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 MAHAGENCO Maharashtra State Power Generation Co. Ltd.	MAHARASHTRA STATE POWER GENERATION CO. LTD.	Volume: VI-B
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1.0 <u>SCOPE</u> This specification covers supplying, installation, repairing, finishing, testing, protection and maintenance till handing over of removable free access false flooring systems consisting of an assembly of panels mounted on adjustable pedestal and supporting steel grid system to provide an under floor space. 2.0 <u>FALSE FLOORING SYSTEM</u> 2.1 <u>BASE</u> The system shall be placed over a base of R.C.C. floor slab and with necessary grouting etc. to fix the supporting structure. 2.2 <u>SUPPORTING STRUCTURE</u> The supporting structure shall comprise of fabricated jacks made out of 25 mm. dia. MS rounds having 150 mm. threads at top. This jack shall be welded to 100 mm x 100 mm x 6 mm thick MS base plate pedestal. Pedestals shall be vertically true and located at 600 mm centre to centre to conform to the size of the floor panels and shall be fixed to the RCC floor slab with ARALDITE. The jack shall be equipped with locking device to prevent loss of finished elevation. Adjustment shall be provided by the threaded rod member and elevating nut. The capital shall be of aluminium alloy die cast and shall receive cold rolled MS floor supporting channels of size 40 mm x 40 mm x 3.15 mm thickness as per drawings, both for main and cross runners. The pedestal shall be equipped with conducting grounding pad. All MS members shall be treated with steel protective paint as per drawing. 2.3 <u>FLOOR PANEL</u> 2.3.1 The floor panels shall be made of phenol for maldehyde bonded particle board treated with fire resistant paint as per schedule items. Size of each panel shall be 600 mm x 600 mm with all panel edges finished to a tolerance of + 0.25 mm on the diagonals. The edges of the floor panels shall be covered by 4 mm. thick rigid PVC edging. The underside of the panel		

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shall have 0.05 mm. thick Aluminium foil which shall be fixed to the particle board with resin-based adhesive. 2.4 <u>STRENGTH</u> Each 600 mm x 600 mm floor panel must be capable of supporting an uniform minimum live load of 1220 Kg/Sq. M or a concentrated minimum load of 450 Kg. applied through a phenolic caster 75 mm in diameter and 45 mm wide, or a rolling minimum load of 450 Kg. at any point with a maximum deflection of 2 mm. The ultimate strength shall be capable of carrying a 2300 Kg. axial load without deformation of any part. 2.5 <u>SURFACE FINISH</u> All removable panels shall have the top surface finished with 2 mm thick Antistatic Vinyl Flooring bonded to the surface with adhesive as per manufacturer's specification. 2.6 <u>SKIRTING</u> Skirting shall be of the same Antistatic Vinyltiles, 150 mm. high and 2 mm. thick, completely matching with the false flooring surface and shall be fixed with the plastered wall surface as per manufacturer's specification. 2.7 <u>INSTALLATION</u> All steel surface are to be protected by pointing over a primer as per schedule of items and any damage to the paint during installation shall be made good. Finished floor surface, when specified by the Engineer-in-Charge shall be protected by the Contractor with kraft paper taped and sealed at edges to prevent tearing. Any damage to the sub floor during installation of the false flooring system shall be made good by the Contractor without to the owner.		

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3.0 <u>ACCEPTANCE CRITERIA</u> The false flooring system shall be checked specially for: (a) Level (b) Alignment of joints (c) Thickness of joints (d) Surface finish (e) Colour and texture		

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1.0 <u>SCOPE</u> This shall include supply, fitting and fixing of timber frames to doors and windows with M S holdfasts, paneled or flush doors, windows, shutters, partitions, wall paneling, pelmets, shelves, furniture, etc. as shown in drawings, including a prime coat of approved paint, varnish, or fixing of decorative plastic laminate. This shall also include the supply and fixing of all hardware and fixtures shown in drawing. 2.0 <u>INSTALLATION</u> 2.1 <u>MATERIALS</u> 2.1.1 Timber Unless otherwise specified, all timber shall be best quality well seasoned C P teakwood free from large or loose, knots cracks or other defects. Where specified, timber shall be treated with approved wood preservative before use. Before starting the carpenters work, the Tenderer shall have the rough timber approved by the Engineer. 2.1.2 Plywood Plywood shall be commercial quality with decorative surface veneer. Unless specifically permitted otherwise, the adhesive used in plywood shall be phenol-formaldehyde resin of B W R grade conforming to IS:848. 2.1.3 Decorative Laminated Plastic Sheets The colour, pattern, finish and texture shall be approved by the Engineer and the bulk supply procured in sheet sizes which will ensure the least number or joints in one surface. 2.1.4 Flush Doors Flush doors shall be hollow or solid core doors with commercial or decorative faces and hardwood edges. The core for solid core doors shall be of block board or wood particle board. Manufacturer's literature and test		

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	certificates shall be submitted for the approval of the Engineer. The Contractor shall give a guarantee that the adhesive used is phenol formaldehyde of B W R grade, conforming to IS:848. The thickness shall be as specified in the drawing. 2.1.5 Panel Doors Panel door shall be of teakwood shutter frame and panels of teakwood. Other considerations shall be as mentioned in item (d) above. 2.1.6 Fixtures Fixtures for doors, windows, furniture, etc. shall be as shown on drawing. 2.2 <u>WORKMANSHIP</u> 2.2.1 General The work shall be done by skilled carpenters as per details shown on drawing or instructed by the Engineer. Framing timber and other work shall be close-fitting with proper wood joinery, accurately set to required lines or levels and rigidly secured in place. The surface of frames etc. which will come in contact with masonry after fixing, shall be given two coats of approved paint before fixing. Mastic caulking shall be done after fixing external door and window frames. Special care shall be taken to match the grain of timber or plywood which will be subsequently polished. Screwing or nailing will not be permitted to the edge of plywood and particle board. The edge of all plywood, blockboard and particle board shall be finished with teakwood lipping unless otherwise shown on drawings. Fixing for frames and partitions shall generally be with 40 mm x 6 mm x 300 mm long M S holdfasts bifurcated at end and grouted with 1:2:4 cement concrete. The gap between masonry and external door and window frame shall be caulked with polysulphide mastic. M S grills or guard bars shall be provided to windows where called for in the drawings.	

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2.2.2	Finish All carpentry work after finishing shall be sand papered smooth. A prime coat paint shall be given after inspection of the Engineer to all surfaces other than those which shall be subsequently polished or covered with laminated plastic sheet.	
2.2.3	Surface Treatment When shown on drawings decorative ply or laminated plastic sheets shall be bonded under pressure to the surface to be finished. The adhesive used shall be of approved brand and brought to site in sealed containers. The rate of application and the length of time for which the pressure is to be applied shall be as per the manufacturer's instructions. The edge of sheets shall be protected by teak lipping or beveled as shown on drawings.	
3.0	<u>ACCEPTANCE CRITERIA</u>	
3.1	<u>DOOR AND WINDOW FRAMES</u> All frames shall be square and flat at the time of delivery and shall be checked for dimensions and corner angles. After fixing they shall be on a fine vertical plane. All external door and window frames shall be caulked with mastic.	
3.2	<u>DOOR AND WINDOW SHUTTERS</u> Shall be of proper size, shape and design and free of warp. When fixed to frames, these shall operate smoothly without jamming and all latching or locking devices shall engage properly without undue pressure.	
3.3	<u>PARTITIONS, PANELING, PELMETS, FURNITURE, ETC</u>	
3.3.1	General These shall conform to drawings in all details. No unsightly nailmarks etc. shall be permitted. Plywood grains shall be matched to give a uniform and pleasing appearance.	

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3.3.2 Partition Shall be checked for rigidity of fixing, plumb and horizontal as well as vertical alignment. 3.3.3 Pelmet Shall be checked for rigidity of fixing and adequate clearance of fixture. 3.3.4 Cupboard Shutters Shall operate smoothly without jamming and locks, bolts and double ball catches shall engage securely. Single ball catches shall not be used. 3.3.5 Drawers Shall operate smoothly and have back stops to prevent them from being pushed too far. Locks shall engage securely. 3.3.6 Loose Furniture When placed on a level surface tables tops etc. shall be horizontal and the pieces stand stably on legs or supports. 4.0 <u>I.S. CODES</u> Some of the important relevant Codes for the Section are: (a) IS:4021 : Timber door, window and ventilator frames (b) IS: 1003 : Timber paneled and glazed shutters (c) IS:2191 : Wooden flush door shutter (Cellular and hollow core type). (d) IS:2202 : Wooden flush door shutters (solid core type).		

