

TECHNICAL SPECIFICATIONS

1.0 Scope of work

This covers the technical specifications of the civil/repairing works under scope of this contract and shall be read in conjunction with other documents forming the contract; viz., General condition of contract, NIT, Special condition of contract, MOM, Field quality plan,, Bill of quantities, drawing etc.

2.0 Tender drawing:

Drawings (if required) as listed in special condition of contract enclosed with this tender document form a part of this specification and supplement the requirement specified herein. The tender drawings are preliminary and meant for tender purpose only. These drawings provide a general idea about the work to be performed under scope of this contract and are by no means final drawings showing full range of work under the scope. Work has to be executed strictly according to 'Released for construction' drawings with addition s, alterations and modifications made from time to time as required or approved by 'Engineer –in-charge' and also according to any other drawings that would be released for construction progressively during the execution of the work. The submission of drawings is under the scope of the work in accordance with the technical specifications architectural, design and drawing work.

3.0 General scope of work:

The scope of work contained repairing of pile foundation including installation of MS liner in addition to other civil work as per approved drawing and BOQ.

The work to be performed under this specification shall also include execution of the work including providing all labor, supervision, materials, scaffolding, power, fuel, construction equipment, tools and plants, supplies, transportations, all incidental items not shown or specified but reasonably implied or necessary for successful completion of the work including Contractor's supervision and in strict accordance with the drawings and specifications and with Inspection & Testing Standards. The nature of work shall generally involve excavation in all types of soil including dewatering, shoring, strutting and filling under and around structures, backfilling with available excavated earth and/or sand gravel mixture/sand around completed. All complete as per details and specifications.

4.0 Test of Materials / Workmanship

All tests required for all materials as per Standard Field quality plan of POWERGRID, CPWD specifications and as desired by Engineer –in-charge shall be carried out at contractor's cost. Quality of workmanship shall be as per IS codes, POWERGRID's SFQP , CPWD specifications and to the satisfaction of Engineer –in-charge. It shall be the responsibility of the contractor to facilitate the Engineer –in-charge or his authorized representative for collecting samples of all materials, carrying out the test at the approved laboratory by POWERGRID and submitting the test results.

5.0 Specification for work,

The specifications are intended for general description of work, quality and workmanship. The specifications are not, however, intended to cover the minute details of the work and

the work shall be executed according to relevant IS codes and latest CPWD specifications or to the recommendations of relevant American and British standards as well as the instructions of Engineer –in-charge.

Wherever reference to Indian Standard Codes and practices is made they shall be referred to the latest edition/ revision of the same, issued up to 7 days prior to the date of opening of this tender.

The tenderer is expected to get clarified doubts about the specifications etc. Before tendering in writing with the owner in respect of interpretation of any portion of these documents.

All workmanship shall be according to the current Industry standard and best practices. Before starting a pour the Contractor shall obtain the approval of the Employer in a —Pour Card maintained for this purpose. He shall obtain complete instructions about the material and proportions to be used, Slump / workability, Quantity of water per unit weight of cement, number of test cubes to be taken, type of finishing to be done, any admixture to be added etc.

6.0 Layouts and Levels

The layouts and levels of all structures etc. Shall be made by the contractor at his own cost from general grid of plot and bench marks given by the Engineer –in-charge. The contractor shall also give all help in the form of instruments, materials and men to Engineer –in-charge for checking the detailed layout and correctness of the layout and the levels, at his own cost. But the contractor shall be solely responsible for correctness of layout and levels.

7.0 Construction method:

The tenderer shall submit Drawings, Bar Chart Schedule, List of construction equipment to be deployed and write-up to indicate in a broad outline how he intends to execute the work. These shall form part of this Tender.

8.0 Storage and Handling of common building materials:

All material shall be stored by the contractor in a manner affording convenient access for identification and inspection at all time. The storage arrangement shall be subject to approval of the Engineer –in-charge. Storage of material shall be as described in IS 4082 (latest edition).

All materials shall be so stored as to prevent deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for work. Any material which has deteriorated or has damaged or is otherwise considered defective by the Engineer –in-charge shall not be used and shall be removed from the site immediately, failing which the Engineer –in-charge will get the material removed and cost thereof shall be realized from the contractor's dues. The contractor shall maintain up to date account of receipt, issue and balance (stock wise) of all materials. However, storage and handling procedure of some of the common building materials are explained below as a general guideline:

BRICKS:

Bricks shall not be dumped at site. They shall be stacked in regularities, even as they are unloaded, to minimize breakage and defacement of bricks. Bricks selected for different

situation of use in work shall be stacked separately. Each stack shall contain equal number of bricks preferably not more than 3000.

CEMENT:

Cement shall be stored in dry enclosed shed, well away from the walls and insulated from the floor to avoid contact with moisture. Cement shall be stacked in easily countable stacks and to facilitate removal of first in first out basis. The cement bags shall be gently kept on the floor to avoid leakage of cement from the bags. Sub standard or partially set cement shall be immediately removed from the site as soon as detected. Cement stored for a period beyond 90 days shall be tested before use.

COARSE AND FINE AGGREGATE:

Aggregates shall be stored on brick soling or an equivalent platform so that they do not come in contact with dirt, clay, grass or any other injurious substance at any stage. Aggregate of different sizes shall be kept in separate and easily measurable stacks. If so desired by Engineer –in-charge aggregate from different sources shall be stacked separately with proper care to prevent intermixing.

