded with water and the hole marked in a distinguished manner. Another hole shall be drilled at a distance of about 450 mm of old hole in the direction of unexploded charge and fired in usual way. This process shall be continued till the original blast is exploded. Excavation in decomposed or soft rock shall be carried out by crow bars or pickaxes or pneumatic drills etc. If he desires to do blasting, he shall obtain permission of Engineer in charge and do accordingly. The rock obtained during excavation is the TSTRANSCO's property and it shall not be used under any circumstances by the contractor. Rock excavated shall be stacked by the contractor at convenient place within the Substation's switchyard as directed by the Engineer in charge at no extra cost.

16.0 TECHNICAL SPECIFICATION FOR BACK FILLING :

After completion of foundation, footings and walls and other construction below the elevation of the final grades and prior to back filling, all forms of temporary shoring, timber, etc., shall be removed and the excavation cleaned of all trash, debris and perishable materials. Back filling shall begin only with the approval of the Engineer in charge. Back filling shall be done with inorganic materials obtained from the excavation of borrow pits, if suitable, and subject to the approval of the Board's Engineer in charge. Back fill shall not be dropped directly upon or against any structure or facility where there is danger of displacement or damage. Backfill shall be placed in horizontal layers not to exceed 15 cm. in thickness. Each layer shall be compacted with proper moisture content and with such equipment as may be required to obtain a density equal to or greater than 98% of maximum as determined by the relevant Indian Standards. Trucks or heavy equipment for depositing or compacting back-fill shall not be used within 1.5m of the foundation/structures, or other facilities which may be damaged by their weight or operation. The methods of compaction shall be subject to approval of the Engineer in charge. Backfill adjacent to pipes shall be hand placed free of stones, concrete, etc., compacted uniformly on both sides of the pipe and where practicable, to a depth of 300 mm over the top of pipes, when tamping around piping care should be taken to avoid unequal pressures.

17.0 TECHNICAL SPECIFICATION FOR CEMENT CONCRETE:

- 17.1. **CODE OF PRACTICE:** Except where otherwise specified, described or directed all concrete and reinforced concrete work shall be carried out in accordance with Indian Standard 456 Code of practice for plain and reinforced concrete.
- 17.2. **GAUGING CONCRETE:** Aggregate shall be measured in proper gauge boxes. When measuring the fine aggregate due allowance shall be made for the moisture content and the bulk adjusted to suit the mix. The methods adopted for gauging the concrete materials shall have the approval of the Engineer.
- 17.3. **CONCRETE PROPORTIONS:** The concrete shall be of nominal mix as specified in the drawings or in the bill of quantities.
- 17.4. **CONSISTENCY:** The quantity of water used shall be sufficient to produce a dense concrete of adequate workability for its purpose, which will surround and properly grip all the reinforcement.
- 17.5. **CRUSHING STRENGTH:** The crushing strength of the concrete should be as specified in IS.456 for the proposed mixes.
- 17.6. **GAUGING WATER:** The General arrangements for the supply of water for mixing concrete shall be to the satisfaction of the Engineer who will determine the quantity of water to be employed in the mix according to the degree of moisture in the aggregate. The quantity of water thus determined shall be accurately measured for each separate mixing in a suitable container.
- 17.7. **MIXING CONCRETE:** Concrete shall be thoroughly mixed to a uniform consistency in the mixing machines of approved types. Mixing shall continue until the cement is thoroughly distributed throughout the mass, and shall last at least two minutes or for 80 turns of the mixer after the whole of the water has been added. Any concrete showing signs of initial setting before being deposited shall not be used in the works and shall be removed from the site. The concrete shall be discharged from the mixer on to a level watertight platform or floor or into a water tight receptacle. Normally hand mixing of concrete will not be allowed but where the total quantity of concrete is considerably small, the mixing may be done by hand subject to the approval and entirely at the discretion and satisfaction of the Engineer.
- 17.8. **QUALIFIED ENGINEER:** The contractor shall employ qualified Engineer with a qualification of not less than a degree in Engineering who shall be responsible for all concreting carried out for the works. He shall be available at site at all times when concreting is being carried out.
- 17.9. **CONCRETE IN UNSUITABLE WEATHER:** In the event of rain, storms or other severe weather conditions arising, concreting shall be stopped and appropriate temporary stop ends vee groves etc., placed as may be necessary. To meet such circumstances, the contractor shall always have in readiness on the site approved framed sheeting tarpaulins etc., for the protection of newly placed concrete. Should any concrete be damaged due to rain, streams or other weather conditions, the Engineer may order the cutting out /replacement of the damaged concrete at the expenses of the contractor.