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VOLUME VI-B SECTION – 13 SUSPENDED CEILING		

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1.0 <u>SCOPE</u> This specification covers the furnishing of all materials, labour, tools, equipment, supervision and services necessary for incidental to the supply, installation, finishing and completion of suspended ceiling work of various profiles and at all elevations as per drawing, specification and instruction of Architect/Owner. The work shall also include providing openings in the ceiling for lighting fixtures, air conditioning diffusers etc as shown in drawing and instruction of Architect/Engineer. 2.0 <u>MATERIAL</u> 2.1 <u>ALUMINIUM GRID SUSPENSION SYSTEM</u> 2.1.1 Suspender : Shall be fabricated from 10 dia M.S. rod angle, flast or as required to suit ceiling profile and suspension system with turnbuckle for adjustment of levels. All M.S. works shall have one coat of synthetic enamel paint over a coat of red lead primer. 2.1.2 Frame work/grid : shall be of aluminium sections as follows : Wall angle - 25 x 25 x 1.6 mm. thick. Main Tee - 35 x 25 x 1.6 mm. thick Cross Tee - 25 x 25 x 1.6 mm. thick Tees shall be jointed with adequate cleats etc. 2.2 <u>CEILING PANEL</u> 2.2.1 For 150C Type Un-perforated False Ceiling (a) Un-perforated Aluminium panel of size 150mm wide x 15mm deep made up of 0.5mm thick square edged, panel length up to 6m. Panel shall be clipped to an Aluminium panel carrier of 32mm wide x 39mm		

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deep made of 0.95mm thick in standard length of 5m with cutouts to hold the panels in a module of 150mm. The carrier shall be suspended by means of GI suspension rod of 4mm diameter and a galvanized steel suspension spring clip at a distance of 1.5m (max.) centre to centre in both directions. The suspension rod shall be fixed to RCC ceiling / beam with suitable GI 'J' hook and nylon inserts (galvanization to be done as per IS 1367 – minimum coating 250 g/Sq.m.). The suspension spring clip shall be made of spring steel and shall have cutout and holes to fit into the carrier from one side and hold the rod hanger from another side. Providing and laying Rockloyd Resin Bonded Mineral Wool of density 48 Kg/M3 and thickness 50mm encased in black polythene. (b) The edge profile wherever required as per architectural drawings and direction of Engineer-in-Charge shall be 'L' shaped profile manufactured out of 0.5mm thick Al-Mg Alloy of approved colour and shall be fixed to walls or panels as required. (c) Aluminium panel splice made of 0.5mm thick, 150mm wide x 15mm deep shall be provided and installed to connect / join panels at each point. (d) Aluminium carrier splice made 0.95mm thick, 32mm wide and 39mm deep shall be provided and installed to connect / join carriers at each point. (e) All panels, panel splice, edge profiles shall be made of Aluminium coil coated on a continuous paint line and roll formed from corrosion resistant Aluminium Alloy AA-3105 or equivalent (Al-Mg) for higher strength and good roll forming characteristics. All carriers and their splices shall be made of Aluminium, stove enamelled alloy AA-5050 or AA-5052 or equivalent (Al-Mg) of black colour. (f) Mode of measurement : Measurement shall be wall to wall along with the ceiling. Fascias to be measured separately without any deductions for lights, diffusers, grills etc. Nothing extra shall be paid for cutting and framing around lights, diffusers etc. as well for		

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providing punched holes for sprinklers, smoke detectors etc. as per requirement of architectural drawings. 2.2.2 Aluminium Tile Ceiling of 600mm x 600mm size Tiles (a) The tile size shall be 600mm x 600mm made of 0.7mm thick bevel edged Aluminium Alloy AA-3105 sheet. The tile will be manufactured on advanced equipment, which includes several levelling stages in the manufacturing process. Tile ends will be raised with pipes and stop to ensure positive engagement into the spring to enable for demounting of individual panel. The tile sides will be sufficiently high to ensure a minimum deflection across the length of tile. All tiles will be polyester based, powder coated in white colour. Tiles shall be clipped into clip in profile of 0.5mm thick. The clip in profile shall be at a distance of 600mm center to center. The clip in profile shall be supported from RCC ceiling / beam by means of GI suspension rod shall be fixed to RCC surface by means of suitable expansion wedge hold fastener of minimum size 8mm dia 50mm long made of galvanized steel (galvanization to be done as per IS 1367 – minimum coating 250g/Sq.m.). Providing and laying Rocklloyd Resin Bonded Mineral Wool of density 48 Kg/M3 and thickness 50mm encased in black polythene. (b) Edge profile wherever required, as per architectural drawings and direction of Engineer-In-Charge shall be 'L' shaped or equivalent Aluminium profile of 23mm x 23mm and 0.7mm thick. This profile shall be used in the corner and places where the false ceiling shall be terminated. (c) All perforated panels (if perforated tiles are being selected by the owner in place of non-perforated tiles) shall have non- woven tissue lining black coloured and glazed to the clip-in- profile side for the purpose of acoustical insulation. (d) The clip in profile splice shall be made of 0.50mm thick GI sheet and use to connect clip in profile. (e) Mode of measurement : Measurement shall be wall to wall along with the ceiling. Fascias to be measured separately without any		

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deductions for lights, diffusers, grills etc. Nothing extra shall be paid for cutting and framing around lights, diffusers etc. as well for providing punched holes for sprinklers, smoke detectors etc. as per requirement of architectural drawings. 3.0 <u>INSTALLATION</u> 3.1 The ceiling grid shall be suspended from structural walls slabs, beams truss structural steel etc. with suspender fabricated from M.S.rod/ angles/flasts etc. to the required level. The entire suspension system shall be of sufficient strength and rigidity to allow placing of planks over the grid for movement of maintenance personnel to attend various electrical and air conditioning installation over the ceiling and to carry ceiling panels in true level and plane without exceeding a deflecting of 1/360th of their span. All ceiling panels shall be secured in position using hold down clips of sufficient number. All joints in ceiling panels shall run straight. The installation of ceiling system shall be strictly as per drawing. 4.0 <u>SHOP DRAWINGS</u> 4.1 Contractor shall prepare complete working details layout based on the conceptual layout and design of suspended ceiling and illumination and air conditioning layout shown on the drawings and obtain approval from the Architect/Owner before installation. 5.0 <u>WORKMANSHIP</u> 5.1 Shall be done in the best workmanlike manner by the manufacturer authorised agency in accordance with manufacturer standards and recommendations. 6.0 <u>SAMPLES</u> 6.1 3 (three) mock-up samples of reasonable size showing standard grid with panels and suspender etc. having desired finish, colour etc. shall be submitted to the Architect/Owner for approval before materials are Delivered at site. Installed material shall match approved samples.		

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7.0 <u>ACCEPTANCE CRITERIA</u> Finished ceiling shall be at the correct plane and present a pleasing and uniform appearance, free from sags, warps, figures or damaged boards. Joints, exposed grids etc. shall be in true lines and symmetrically placed in manner shown on drawings. Cutouts for light fixtures, diffusers etc. shall be of exact dimensions and in exact locations. 8.0 <u>I.S. CODES</u> (a) IS:2441 : Code of Practice for fixing ceiling coverings.		

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1.0 <u>SCOPE</u> The work in general shall consist of supplying and/or erecting and installing of all metal doors, windows, ventilators, louvres, glazed partitions, etc. as shown on drawings with all materials complete excluding supply of glass and glazing. The scope of work shall also include the assembly and the Owner from the store at site shall supply erection of all doors, windows, louvres, glazed partitions, etc. for which fabricated materials. Supplying and/or fixing of all door and window accessories and hardware are also included in the scope. 2.0 <u>INSTALLATION</u> 2.1 <u>MATERIALS</u> Steel sections used for fabrication of doors, windows etc. shall be standard rolled steel sections specified in IS: 1038 and IS: 1361 or as specified in drawing and schedules. Steel sheets for frames, shutters, louver blades etc. shall be of gauge mentioned in drawings and schedules. Aluminium sections for fabricating doors, windows, partitions, etc. shall be extruded sections conforming to IS: 1948 and 1949 or as manufactured by Indian Aluminium Company Limited or approved equivalent. The alloy used shall conform to IS Designation HE 9-WP of IS: 733. Hardware and fixtures shall be as specified in "Schedule of Fixtures" and the best quality from approved manufacturers shall only be used. The Tenderer shall specifically state the particular manufacturer's materials he proposes to use. "Schedule of Fixtures" is for the purpose of stating the minimum requirement and improper alignment or faulty operation due to inadequate strength of hardware or fixture shall entirely be the Contractor's responsibility All hardware and fixtures shall be able to withstand repeated use. Door closers shall conform to IS: 3564 and shall be suitable for doors		

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weighing 61- 80 Kg. unless otherwise stated in schedule. Each closer shall be guaranteed against manufacturing defect for one year and any defect found within this period shall be rectified or the closer replaced free of charge. Concealed door closers shall be either floor mounted or transom mounted, suitable for installation with metal doors. It shall conform to the performance requirements & endurance test stated in IS: 3564 Appendix-A. The Contractor shall submit samples of each type of hardware to the Engineer. The approved samples shall be retained by the Engineer for comparison of bulk supply. The samples shall be returned to the Contractor towards the end for incorporation in the job. The mastic for caulking shall be of best quality from a manufacturer approved by the Engineer. In general, the mastic for fixing of metal frames shall be as per IS: 1081 and/or as approved by the Engineer. 2.2 <u>FABRICATION</u> 2.2.1 Steel Doors, Windows, Ventilators, Louvers, etc. (a) Door Frames Frames shall be fabricated from 16 G sheets. They shall be mortised, reinforced, drilled and tapped for hinges and lock and bolt strikes. Where necessary, frames shall be reinforced for door closers. Welded construction with mitered corners shall be used. Rubber door silencers shall be furnished for the striking jamb. Loose "T" masonry anchors shall be provided. Frames shall finish flush with floor and adjustable floor anchors shall be supplied. Frames shall be brought to site with floor ties/weather bars installed in place. (b) Double Plate Flush Door Shutters Door shutters shall be 45 mm thick, completely flush design and shall comprised of two outer sheets or 18 G steel sheets, rigidly connected and reinforced inside with continuous vertical 20 G stiffeners, spot welded in position at not more than 150 mm on centers.		

