TECHNICAL SPECIFICATIONS

A) TECHNICAL SPECIFICATIONS FOR CIVIL WORKS

1.0 : SCOPE OF WORK

This covers the technical specifications of the civil 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.

3.1 Test of Materials / Workmanship

All tests required for all materials as per `Field quality plan ', 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, 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.

3.2.1 Specification for work, Quality, Workmanship

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.

HOUSEKEEPING

The Contractor shall maintain and ensure a safe working environment by keeping the Site neat and tidy, and free from hazards and debris. Materials shall be stacked up safely. All work areas and access thereto shall be kept free from hazards and debris. Housekeeping shall be carried out in such a manner and at such times so as not to cause any inconvenience to either the adjoining occupiers or the public. Debris shall be

wetted to minimize the risk of dust. Containers for debris and rubbish are to be provided at the designated places.

DISMANTLING OLD PLASTER

The masonry surface which become exposed after removal of old plaster shall be raked out to a minimum depth of 10 mm in the case of brick work and 20 mm in the case of stone work. The raking shall be carried out uniformly with a raking tool and not with a basuli, and loose mortar dusted off. The surface shall be thoroughly washed with water by using water spray gun.
In case of concrete surfaces, the same shall be thoroughly scrubbed with wire brushes. The surface shall be wash by using water spray gun and cleaned.

REMOVAL OF DAMAGED CONCRETE

At the location, where concrete cover have already spalled eg. Columns corners, soffit of beams, slabs and fins, loose concrete shall be remove 25cm more than the length of spall. For other areas which are not spalled, hammer sounding method shall be use to locate delaminated concrete and mark with paint. Surface repair boundary with 5mm groove using concrete saw cutter with minimum edge length shall be prepare. The beams, slabs shall be supported with props before removal of damaged concrete. After it shall be ensured that the surface to which cement based polymer modified mortar to be bonded & sound, it shall be cleaned off all loose and foreign materials by means of stiff wire brushing. All dust and loose particles resulting from such pre-treatments shall be remove by washing with water under pressure.

REINFORCEMENT CLEANING AND ANTI CORROSIVE COATING

All concrete sticking to the rebars shall remove by light hammering and manual chipping. Wire brush shall be use to remove unwanted oxide from steel surface completely. One coat of rust remover shall be apply all round the steel rebars. The coverage rate of rust clear coating on the steel bars shall be 3.86 sq. m per litre. Care to be taken that the backside of the bars also gets coated with the rust remover. The rust remover shall allow to act for 24 hrs and then steel bars are rubbed with wire brush to remove the rust followed with washing with water jet to completely remove the rust. If the rust is not remove effectively than another coat of rust remover shall be applied, waited for 10 minutes and then again rubbed with wire brush Anti corrosive zinc primer is to be coated on freshly cleaned and dry reinforcing steel on complete periphery as per manufacturer's specifications and allowed the primer to dry for 4 hrs . The second coat of zinc primer after 4hrs of the application of first coat shall also applied. Care is to be taken to cover all the steel without leaving even the smallest part of steel uncovered. The coverage rate of zinc based anti –corrosion coating on the steel bars came out to be about 2.4 sq. m per litre of the chemical. Where the bars having more than 20% of the reinforcement steel bar cross sectional area corroded need to be replace with the additional reinforcement by welding with existing bars or by drilling holes in to concrete and inserting the steel bars with polymer modified concrete/ mortar. If there is severe corrosion of shear stirrups in beams resulting in decrease in diameter by more than 25%, so these are also need to replace with new U- shape stirrups.

REMOVING OF EFFLORESCENCE:

All damaged old concrete/ masonry surfaces are need to free from any deleterious materials such as oil, dust, dirt etc. Before using effluence remover chemical or acid efflorescence shall be removed with a dilute acid solution (such as one part hydrochloric acid in 10 to 20 parts water) or efflorescence removal chemical, dose as per manufacture specification. The treatment shall be carried out by using water spray gun. After treatment the area should be washed with clean water using water spray gun to remove all acid.

APPLICATION OF BONDING COAT TO SUBSTRATE

All concrete surfaces prior to application of bond coat thoroughly for old structure and made free from any deleterious materials such as oil, dust, dirt etc. The surface shall be kept wet for 24hrs ensuring that they are well saturated but free of surfaces water after natural drying. A bonding slurry of cement with SBR polymer to be prepare with a lump free creamy consistency. The bonding slurry shall be apply into surface of the parent body using a stiff brush ensuring that no pin holes are visible. The second coat is to be necessary, the same has been applied at right angle to first coat to ensure complete coverage after the first coat was touch dry. Removing of efflorescence & application of bonding coat under repair of plaster item, no extra payment to be pair for the same.

COLUMN JACKETING

If the columns are badly crack throughout the height shall be jacket with new re-bars and jacketing concrete by 75mm thickness all-round to increase its strength and stiffness and to protect its reinforcement from further corrosion. The ready to use jacketing concrete in which coarse aggregate of 6-10 mm down size is to be added as per recommendation of the manufacture.

MASONARY/CONCRETE CRACKS

The plasticized expanding grout admixtures along with Styrene Butadiene Rubber (SBR) polymer shall be used for sealing of masonry wall cracks. The SBR polymer with the same specifications as for acrylic polymer is to be added to grout admixture for enhancing its bonding with cracked masonry inside.

SYNTHETIC ENAMEL PAINT

Preparation of Surface : Where the existing Paint is firm and sound it shall be cleaned of grease, smoke etc. and rubbed with sand paper to remove all loose particles dusted off. All patches and cracks shall then be treated with stopping and filler prepared with the specified Paint. The surface shall again be rubbed and made smooth and uniform.

Painting : The number of coats as stipulated in the item shall be applied with synthetic enamel Paint. Each coat shall be allowed to dry and rubbed down smooth with very fine wet abrasive paper, to get an even glossy surface. If however, the surface is not satisfactory additional coats as required shall be applied to get correct finish.

Application : The synthetic enamel Paint shall be applied with brushes, worked well into the surface and spread even and smooth. Paint shall be applied with a brush on the cleaned and smooth surface. Horizontal strokes shall be given, First and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks.

FABRICATION OF STRUCTURAL STEEL

The steel sections as specified shall be straightened and cut square to correct lengths and measured with a steel tape. The cut ends exposed to view shall be finished smooth. All straightening and shaping to form, shall be done by pressure. Bending or cutting shall be carried out in such a manner as not to impair the strength of the metal.

CURING

Curing shall be done as per specific work according to relevant documents.

Note:

i) Those items are not available in specification shall follow the POWERGID specification, CPWD latest specification & relevant IS Code.

ii) Consumption of materials as per above specification or manufacturer specification, whichever is higher is applicable.

iii) Contractor shall have to mobilized additional resources such as tools & plants, manpower and materials as understood necessary by the Engineer-in-charge without any extra cost to POWERGRID.

3.3 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.

AUTHORITY TO REJEECT 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.

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.

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