- 17.10. **FORM WORK:** This clause is applicable for form work/ centering etc for all the civil works under the specification.
- 17.10.1. The form work shall conform to clause 10 of I.S.456 latest. The contractor entirely responsible for the sufficiency and efficiency of the form work, which term includes moulds, and also for the safe removal of the same. Before commencing the work he shall submit for the approval of the Engineer, details of the form work he proposes to use but such approval shall in no way relieve him of any of his responsibilities for the sufficiency and efficiency of the work and that it will be resistant to the strains imposed on it in vibrating the concrete and will retain all the fines in the concrete as may be necessary to provide the desired concrete surface.
- 17.10.2. The form work shall be designed and arranged so that it will not settle under the load and can be stripped and removed without causing any blemish or jar to the concrete.
- 17.10.3. For beam soffits the contractor shall provide cambers or such other form which will ensure that undersides of beams are truly horizontal or cambered to the extent shown in the drawings.
- 17.10.4. All forms shall be securely braced and supported to prevent any sagging or bulging during construction. In no circumstances shall wire ties be used. All chamber and radius strips. Liners and cores shall be provided where necessary and shall be due to space and securely fixed. All forms shall be fixed to the proper line and trued up immediately before depositing the concrete. All joints shall be close enough to prevent leakage liquid from the concrete.
- 17.10.5. Form work for all exposed faces of mass concrete and for all faces of reinforced concrete shall consist of approved material so finished as to produce the concrete surface, finish specified without any loss of fines and without honey-combing or bulges etc., strutting shall be of such design to allow accurate adjustment and easy removal.
- 17.10.6. Strutting of form work against the sides of the structures which is subject to movement or vibration will not be permitted.
- 17.10.7. The inside faces of the forms shall be treated with mould oil or other approved preparation in either case, that will not have deteriorating effect either the strength or prevent the oil or other approved preparation coming into contact with the reinforcement.
- 17.11. **REMOVAL OF FORM WORK:** The length of time between concreting and the removal of the formwork is the sole responsibility of the contractor. It shall, however, be competent, to the Engineer to require a minimum length of time. For structure foundation, minimum time limit specified is 24 hours for removing form work from date of placing concrete.
- 17.12. **STOP ENDS:** The position of temporary stop ends for vertical joints shall be as approved by the Engineer. Shuttering to form the stops shall be firmly fixed and secured round the reinforcing bars. Such concrete as passes through the stops shall be hacked off and removed as soon as the concrete has set.