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Both edges of doors shall be joined and reinforced full height by steel channels placed immediately inside and welded to the door faces. Top and bottom of doors shall be reinforced horizontally as shown on drawing by steel channels running full width of door. Doors shall not have more than 2.5 mm clearance at jambs and heads, shall have proper level on lock stiles and rails to operate without binding, and shall be reinforced at corners to prevent sagging or twisting. Pairs or double doors shall have meeting stile edges bevelled or rebated. Where shown on drawing or called for in the schedule of items the doors shall be sound deadened by filling the inside voids with mineral wool or other suitable approved materials. Doors shall be mortised, reinforced, drilled and tapped in shop for hinges, locks and bolts. They shall also be reinforced for closers, push-plates and other surface hardware where necessary. Any drilling and tapping required for surface hardware shall be done at site. Where shown in drawing, provision shall be made for fixing glazing, vision panels, louvers etc. glazing mouldings shall be of 18 G steel or extruded aluminium sections with profiles shown in drawing and suitable for fixing 6 mm glass. Louvers blades shall be V or Z shaped and made out of 16 G sheets. (c) Single Sheet Door Shutters Single sheet doors shall be made from best quality 18 G mild steel sheets and shall present a flush surface on the outside. The inside shall be stiffened with semi-tubular edge and central stiffening rail, which shall convey the lock and other furniture. The frames shall be made from best quality 16 G mild steel sheets. Wherever required as shown on drawings, provisions for fixing glass panes, louvers, etc. shall be made. The manufacturing shall be done as specified in clause No .2.2.1.b "Double Plate Flush Door Shutters". (d) Sliding Doors Sliding doors shall be either double plate or single plate construction		

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as called for in drawings and schedules made out of 18 gauge steel sheets with adequate stiffeners. The Contractor shall specify the weight of the door in his shop and submit the manufacturer's catalogue of the sliding gear he proposes to use. Where shown on drawings or call for in the Schedule of Items, the Contractor shall make provision for openings to the door for monorail beams. Doors shall close positively to exclude rainwater from seeping in. When called for in schedule, sliding doors shall withstand specified wind loads without buckling or jamming. The door shall slide freely under all ambient conditions. (e) Door Threshold Door threshold shall be provided as shown on drawing. Doors without threshold shall have bottom tie of approved type. (f) Steel Windows, Sashes, and Ventilators etc. These shall conform in all respects to IS: 1038 and IS: 1361 latest editions and as shown on drawings. The details as called for in the above codes shall be applicable for coupling mullions, transoms, weather bars, pivot arrangements for ventilators, etc. or as shown on drawings or called for in the Schedule of Items. All welds shall be dressed flush on all exposed and contact surfaces. Where composite unit openings are shown on drawings, the individual window units shall be joined together with requisite transoms and mullions as shown on drawings. All windows shall be outside glazed fixed with putty or metal glazing beads as shown on the drawings and/or specified under Schedule of Items. Where aluminium glazing beads are specified they shall be extruded aluminium channel 9.5 mm x 9.5 mm x 1.6 mm (Indal Section No. 2209) unless otherwise shown on drawings. Aluminium beads shall be given one coat of zinc chromate primer before fixing to windows. 2.2.2 Aluminium Door, Windows and Frames Extruded sections shall have a minimum 3 mm wall thickness. All sections shall be approved by the Engineer before fabrication is taken up. Doors,		

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frames, mullions, transom etc. shall be anodized in a bath of sulphuric acid to provide a clear coating of minimum 0.6 mm thickness. The anodized materials shall then be sealed by immersing in boiling water for 15 minutes. A protective transparent coating shall be applied to the sections before shipment from the factory. All work shall be fitted and shop assembled to a first class job and ready for erection. Shop joints shall be made to hairlines and then welded or braced by such method as will produce a uniform colour throughout the work. Work on the above, other than described, shall be carefully fitted and assembled with neat joints with concealed fasteners. Wherever possible, joints shall be made in concealed locations and on edges of doors. Field connections of all work may be made with concealed screws or other approved type of fasteners. Glazing beads shall be snap fit type without visible screws and shall be of sizes to accommodate 6 mm thick glazing. All work shall be adequately braced and reinforced as necessary for strength and rigidity. 2.2.3 Aluminium Structural Glazing Providing and fixing of barriered semi unitised structural glazing system at all levels through designing and selection of mullion and transoms profiles anodised (15 to 20 micron) or powder coated (50 to 70 micron), selected for their fixing on the structure depending on the structural conditions, functional, statistical requirement and should withstand the wind load criteria as per IS-875 (part-III) – 1987. System should provide proper rebate areas for air pressure compensation /water drainage at required stages. Double insulated hard coated toughened glass consist of 6mm outer single safety glass, 12mm inter space and 6mm inner clear glass panel glued onto the glass glazing frame profile selected according to the vision / spandrel panel (Aluminium Composite Panels) requirement with DC 995 structural sealant. Proper supporting element should be provided for taking care of the respective infill load and reliving in case of the glass bonding failure. (The profile sections shall be Hindalco Alupuram unit, HYDRO product or equivalent). Floor to floor height would be 4.2m approx and width of glazing supporting frame would be 1.0m approx.		

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2.3 <u>SHOP COAT OR PAINT</u> The shop paint for steel doors, windows, etc. shall be best lead or zinc chromate primer paint from approved manufacturer. All surfaces shall be thoroughly cleaned of rust, grease, loose mill scales etc. and given one coat of shop paint. Portions like mullions, transoms etc. that will be inaccessible after assembly of units shall be given an extra coat of paint before assembly. Where called for in the Schedule of Items all steel doors, windows, etc. shall be hot dip galvanised to give a coating weight of 1-1/2 - 2 Oz per sq. ft. One coat zinc chromate primer coat shall then be applied as shop paint. Portions of aluminium frame which come in contact with masonry construction shall before shipment from workshop be protected with a heavy coat of alkali paint. Aluminium coming in contact with other incompatible metals shall be coated with zinc chromate primer. 2.4 <u>HANDLING & STORAGE OF FABRICATED MATERIAL</u> All metal doors, windows, etc. shall be packed and crated properly before dispatch to ensure that there will be no damage to the fabricated materials. Loading into wagons and trucks shall be done with all care to ensure safe arrival of materials at site in undamaged condition. When taking delivery of items supplied by Owner, the Contractor shall satisfy himself that the items supplied are upto the specified standard. Any defect detected shall promptly be brought to the notice of the Engineer. All metal doors, windows, etc. shall be stored under cover in a way to prevent damage or distortion. Special care shall be taken to prevent staining of aluminum products by rust, mortar, etc. 2.5 <u>ASSEMBLY & ERECTION AT SITE</u> In general, the fixing of steel doors, windows, ventilators, louvers, etc. shall conform to IS: 1081 and as shown on drawings. The Contractor shall assemble and install all steel doors, windows, sashes, fixed metal louvers, etc. including transoms and mullions for composite units in		

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respective places as shown on drawing keeping proper lines and levels, and in approved workman like manner to give trouble free and leak-proof installations. The installation shall be done according to the instructions of the manufacturer, and/or as approved by the Engineer. If required by the Engineer, the installation shall have to be carried out under the supervision of the manufacturer's staff. The Contractor shall take every precaution against damage of the components during installation. Necessary holes, chases, etc. required for fixing shall be made by the Contractor and made good again as per original, after installation without any extra charge. After installation of steel doors, windows, etc. all abrasions to shop-coat of paint shall be retouched and made good with the same quality of paint used in shop coat. All coupling mullions, transoms, frames, etc. in contact with adjacent steel and other members, shall be well bedded in mastic. The Contractor shall bring to the site the mastic cement in original sealed containers of manufacturer and shall apply it as per the instructions. For all frames supplied by either the Owner or the Contractor mastic shall be supplied by the Contractor and caulking done properly as per drawings, specifications and as per instructions of the Engineer. Door shutters, partitions hardware fixtures etc. shall be fixed only after major equipments have been installed in rooms Wherever required nylon cords of approved quality shall be supplied along with pivoted sashes and shall be of adequate length to terminate one metre from the floor. Loose ends of cords shall end in metal or plastic pull as approved by the Engineer. 3.0 <u>ACCEPTANCE CRITERIA</u> 3.1 <u>FOR FABRICATED ITEMS</u> 3.1.1 Overall dimensions shall be within ± 1.5 mm of the size shown on drawings. 3.1.2 Mullions, transoms etc. shall be in one length and permissible deviations from straightness shall be limited to ± 1.5 mm from the axis of the member.		