REINFORCEMENT STEEL:

Reinforcement steel shall be stored consignment – wise and size – wise off the ground and under cover. It shall be protected from rusting, oil, grease and distortion. If directed by Engineer –in-charge, the reinforcement steel may have to be coated with cement wash before stacking to prevent scale and rust formation at no extra cost to the owner. The stacks shall be easily measurable. Only steel needed for immediate use shall be removed from the storage. Fabricated reinforcement shall be carefully stored to prevent damage, distortion, corrosion & deterioration.

9.0 AUTHORITY TO REJECT MATERIALS:

Any material considered to be sub-standard or not up to specifications declared/certified by the Engineer-in-charge shall not be used by the contractor and shall be removed from the site immediately.

10.0 QUALITY ASSURANCE:

The **standard Field Quality Plan** of POWERGRID shall be applicable for all works. The cost of all required tests including associated expenditures shall have to be borne by the contractor.

11.0 Polymer Modified Concrete

Polymer modified concrete shall be minimum M25 Grade and as per relevant IS codes. 10-15mm size coarse aggregate shall be used. Additionally, the work includes chipping of existing excess/bulged concrete around the piles as per direction of Engineer In-charge.. The work also includes cleaning rusted reinforcement by applying rust remover chemical, sifting /transporting of material, all tools and plants required to complete the work. The work also includes installation of steel chamber as per the drawing. However, cost of fabricated steel chamber structure shall be paid separately in relevant item of LoA's BOQ (under MS Liner item and qty is decided as per actual site requirement).

12. MS Liner :

MS liner shall be provided wherever included in the construction drawings released by the employer and/or otherwise required by the employer.

Welding shall be in accordance with IS:816, IS:819, IS:1024, IS:1261, IS:1323, IS:4353 and IS:9595, as appropriate. The works shall be done as per approved fabrication

The unit rate quoted for items shall include all the activities covered in the description of the item as well as all necessary operations described in the specification and any other specific requirements.

The unit rates shall also include all minor activities which are obviously and fairly intended, though may not have been clearly brought out in the description of items or in these documents, but are essential for the satisfactory completion of the work

The measurement for payments shall be made in Metric Ton(MT) corrected upto third place of decimal based on the calculated weight of the M.S. liner as per construction drawing and with reference to the sectional weights of respective thickness of M.S. plate as per Indian Standards. The unit rate quoted shall be inclusive of all wastage

Anti-Corrosive Treatment for Mild Steel Liners

After inspection and acceptance, all steel surfaces shall be coated with a coat of direct to rust primer i.e. Densotrol or equivalent and thereafter these shall be provided with a final coat of minimum 250 microns of high built epoxy coal tar, as specified below. The fabricated mild steel liners to be used for the piling work shall be cleaned from grease or any other contaminant, by mechanical/manual cleaning. The primer shall be applied with a brush or spray to develop a dry film thickness or minimum 25 microns. The primer surface shall be left for curing for at least 24 hours before it is coated with the final coat. The final coat shall consist of high built epoxy coal tar with a thickness of minimum 250 microns. The physical properties of primer and top coat shall be as given below.

Technical data of priming material

Binder content	:	45%
Total Solids	:	45%
Solvent	:	55%
Viscosity	:	16 (Ford Cup No.4)
Density	:	0.88
Flash point	:	+400C
Anti-porosity	:	80/99 in one and two layers, respectively
Heat-resistance	:	170/220 continuously & short period strain.
Contact angle	:	5° (Lorentzon & Westress)
Covering Capacity	:	12-20 Sq.m./litre
Layer thickness	:	12/25 on glossy/coarse surface
Homogeneity	:	No sediment
Thinning	:	Normally, no thinner shall be used.
Drying time	:	Dust-free in 2 hrs, Solid in 4/5 hrs. Between layers from wet-in-wet 2 hrs. for continuous penetration between layers
Luster	:	Semi-glossy
Colour	:	Lightly yellowish
YSAM group	:	2
Injurious to health	:	No
Physiological condition	:	No dangerous gas generation when welding
Application	:	Airless spray equipment or conventional painting with roll/brush.
Cleaning of equipment	:	White spirit

Technical particulars of final coat

System	:	Two Components Component A : Base Part Component B : Accelerator Part
Colour	:	Black
Mixing Ratio	:	1:1 by Weight
% Solid by Weight	:	More than 95%
Pot Life (Temp.27° Relative humidity 65%)	:	2 hours
Setting Time (At 22°C Relative humidity 65%)	:	4-5 hours

Fully cured	:	7 days
Density of cured mass	:	1.35
Flash Pt. of blended product	:	40°C (104°F)
Hardness	:	75 Shore D
Finish	:	Semi glossy
Covering Capacity	:	1.5 sq.m./Kg (400 Microns thk.)
Storage Life	:	1 year in sealed condition.

15.0 Integrity test is not required in the subject work. The SFQP shall be maintained only for the materials associated with repairing/construction work of the package.

Note: The work shall be executed as per latest relevant IS codes, CPWD guidelines or the recommendations of relevant IS Codes/American and British standards.