- 17.13. **CONSTRUCTION JOINTS:** Recesses of approved size and type shall be formed in construction joints where required by the Engineer in order to form a key with the following concrete. The cost of all shuttering to construction joints shall be deemed to be included in the rates named in the priced bill of quantities. Before Depositing any concrete resting or abutting on work previously carried out the surfaces and ends of the existing work shall be thoroughly raked to such an extent that no portion of the previous surface remains. Thus roughened surfaces shall be thoroughly cleaned off, brushed and watered immediately before the succeeding operations are commenced. The roughened surfaces shall be coated with cement/sand mortar 1/2 inch thick immediately before the concrete of the next layer is placed (special care shall be taken to put the mortar and fresh concrete thoroughly up against the hardened concrete).
- 17.14. **CLEANLINESS OF FORM WORK:** Before concreting is commenced all formwork shall be scrupulously cleaned and wetted, and the contractor shall adopt all necessary measures to ensure that all debris, dirt, wash water and other refuse is removed. The reinforcement and form work will then be inspected by the Engineer and concreting shall not be commenced until the Engineer gives permission. Such inspection shall not however relieve the contractor any of his responsibility for the correctness of the work in every respect.
- 17.15. **EXECUTION OF CONCRETE WORK:** Section limits: Concreting shall be carried out in Sections, not exceeding the limits specified for particular work.
- 17.16. **CASTING PROGRAMME:** The contractor's casting programme shall be such that such section of work can be satisfactorily completed in one operation after permission has been given to proceed. No claim for overtime working to complete a casting programme will be entertained.
- 17.17. **CONVEYANCE OF CONCRETE:** The concrete shall be conveyed from the mixer to its place in the works as rapidly as possible and in such a manner that there shall be no separation or loss of the ingredients. In no circumstances shall more than half an hour lapse between the time when water is added to the mix and the time when the concrete is finally consolidated in position. The use of concrete distributing chutes at an angle of more than 45degrees from the horizontal will not be permitted without the prior written sanction of the Engineer. In no case shall concrete be dropped from barrows or otherwise from a height of more than one and half meters. The arrangements to be adopted by the contractor for conveying and depositing concrete shall be subject to the approval of the Engineer.
- 17.18. **DEPOSITING CONCRETE:** Before any concrete is put in, the contractor shall carryout any filling of pockets or trimming the sides where found necessary to suit the level and line of the concrete to be laid as directed by the Engineer at site. Unless otherwise approved, concrete shall be placed in one operation to the full thickness of members.
- 17.19. **CONSOLIDATING CONCRETE:** Concrete normally shall be consolidated by means of sufficient number of mechanical vibrators. Hand ramming and tamping will only be allowed where specified or by the prior permission of the Executive Engineer. Hand ramming and tamping where permitted shall be sufficient and efficient such as to produce uniform consolidation.
- 17.20. The concrete shall be thoroughly worked all around reinforcement and against shutters so that all entrained air is duly expelled and the concrete surface when stripped be found to be good and free of the formation of air pockets, honey combing or other defects.

- 17.21. The concrete shall be worked into position where placed and not allowed to flow, for sloping beams the work of depositing concrete shall start from the lower end and work upwards.
- 17.22. Except where arrangements, approved by the Engineer are made for placing concrete under water, the areas on which concrete is to be deposited shall be made and kept free from standing water during concreting operations and running water crossing or entering such areas shall be brought under control before concreting is commenced.
- 17.23. **FINISH OF CONCRETE SURFACES:** Immediately any wrought or metal faced for work is struck the surface of the concrete will be inspected by the Engineer and after any remedial work directed or permitted by the Engineer has been completed to his satisfaction, the contractor shall remove all form marks and other imperfections in order to give uniform appearance. The cost of this work shall be included in the rates for concrete.
- 17.24. Floor surfaces shall be worked to a smooth even finish to correct levels of falls as indicated in the drawings or as directed.
- 17.25. Where so directed, concrete floor surfaces shall be treated with silicate of soda grade P.84 diluted with four times its volume of water applied to the work with a watering can or spray and afterwards spread evenly with a mop or brush. Twenty four hours later a second application shall be made and, if any surface still appears porous, further applications of the solution shall be given until the work will absorb no more. Any excess of liquid on the surface after the last coat has been absorbed shall be removed and the surface allowed to dry. When dry it shall be washed with the plain water.
- 17.26. **CURING:** The curing period shall commence immediately after the concrete is finally trowelled or screeded and continued for a period of 21 days. The top and side surfaces of concrete shall be kept moist and be protected from the direct rays of the sun during the period. The contractor shall submit to the Engineer, his proposals for ensuring continuous protection of the concrete during the curing period.
- 17.27. **DEFECTIVE WORK:** Concrete which is defective from any cause what so ever shall, if so directed by the Engineer in charge, be cut out and the work reconstructed at the successful bidder's cost. No concrete thus cut out shall be reused.
- 17.28. The faces of the concrete work shall be sound and solid, free from honey combing. No 'patching' of any concrete facing will be allowed without the express written permission of the Engineer.

Sd/-
Superintending Engineer
OMC, Karimnagar.