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3.1.3 Door and window shutters shall operate without jamming. The clearance at head and jamb for door shutters shall not exceed 1.5 mm. For double leaf doors, the gap at the meeting stiles shall not be more than 1.5 mm. 3.1.4 Door leaves shall be undercut where shown on drawings. 3.1.5 Doors, windows, frames, etc. shall be on a true planes, free from warp or buckle. 3.1.6 All welds shall be dressed flush on exposed and contact surfaces. 3.1.7 Correctness of location and smoothness of operations of all shop installed hardware and fixtures. 3.1.8 Provisions for hardware and fixtures to be installed at site. 3.1.9 Glazing beads shall be cut with mitered corners. 3.1.10 Glazing clips, fixing devices etc. shall be supplied in adequate numbers. 3.1.11 Shop coats shall be properly applied. 3.1.12 Exposed aluminium surfaces shall be free from scratches, stains and discolouration. Anodised surfaces shall present a uniform and pleasing look. 3.2 <u>FOR INSTALLED ITEMS</u> 3.2.1 Installations shall be at correct location, elevation and in general on a true vertical plane. 3.2.2 Fixing details shall be strictly as shown on drawings. 3.2.3 Assembly of composite units shall be strictly as per drawings with mastic caulking of transoms and mullions, gaskets, weather strips etc. complete		

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3.2.4	All frames on external walls shall be mastic caulked to prevent leakage through joint between frames and masonry.	
3.2.5	All openable section shall operate smoothly without jamming.	
3.2.6	Locks, fasteners, etc. shall engage positively. Keys shall be non interchangeable.	
3.2.7	Cutting to concrete or masonry shall be made good and all abrasions to shop paint shall be touched up with paint of same quality as shop paint.	
3.2.8	Aluminium doors, windows, etc. shall be free from scratches stain or discolouration.	
4.0	<u>INFORMATION TO BE SUBMITTED</u>	
4.1	<u>WITH TENDER</u>	
4.1.1	Names of manufacturers for doors, windows, etc.	
4.1.2	Manufacturer's catalogue for all hardware and fixtures proposed to be used.	
4.2	<u>AFTER AWARD</u>	
4.2.1	Before starting fabrication of all metal doors, windows, etc. the Contractor shall submit detailed fabrication drawings to the Engineer for approval. The fabrication shall be started only after approval of drawings.	
4.2.2	He shall submit a programme of work to be done for the approval of the Engineer.	
4.2.3	Before bulk supply, he shall submit for the approval of the Engineer samples of all bought out items and samples of each type of fabricated items. The samples shall be retained by the Engineer for comparison of bulk supply and returned to the Contractor towards the end for final incorporation in the job.	

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5.0 <u>I.S. CODES</u> Following are some of the important I.S. Codes as relevant to this section: (a) IS: 1038 : Steel doors, windows and ventilators (b) IS: 1361 : Steel windows for industrial buildings (c) IS: 1948 : Aluminium doors windows and ventilators (d) IS: 1949 : Aluminium windows for industrial buildings (e) IS: 4351 : Steel doorframes (f) IS: 1081 : Code of practice for fixing and glazing of (steel and aluminium) doors, windows, And ventilators. Metal		

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1.0 <u>SCOPE</u> The work in general shall consist of supplying and fixing all glass and glazing including all clips, putty, mastic cement etc. wherever required as shown on drawings and specifications, supply of metal glazing beads and neoprene gaskets shall not be included in this scope. This shall also include the fixing of all glass and glazing supplied by the Owner at his site stores. 2.0 <u>INSTALLATION</u> 2.1 <u>GENERAL</u> The Contractor shall supply and install all glass and glazing as required for various doors, windows, sashes, ventilators and fixed louvres, miscellaneous glazing and partitions, unless otherwise stated from approved manufacturer having uniform refractive index and free from flaws, specks and bubbles. The glass shall be brought to site in the original packing from the manufacturer and cut to size at site. 2.2 <u>MATERIALS</u> 2.2.1 Glare reducing or heat absorbing glass shall be of approved manufacturer and special care shall be taken to grind smooth and round off the edges before fixing. 2.2.2 Glass shall be float glass of required thickness and shall be clear or tinted as indicated. 2.2.3 Wired glass shall be thick rolled glass with centrally embedded 42g. Wire mesh of Georgian type. This may be of clear or coloured glass, as shown on drawings. 2.2.4 Obscure glass shall have a cast surface in one side. 2.2.5 Coloured and figured glass shall be as per approved sample.		

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2.2.6	In general, the putty shall conform to IS : 400 and be of best quality from approved manufacturer. It shall be brought to site in the manufacturer's original packing. Quick setting putty glass is used where it shall be non-setting type. 2.2.7 EPDM gaskets with snap-fit glazing beads shall be fixed as per manufacturer's instructions and shall sit snugly against glass to give a leak proof installation. 2.2.8 Float glass 2.2.9 Double glazing 2.3 <u>GLAZING, SETTING AND FINISH</u> All glazing clips, bolts, nuts, putty, mastic cement etc. as required shall be supplied by the Contractor. All glass shall be thoroughly cleaned before putting in position. Each glass pane shall be held in place by special glazing clips of approved type. As specified in relevant I.S. Codes, four glazing chips shall be provided per glass pane, except for large panes where six or more clips shall be used as per Engineer's instructions. All holes that may be necessary for holding the clips glazing heads and all other attachments shall be drilled by the Contractor. Glass panes shall be set without springing, and shall be bedded in putty and back puttied, except where moulding or gasket are specified, putty, mastic cement etc. shall be smoothly finished to the even line and figured glass shall be set with smooth side out. After completion of glazing work, the Contractor shall remove all dirt stains, excess putty etc. clean the glass panes and leave the work in perfectly acceptable condition. All broken cracked or damaged glass shall be replaced by new ones.	

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3.0 <u>ACCEPTANCE CRITERIA</u> 3.1 All installation shall be free from cracked, broken or damaged glass. Edges of large panes of thicker glass and heat absorbing glass shall be inspected carefully for chipped, cracked or underground edges. 3.2 Glazing shall be carefully done to avoid direct contact with metal frames. 3.3 All glass shall be embedded in mastic or fixed by neoprene gaskets to give a leak proof installation. 3.4 At completion, the panes shall be free from dirt, stains, excess putty etc. to the complete satisfaction of the Engineer. 4.0 <u>I.S. CODES</u> Following are some of the important I.S. Codes relevant to this Section: (a) IS : 3548 : Code of practice for glazing in building. (b) IS:1083 : Code of practice for fixing and glazing metal doors, windows & ventilators.		

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1.0 <u>SCOPE</u> This specification covers the design, supply of materials, fabrication, delivery and erection of Rolling Shutters/Grills with motor drive and/or manual operation including all accessories as hereinafter specified. 2.0 <u>INSTALLATION</u> 2.1 <u>COMPONENTS</u> 2.1.1 Slats for rolling shutters shall be made from tested bright cold rolled, annealed M.S. strips, not less than 0.9 mm thick for shutters upto 4.5 M wide and not less than 2.25 mm thick for shutters 5.5 M wide and above, machine rolled at 75 mm rolling centres, interlocking with each other. The profile will be such as to prevent excessive deflection under specified wind load. 2.1.2 Rolling grills shall be constructed out of 6 mm dia. rods at 35 mm on centres running horizontally flexible connected with vertical links spaced not more than 200 mm centres. Alternatively, rolling grills shall be made from perforated slats of approved design reinforced with 6 mm dia rods. 2.1.3 End locks shall be heavy type M.C.I./C.I. and shall be provided at each end of alternate slats unless specified otherwise in the Schedule. 2.1.4 Bottom bars shall be finished with two angles not less than 6 mm thick for external shutters. When shown on drawings, a flexible weather strip shall be applied to make tight contact with the floor. 2.1.5 Guides shall be of such depth as to retain the shutter under a wind pressure of 100 Kg/Sq.M or as specified in Schedule. 2.1.6 Shafts shall be of steel pipe of sufficient size to carry the torsion load with a maximum deflection of 1/360th of span. 2.1.7 Grease packed ball bearings or bushings shall be provided for smooth trouble free operation.		

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2.1.8 2.1.9 2.1.10 2.1.11 2.1.12 2.2	Hoods shall be formed of not less than 20 gauge steel, suitable reinforced to prevent sag. Locks shall be slide bolt and hasp, or cylinder lock operable from one or both sides. Provision securing hand chain with pad-lock, provision for removable handle for hand cranks etc. shall be made as described in Schedule or as described by the Engineer. Power unit shall be suitable for 3 phase, 50 cycle, 400 volt A.C. power supply and shall be either floor or wall mounted unit. The motor shall be of sufficient capacity to move the shutter in either direction at a speed of 0.3 metres per second. In addition to the gear motor each standard power unit shall include a magnetic brake, a reversing starter with built-in overload protection, a geared limit switch and one push button station located inside the building unless otherwise stated drawing. It is desirable that the bottom bar of motor operated doors shall be provided with a sensitive edge, electrically connected to stop the travel of the door on meeting an obstruction. Operating chains shall be of tested quality, heavily galvanised and with all ends rounded to assure smooth operation and hand protection. Reduction gears shall be high strength gray cast iron, machine moulded from machine out patterns. <u>MANUALLY OPERATED SHUTTERS/GRILLS</u> Manually operated shutters shall be easily operable by one person. The speed of operation shall be about 1.3 metres per second. In general, manually operated shutters shall be push pull type for openings upto 9 Sq. metre in area. Larger shutters shall be either chain and gear operated or crank and gear operated. The crank handle shall be removable. All shutters shall be lockable from one or both sides as described as desired by the Engineer.	

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2.3	<u>POWER OPERATED SHUTTERS/GRILLS</u> These shall be operable from a push button station conveniently located beside the door or as shown on drawings. One emergency hand chain/crank operation shall also be provided for use in case of failure of the electric system. Where called for in Schedule, externally mounted shutters shall be operated by control mechanism located inside the building.	
2.4	<u>SHOP COAT</u> Shutters shall be painted with one coat of red lead or zinc chromate primer. Where specified, doors shall be galvanized and subsequently painted one coat of zinc chromate for adhesion of field coat.	
2.5	<u>ERECTION</u> Door shall be installed by the manufacturer or his authorised representative and all work shall be as per manufacturer's instructions. Any drilling or cutting to concrete, masonry etc. shall be made good after erection of shutters and all abrasion to shop coat shall be touched up. All electrical work shall be in strict accordance with the latest Indian Electricity Rules.	
3.0	<u>ACCEPTANCE CRITERIA</u>	
3.1	<u>SHOP INSPECTION</u> After completing the manufacture of the different components of the rolling shutter, an arrangement for shop inspection by the Engineer shall be made to check the conformity with approved shop drawings.	
3.2	<u>FIELD INSPECTION</u> After installing the shutters, the Contractor shall test the performance of the shutter in the presence of the Engineer. The doors shall be smoothly operable under all ambient conditions. All control and locking devices shall give fault-free performance.	

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3.3 <u>GUARANTEE</u> The Contractor shall give one year's guarantee for the successful operation of the shutters. This shall be supported by a separate and unilateral guarantee from the manufacturer of the shutters. 4.0 <u>I.S. CODE</u> (a) IS: 6248 - Metal rolling shutters and rolling grills		

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SECTION – 17

MISCELLANEOUS METAL

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1.0 SCOPE

This specification shall generally be read in conjunction with section IV and V

This shall include supply, fabrication and erection of miscellaneous metal items of light nature in gates, grills, balcony and stair handrails particulars, structural mullions and transoms, ladders hangers masonry anchors, shelf angles, anchor bolts, fasteners, etc. as shown on drawing or as instructed by the Engineer. The above items shall be of fabricated or cast M.S./Aluminium/Brass, cast iron, M.S. and galvanised M.S. Sheets, aluminium sheets, expanded metal, wire mesh etc. as shown on drawings and/or described.

2.0 INSTALLATION

2.1 FABRICATION/CASTING

2.1.1 General

All work shall be done according to approved shop drawings. All workmanship shall be equal to the best practice in modern structural or foundry shop.

2.1.2 Shop Connections

- (a) All shop connections shall be riveted or welded except when noted otherwise on drawings.
- (b) Welding of steel shall be done in accordance with the IS: 816. Use of metal arc welding for general construction in Mild Steel.
- (c) Welding of aluminium shall be done in accordance with IS: 2812, Arc welding of Aluminium and Alloys, Special care shall be taken to grind smooth all welded surface that shall remain exposed to view. Welds shall be electrically continuous if so required by the Engineer.

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2.1.3 Shop Coat Before leaving the shop, all metal work shall be thoroughly cleaned by effective means of all loose mill/ scale, rust and foreign matter. Except where encased in concrete, all steelwork shall be given one coat of approved metal protective paint, applied by brush thoroughly and evenly, well worked into joints and other open spaces. All paint shall be applied to dry surfaces. Steel work shall be galvanised or galvanized and painted with a coat of zinc chromate primer. Aluminium surfaces which shall come in contact with masonry shall be given one coat of zinc chromate primer. 2.2 <u>ERECTION</u> 2.2.1 Bracing The Contractor shall provide all necessary temporary guys and braces to ensure alignment and stability of the members and to take care of all loads to which the structure may be subjected including erection of equipment and operation of the same. 2.2.2 Temporary Bolting-Up As erection proceeds the Contractor shall plumb up and level all members and shall securely bolt up to take care of all dead load, wind load and erection stresses. Wherever piles of materials, erection equipment or other loads are carried during erection, proper provision shall be made to take care of the stresses resulting from the same. 2.2.3 Turned Bolt For field connections where bolting is specified, holes for the turned bolts may be reamed in the field, if required. All drilling or reaming for turned bolts shall be done after the parts to be connected are assembled. 2.2.4 Welding Where specified on drawings, welding shall be done in accordance with IS:		

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816 for steel and IS: 2812 for Aluminium and Alloys. 2.2.5 Cutting and Fitting No cutting of sections, flanges, webs of angles shall be done without the approval of the Engineer. Where indicated on the drawings, holes, cuttings, etc. shall be provided as required for installation, to the work by the other Contractors. No additional holes or cuttings, than those shown on drawings, shall be made without the approval of the Engineer. 2.2.6 Drifting Correction of minor misfits and a reasonable amount of reaming and cutting of excess stock from rivets may be permitted. For this, light drifting may be allowed to draw holes together. Twist drills shall be used to enlarge as necessary to make connections. Reaming that weakens the members or makes it impossible to fill the holes properly or to adjust accurately after reaming shall not be allowed. Any error in shop work which prevents the proper assembling and fitting of parts by moderate use of drift pins or a moderate amount of reaming and slight chipping and cutting shall immediately be called to the attention of the Engineer and approval of the method of correction obtained. The use of cutting torches to enlarge or alter rivet holes shall not be permitted. 2.2.7 Grouting All bearing plates, loose lintels and beams, etc. shall be set to proper grade and level by the Contractor and the Engineer's approval obtained before proceeding with the grouting. Grouting shall be done in 1:1.5:3 or 1:1- 1/2:3 concrete with 6 mm down stone chips. 2.2.8 Anchor Bolting When shown on drawings, the miscellaneous metal items shall be fixed to concrete by case hardened and drawn carbonizing steel expander nut and bolt. The Contractor shall submit the manufacturer's literature		

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showing the average pull out and average shear values for bolts of various sizes. The bolts shall be fixed strictly as per the manufacturer's instructions. 2.2.9 Pipe Joints M.S. Pipes shall be joined by threaded sockets or by welding. Cast iron pipes shall be socket and spigot jointed and caulked with hemp and molten lead. 2.2.10 Spot Painting All field rivets and bolts and also any serious abrasion to shop paint shall be spot painted with the same materials as used for the shop paint. 2.2.11 Making Good All cutting to concrete or masonry shall be made good to the satisfaction of the Engineer. 3.0 <u>ACCEPTANCE CRITERIA</u> 3.1 All items shall be of correct shape, size, weight etc. shown on drawings. 3.2 For installed items, the tolerances shall be follows : 3.2.1 Permissible deviation from straightness - 1 in 1000. 3.2.2 Seats, stiffener connections etc. Shall be as per approved drawings and shall not interfere with architectural clearances. 3.2.3 All castings shall be free from blow holes, cracks and other blemishes. 4.0 <u>I.S. CODES</u> (a) IS : 226 : Structural Steel (Standard Quality). (b) IS:800 : Code of practice for use of structural steel in general building construction..		

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(c) IS : 816 : Use of metal arc welding for general construction in mild steel. (d) IS : 2812 : Arc welding of Aluminium and Alloys. (e) IS : 3150 : Hexagonal Wire Netting. (f) IS : 4948 : Welded steel wire fabric for general use.		

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SECTION – 18

PAINTING, WHITE WASHING AND POLISHING ETC

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1.0 <u>SCOPE</u> This specification covers painting, white washing, varnishing, polishing etc. of both interior and exterior surfaces of wood work, masonry, concrete plastering, plaster or Paris, Punning false ceiling, structural and other miscellaneous steel items, rain water down comer, floor and roof drains, soil, waste and service water pipes, and other ferrous and non-ferrous metal items as shown on drawings, or as directed by the Engineer. Copper, bronze, chromium plate, nickel, stainless steel, aluminium and monel metal shall generally not be painted or finished except if otherwise specified. The painting Contractor shall inspect the work of others prior to the application of paint. If surface to be finished cannot be put in suitable condition for painting by customary preparatory methods, the painting contractor shall notify the Engineer in writing or assume responsibility for and rectify unsatisfactory finishing that results. Before commencing painting, the painting Contractor shall obtain the approval of the Engineer in writing regarding the schedule of work to minimize damage, disfiguration or staining by other trades. He shall also undertake normal precautions to prevent damage, disfiguration or staining to work of other trades or other installations. 2.0 <u>INSTALLATION</u> 2.1 <u>MATERIALS</u> Materials shall be highest grade products or well-known approved manufacture and shall be delivered to the site in original sealed containers, bearing brand name, manufacturer's name and colour shade, with labels intact and seals unbroken. All materials shall be subject to inspection, analysis and approved by the Engineer. It is desired that materials of one manufacturer only shall be used as far as possible & paint or one shade is obtained the same manufacturing batch. All paint shall be subject to analysis from random samples taken at site from painter's bucket, if so desired by the Engineer.		

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All prime coats shall be compatible to the material of the surface to be finished as well as to the finishing coats to be applied. All unspecified materials such as shellac, turpentine or linseed oil shall be of the highest quality available and shall conform to the latest IS standards. All such materials shall be made by reputable recognised manufacturers and shall be approved by the Engineer. All colours shall be as per painting schedule and tinting and matching shall be done to the satisfaction of the Engineer. In such cases, where samples are required, they shall be executed in advance with the specified materials for the approval of the Engineer. 2.1.1 White Washing Shall be done from pure shell lime or fat lime, or a mixture of both as instructed by the Engineer; and shall conform to IS:712 latest edition. Samples of lime shall be submitted to the Engineer for approval, and lime as per approved sample shall be brought to site in unslaked condition. After slaking, it shall be allowed to remain in a tank of water for two days and then stirred up with a pole, until it attains the consistency of thin cream. 100 grams of gum to 6 litres of white wash water and a little quantity of indigo or synthetic ultramarine blue shall be added to the lime. 2.1.2 Dry distemper Shall be made from suitable pigments, extenders, lime proof tinters, water soluble binders etc. and shall conform to IS:427. 2.1.3 Oil Bound Washable Distemper Shall be of oil emulsion type, containing suitable preservatives and shall conform to IS: 428. 2.1.4 Waterproof Cement Paint Shall be made from best quality white cement and lime resistant colours with accelerators, waterproofing agents and fungicides. The paint shall		

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conform to IS: 5410. 2.1.5 Acrylic Emulsion Paint Shall be water-based acrylic copolymer emulsion with rutil titanium dioxide and other selected pigments and fungicide. It shall exhibit excellent adhesion to plaster and cement surface and shall resist deterioration by alkali salts. The paint film shall allow the moisture in wall to escape without peeling or blistering. The paint, after it is dried, shall be able to withstand washing with mild and water without any deterioration in colour, or without showing flaking, blistering or peeling. 2.1.6 Synthetic Enamel Paint Shall be made from synthetic resins and drying oil with rutil titanium dioxide and other selected pigments to give a smooth, hard, durable and glossy finish to all exterior and interior surfaces. White and pastel shades shall resist yellowing and darkening with aging. The paint shall conform to IS: 2932 and IS: 2933. 2.1.7 Aluminium Paint Shall be in two pack containers and shall resist weathering. The paint shall conform to IS: 2339. 2.1.8 Shall be best quality alkyd varnish suitable for brushing over the tint of paint or light natural wood and shall not darken or yellow with age. 2.1.9 French Polish Shall be made from best quality shellac, denatured spirit and other suitable alcohol soluble ingredients and made by a well known approved manufacturer. The material shall conform to IS:348. French polish shall not be used on bare wood. It shall only be used as finishing coat on wood after the wood is pre-treated with liquid wood filler conforming to IS: 345 is applied and rubbed out.		

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2.2	<u>STORAGE</u> The Contractor shall arrange for safe and proper storage of all materials and tools. The storage space if allotted within the building shall be adequately protected from damage, disfigurement & stains. Paint shall be kept covered at all times and mixing shall be done in suitable containers. All necessary precautions shall be taken by the Contractor to prevent fire.	
2.3	<u>PREPARATION OF SURFACE</u> Before starting the work the Contractor shall obtain the approval of the Engineer regarding the soundness & readiness of the surface to be painted on.	
2.3.1	Wood All surfaces shall be free from dirt and loose or peeling paints. The surface shall be rubbed down smooth. All nails & screws shall be sunk below the surface and filled with putty after applying an under coat. Small knots that do not justify cutting and sap streaks shall be covered with minimum 2 coats of pure shellac coating applied thinly & extended 25 mm beyond the area. All large, loose or resinous knots shall be removed and filled with sound wood. All work shall be done as per IS: 2338.	
2.3.2	Masonry, Concrete and Plastered Surface Surface shall be free from all oil, grease, efflorescence, mildew, loose paint or other foreign and loose materials. Masonry cracks shall be cleaned out and patch filled with mortar similar to the original surface and uniformly textured. Where this type of re- surfacing may lead to the finishing paint being different in shade from the original surfaces, the resurfaces area shall be treated with minimum one coat of cement primer, which should be continued to the surrounding area for a distance of minimum 100 mm. Surface with mildew or efflorescence shall be treated as below: (a) Mildew	

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All mildewed surfaces shall be treated with an approved fungicide such as ammonia cal wash consisting of 7g of copper carbonate dissolved in 80 ml. liquor ammonia and diluted to 1 litre with water, or 2.5 percent magnesium silicofluoride solution and allowed to dry thoroughly before paint is applied. 2.3.3 Metal All metal surfaces shall be absolutely clean, dry and free from wax, grease or dried soap films. In addition, all steel and iron surfaces shall be free from rust, surfaces shall be cleaned by mechanical power tools to remove mill scales unless otherwise approved by the Engineer for exposed chemical resistant paints, surfaces shall be blast cleaned to near white metal. All galvanised iron surfaces shall be pre-treated with a compatible primer according to the manufacturer's direction. Any abrasion in shop coat shall be touched up with the same quality of paint as the original coat. 2.4 <u>APPLICATION</u> 2.4.1 General The method of application shall be as recommended by the manufacturer. In case of selection of special shades and colour (not available in standard shades) the Contractor shall mix different shades and prepare test panels of minimum size 1 meter square as per instruction of the Engineer and obtain his approval prior of application of finishing paints. Proper tools and implements shall be used. Scaffoldings if used shall be independent of the surface to be painted to avoid shade differences of the freshly repaired anchor holes. Painting shall be done by skilled labours in a workmanlike manner. All materials shall be evenly applied so as to be free of sags, runs, crawls or other defects. All coats shall be of proper consistency. In case of application by brush, no brush marks shall be visible. The brushes shall be clean and in good condition before application of paint. All priming undercoats for painting shall be applied by brush only, and rollers spray equipments etc. shall not be used.		

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No work shall be done under conditions that are unsuitable for production of good results. No painting shall be done when plastering is in progress or is drying. Application of paint, which seals the surfaces to moisture, shall only be done after the moisture on and below the surface has dried out. All coats shall be thoroughly dry before succeeding coat is applied. Coats of painting as specified are intended to cover surfaces perfectly. In case the surface is not covered properly by applying the specified number of coats, further coats shall be applied by the Contractor when so desired by the Engineer. All primers and undercoats shall be tinted to approximate the colour of the finishing coats. Finished coats shall be of exact colour and shade as per approved samples and all finish shall be uniform in colour and texture. All parts of mouldings and ornaments shall be left clean and true to finish. Painting on ferrous metal surface shall be done as per IS: 1477 (Part 1 & 2). The total dry thickness of the film should not be less than 120 micron. 2.4.2 White Washing The surface where white washing is to be applied shall be cleared of all loose materials and dirt. All holes and irregularities of the surface shall be filled up with lime putty and shall be allowed to dry up before application of the lime solution. One coat of whitewash shall consist of one stroke from top downwards, another from bottom upwards over the first stroke and another from left to right before the previous one dries up. Second coat shall be applied and in case the Engineer feels that one or more coats are required. No brush marks shall show on the finished surface. 2.4.3 Dry Distemper New plastered surface shall be allowed to dry for at least two months. New lime or lime cement plastered surface shall be washed with a solution of 1 part Vinegar to 12 parts water or 1:50 sulphuric acid solution and for		

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	24 hours after which the wall shall be thoroughly washed with clean water. For cement plastered surface, the surface shall be washed with a solution of 100 gms. Of zinc sulphate to 1 litre of water and then allowed to dry. Dry distemping shall be done as per manufacturer's instruction. In applying the distempers the brush should first be applied horizontally and immediately crossed off perpendicularly. Brushing shall not be continued too long as otherwise brush marks may result. 2.4.4 Oil bound washable distemper The distemper shall be applied after surface is primed with an alkali resistant primer, and followed by minimum two coats of oil bound washable distemper all as per Manufacturer's instruction. 2.4.5 Waterproof Cement Paint Surface to be coated with cement paint shall be washed and brushed down. As soon as the moisture has disappeared, the surface shall be given one coat of paint. Care shall be taken so that the paint does not dry out too rapidly. After 4 to 6 hours, the water shall be sprinkled over the surface to assist curing and prevent cracking. After the first coat has dried (24 to 48 hours) the second coat shall be applied in a similar manner. The finished surface shall be kept moist by occasional sprinkling with water for seven days after painting. 2.4.6 Acrylic Emulsion Paint Lime gauged cement plastered surfaces shall not be painted for at least one month after plastering. A sample patch shall be painted to check alkali reaction if so desired by the Engineer. Painting shall be strictly as per manufacturer's specification.	

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2.4.7	Synthetic Enamel Paint Shall be applied on properly prime red surface. Sub sequential coat shall not be applied till the previous coat is dry. The previous shall be lightly sand papered for better adhesion of subsequent coats.	
2.4.8	Aluminium Paint The paint, supplied in two pack containers shall be mixed and applied strictly as per manufacturer's direction. When more than one coat of paint is required or indicated, the next coat shall only be applied after the previous coat become hard dry.	
2.4.9	Clear Synthetic Varnish The paint, supplied in two pack containers shall be mixed and applied strictly as per manufacturer's direction The Varnish shall be applied on wood surface after (a) filling; (b) staining & (c) sealing operations are carried out. The application of a combination of filler and stain shall not be permitted. For the finishing coats of varnish, the surface shall be allowed to dry and be rubbed down lightly, wiped off and allowed to dry. Careful attention to cleanliness is required for varnishing. All dust and dirt shall be removed from the surface as well as from the neighbourhood. Damp atmosphere and draughts shall be avoided, and exposure to extreme heat or cold & dampness shall not be allowed. The varnish shall be applied liberally with a brush and spread evenly over a portion of the surface with light strokes to avoid frothing. It shall be allowed to flow on while the next section is being laid on excess varnish shall then be scrapped off the brush and the first section be crossed, recrossed and then laid off lightly. The varnish once it has began to set, shall not be retouched. In case of any mistake in application, the varnish shall be removed and the work started afresh. The varnish shall be minimum of two coats, with the first coat being a flattening varnish. This shall be allowed to dry hard and be flattened down,	

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before applying the next coat. Sufficient time must be allowed between coats to get a hard dry surface before next coat is applied. All work shall be as per relevant IS Code. 2.4.10 French Polish All unevenness of the surface shall be rubbed down to smoothness with sand paper and the surface shall well dusted. The pores in the wood shall be filled up with a paste of whitening in water or methylated spirit with a suitable pigment like burnt sienna or umber. After application of the filler paste, the French polish shall be applied with a pad of woollen cloth covered by a fine cloth. The pad shall be moistened with polish and rubbed hard on the surface in a series of overlapping circles so that the polish is sparingly but uniformly applied over the entire area to give an even surface. A trace of linseed oil may be used on the pad for ease of application. The surface shall be allowed to dry before further coats are applied in the same manner. To finish off, the pad shall be covered with a fresh piece of clean fine cloth, slightly dampened with methylated spirit and rubbed lightly and quickly with circular motions to leave the finished surface with a uniform texture and high gloss. 2.4.11 Chemical Resistant Paint For chemical resistant paints, epoxy, chlorinated rubber or vinyl butyl paint system shall be used manufacturer's recommendation regarding the paint system exposed to moderately severe corrosive condition and subject to acid/alkali spillage and fumes, shall be followed. 2.4.12 Epoxy coating/painting On the clean surface of concrete after properly drying of the following system is to be adopted as per manufacturers' specification: One coat of primer of following proportion to be applied over clean and dried concrete surface by brush application.		

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ARALDITE GY 250 - 100 Parts by weight

HARDENER HY 840 - 50 Parts by weight

Over the primer, the uneven surface of concrete should be filled with levelling putty as mentioned above. The cost of putty is included in the item rate without fixing prior limit to consumption of putty. Two top coats of the protective treatment to be applied over the prepared smooth surface in the following proportion.

(a)	ARALDITE GY 250	:	100 Parts by weight
(b)	HARDENER HY 830	:	45 Parts by weight
(c)	HARDENER BY 850	:	15 Parts by weight
(d)	SILICA FLOUR	:	20 Parts by weight
(e)	FLOW CONTROL AGENT	:	2 Parts by weight

Pigment may be added if desired by Engineer. The first top coat is applied over the primer and is left to reach a tack free state. At this stage, the final top coat is applied.

2.5 PROTECTION

Furniture and other movable objects, equipments, fittings and accessories shall be moved, protected and replaced upon completion of work. All stationary equipments shall be well covered so that no paint can fall on them. Work finished by other agencies shall be well protected. All protections shall be done as per instructions of the Engineer.

2.6 CLEANING UP

In addition to provisions in general conditions the Contractor shall, upon completion of painting etc. remove all marks and make good surfaces, where paint has been spilled, splashed or splattered, including all equipments, fixtures, glass, furniture, fittings etc. to the satisfaction of the Engineer.

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3.0 <u>ACCEPTANCE CRITERIA</u> 3.1 All painted surfaces shall be uniform and pleasing in appearance. 3.2 All varnished surfaces shall be of uniform texture and high glossy finish. 3.3 The colour, texture etc. shall match exactly with those of approved samples. 3.4 All stains, splashes and splatters of paints and varnishes shall be removed from surrounding surfaces. 4.0 <u>I.S. CODE</u> Important relevant IS Codes for this Sections are listed below : (a) IS:348 : Specification for French Polish (b) IS:427 : Specification for Distemper, dry colour as required. (c) IS:428 : Specification for Distemper oil emulsion, colour as required. (d) IS:1477 : Code of Practice for painting of ferrous (I&II) metal in buildings. (e) IS:2338 : Code of Practice for finishing of wood (I&II) and wood based materials. (f) IS:2339 : Specification for Aluminium Paints for general purposes in dual containers. (g) IS:2395 : Code of Practice for painting concrete, masonry and plaster surface. (h) IS:2932 : Specification for enamel, synthetic, exterior, type-I. (i) IS:5410 : Specification for cement paint, colour as required.		

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1.0 <u>SCOPE</u> This specification covers furnishing, installation, repairing, finishing, curing, testing, protection, maintenance till handing over of roof water-proofing, insulation and allied work for buildings and at locations covered under the scope of the Contract. 2.0 <u>INSTALLATION</u> 2.1 <u>GRADING UNDERBED</u> The surface to receive the underbed shall be roughened and thoroughly cleaned with wire brush and water. Oil patches if any shall be removed with detergent. The surface shall be soaked with water and all excess water removed just before laying of the underbed. The underbed shall not be laid under direct hot sun and shall be kept in shade immediately after laying so as to avoid quick loss of water from the mix and separation from the roof surface. The underbed shall be cured under water for at least 7 days. The underbed shall be laid to provide an ultimate run off gradient not less than 1 in 120 and as directed by the Engineer. Upto an average thickness of 25 mm the underbed shall usually be composed of cement and sand plaster. For higher thickness the underbed shall be made with cement concrete. The underbed shall be finished to receive the waterproofing treatment direct or insulation as the case may be the grading plaster shall be average 25mm thick maximum. It shall consist of cement and coarse sand in the ratio 1:4 nominal by volume. The same and cement shall be thoroughly mixed dry and then water added. Each batch of mix shall be consumed before the initial set starts The plaster shall be fully compacted to the desired grade in continuous operation. The surface shall be even and reasonably smooth.		

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2.2 <u>CONCRETE</u> The concrete shall be used where the sub grade is more than average 25mm thick. It shall consist of cement concrete 1:2:4 nominal mix by volume with 12mm down stone chips and coarse sand. The aggregate shall be mixed dry and minimum quantity of water shall be added to make the mix workable. The mix shall be laid to proper grade, fully consolidated and surface shall be smooth and even. 2.3 <u>INSULATION</u> The Tenderer shall along with the tender send specification of insulating materials he proposes to use and the proposed method of laying. Before bulk supply, the contractor shall send samples of insulating material to the Engineer, and after approval of the samples, the Contractor shall procure and transport the bulk material to the site. Whenever asked by the Engineer, the Contractor shall furnish test certificates from testing laboratory on the insulating and other properties of the materials. After laying the insulation the surface shall be made ready as required to receive the waterproofing treatment. If any plastering is used it shall be not leaner than 1:4 cement sand by volume and not thinner than 12mm and it shall be cured for seven days. 2.3.1 Foam Concrete This shall be of light weight foam concrete of average 75 mm thickness or as specified or as shown on drawings. This may be laid in situ in suitable panels or in precast blocks. The insulating properties shall be such that the thermal conductivity shall not exceed 0.125 Kcl m/m degree C. The weight of the insulating material shall be from 0.3 to 0.5 gm/cm. Before starting the laying of foam concrete samples shall be prepared at site and got tested for approval of the Engineer. The foam concrete laid shall be sufficiently strong to make the usual work load and standard loads expected on the roof. Any damaged portion shall be removed and replaced forthwith. Approval of the Engineer shall be taken before laying the waterproofing over the insulation.		

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While laying the foam concrete, samples from each batch of the mix shall be kept for test if so desired by the Engineer. 2.3.2 Expanded Polystyrene Blocks The expanded polystyrene block insulation shall be fire retardant quality and shall have a maximum thermal conductivity of 0.026 KCl m/m degree C. It must be strong enough to withstand without deformation the workload and standard loads expected on the roof. The Contractor shall lay the expanded polystyrene block as per manufacturer's approved specification. Only specifically experienced workers shall be used for this work. If the Engineer is not satisfied about the efficiency of the workers the Contractor shall have to secure manufacturer's supervision. Either of above items (cl. No. 2.3.1 or 2.3.2) can be adopted subject to approval of engineer. 2.4 <u>FILLETS</u> Fillets at junction of roofs and vertical walls shall be provided with the same insulating material as provided for the main roof insulation. The fillets shall be 150 mm x 150 mm in size unless otherwise shown on drawings or instructed by the Engineer. Where there is no insulation over roof slab, fillets shall be cast-in-situ cement concrete (1:2:4) nominal mix by volume. 2.5 <u>WATER PROOFING BY EPOXY RESIN BASED APPLICATION</u> Exposed surfaces of cement concrete, lime concrete or brickwork to be treated for waterproofing by the resin based application shall be thoroughly cleaned and the epoxy resin based material to be applied as directed by the manufacturer. The material shall not have any adverse effect on the surface on which it is applied and must stick to it uniformly to make a strong durable bond. It shall not be affected by short duration from fire, sun, light traffic. The application shall be resistant to growth of fungus and		

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proof against saltpetre action. If desired by the Engineer, a sample shall be prepared in advance and tested for water proofness for 48 hours under 300 mm depth of standing water. The Contractor shall arrange the demonstration by providing free the materials and labours for the application. 2.6 <u>FLASHING</u> Unless otherwise stated flashing shall be done in the same way as the water proofing except that the last layer, instead of being finished with pea- sized gravel, shall be finished with two coats of bituminous primer. The flashing shall be extended up the vertical surfaces as shown on drawing. The flashing shall end in grooves in vertical walls. The grooves shall be at least 65 mm deep and caulked with waterproof of mastic cement. The minimum overlap with horizontal roofing felt shall be 100 mm. Where specified on drawings or directed by the Engineer, metal flashing shall be provided. The metal flashing shall be done as shown on the drawings. The materials shall be 18g or 22g G.I. sheets, as specified on the drawings and/or as directed by the Engineer. 2.7 <u>ELASTROMERIC MEMBRANE</u> 2.7.1 Primer Coat It shall consist of polyurethane (P.U.) or any other equivalent material. Primer coat shall be a special blend of moisture curing urethane pre-polymers in solvent. A single coat of this primer shall be applied by brush /spray with airless pray equipment over the prepared bed as an adhesion coat with an application rate of 6-8 q.m per litre depending on the surface porosity. The primer shall be allowed to dry for a minimum period of 2 to 4 hours time before the successive finishing coats of P.U. liquid membrane are applied. In any case successive finishing coat shall be applied within 24 hours.		

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The substrate shall be properly prepared by removing all loose materials by vigorous brushings, fungal growth with proprietary fungicide as recommended. Priming coat shall not be applied to damp substrate. 2.7.2 Finishing Coats The finishing coats shall consist of two successive liquid coatings of high solid content urethane pre-polymers material to form an elastomeric membrane. Application shall be with brush or spray to form a uniform jointless elastomeric membrane. The overall dry film thickness shall be 1.5 mm subject to minimum 750 gm per sq.m per coat application rate. Each coat shall be allowed to dry for minimum 12 hours before applying the next coat. The surface should be dry and smooth before application. The coating shall be continued up the parapets/walls for minimum of 150 mm over the finished roof surface or fillet with suitable tucking into the vertical wall surface. It shall be continued into rain water pipes by at least 100 mm. The final coat of PU liquid when tacky shall be sprinkled with the sand. For edges, expansion joints and any vulnerable points a layer of polyscrim cloth/fabric are to be embedded between 2 finishing coats. The entire work shall be carried out under the supervision of approved authorized agency. 2.7.3 Surface Finish Areas of roof treatment shall be provided with wearing course consisting of minimum 25 mm thick PCC 1:11/2:3 (using 12.5 mm size aggregate) cast in panel of maximum size of 1.20 m x 1.20 m and reinforced with 0.56 mm diameter galvanized chicken wire mesh and sealing of joints using sealant or elastomeric compound.		

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When the roof surface is subjected to foot traffic or used as a working area, a cement mortar (1:4) shall be applied over the top most layer of roofing treatment. Over this, a layer of chequered cement concrete flooring tiles conforming to IS:13801 shall be provided. The tiles shall be laid as per IS1443. 2.8 <u>WATERPROOFING WITH APP MODIFIED BITUMINOUS MEMBRANE</u> The RCC roof waterproofing with pre-fabricated APP (atactic polypropylene) modified waterproofing membrane with non woven polyester reinforcement treatment of 4 mm thickness, consisting 160 gsm high Molecular high- density non-woven polyester core, coated on both sides with APP modified bitumen which shall have high penetration, high heat resistance and high softening point. It should also achieve good bonding with substrate and a strong adhesion between overlaps. This polymeric Asphaltic mix shall be protected on the bottom with thermo fusible HMHDPE film, on the top with another layer of HMHDPE. The resultant membrane shall have very good elongation to absorb all structural movements. The cement sand plastered surface on foam concrete is first cleaned to eliminate all sharp projections. Suitable bituminous primer @ 0.27L/SQ.M. (IS:3384) is then coated on the surface. APP modified water proofing roll is unrolled over coated surface is first cleaned (with overlaps of 10cm) and bonded completely to the substrata. The overlaps & complete bottom are then thermo-fused by flame. Special care is taken at singularities such as drains , expansion joints etc. 2.9 <u>SURFACE FINISH</u> 18 mm thick cement sand mortar (1:4) with chicken wire mesh interposed shall be laid over water proofing treatment. Over this, a layer of chequered cement concrete flooring tiles conforming to IS:13801 shall be provided .The tiles shall be laid as per IS :1443. 3.0 <u>ACCEPTANCE CRITERIA</u> The surface level shall be such as to allow quick draining of rains without leaving any pool anywhere. The finishing course shall be fully secured and shall have an even density. There shall not be any bubble formation or		

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crushed or squeezed insulation or underbed. The Contractor shall give a guarantee in writing for all work executed under this specification supplemented by a separate and unilateral guarantee from the specified agency for the roof water-proofing treatment work. The guarantee shall be for materials and workmanship for a period of minimum 10 years. The mode of execution of the guarantee shall be acceptable to the Owner. 4.0 <u>I.S. CODES AND STANDARDS</u> (a) IS:73 : Paving Bitumen (b) IS:702 : Industrial Bitumen (c) IS:1203 : Methods of testing tar and bitumen (d) IS:1322 : Bitumen felts for waterproofing and damp proofing (e) IS:1346 : Code of Practice for waterproofing of roofs with Paving Bitumen (f) IS:3384 : Bitumen primer for use in waterproofing and damp proofing		

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1.0 <u>GENERAL</u> 1.1 <u>DESCRIPTION</u> 1.1.1 Work included: This section covers the furnishing and installation of sandwich/double skin/single skin metal cladding with insulation for wall/roof as shown in contract drawings including making cut outs for various openings for doors, windows, ducts, pipes etc and fixing of such components with the cladding arrangement with necessary flashing, sealant as required as per contract drawings. The contractor shall furnish all labour, materials, tools and equipment required to complete the work. 1.2 <u>APPLICABLE CODES AND STANDARDS</u> 1.2.1 The following codes and standards are intended to provide an acceptable level of quality for materials and products. The contractor may propose alternative codes and standards provided they give an equivalent degree of quality as the referred codes and standards and are submitted for consultants/owner's approval. 1.2.2 ASTM - American Society for Testing Materials. (a) A446 Zinc-coated (Galvanized) steel sheets of structural quality Coils and cut lengths (b) A611 Steel, cold rolled sheet 1.3 <u>SUBMITTALS</u> 1.3.1 The contractor shall submit to the owner the following items for review before commencing work. (a) Samples (i) Three 300 x 300 mm pieces of each type of precoated and preformed metal sheet for top skin and bottom skin.		

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(ii) Three 300 x 300 mm pieces of each type of precoated and preformed metal sheet (iii) Type of insulation proposed for use and its thickness. (iv) Fabricated sandwich metal cladding. Sample size shall be 300 x 300 mm three nos. (v) Edge sealing and flashing. (b) Manufacturer's literature indicating the nature of preformed profiled, colour coating, manufacturer's recommended installation, instructions and maintenance procedure. (c) Manufacturer's certification of compliance with each delivery. (d) Shop Drawings Showing fabrication details of sandwich/double skin/single skin metal cladding with Insulation, preformed sheet profile and total colour thickness for profiled top skin and slightly ribbed bottom skin, thickness and nature of insulation, installation and erection, anchorage, fasteners and details of accessories, metal flashing and its fixing including various openings for doors, windows, louvres, pipes etc. 1.3.2 Test Reports Two copies of Test Reports and Source of Quality Control Tests. 1.3.3 Supplier Certificates Two copies of technical data showing that the proposed finish product is suitable for the environmental conditions of the job site and that the materials meet specification requirements.		

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1.4 <u>PRODUCT HANDLING</u> 1.4.1 Delivery of Materials to job site in manufacturer's original unopened packaging. 1.4.2 Identify contents with name of manufacturer, brand name, thermal value and applicable standard. 1.4.3 Store materials in an area protected from adverse climatic conditions, moisture and open flame or spark and shall be stored off the ground with one end elevated for drainage. The sheets shall be protected from inclement weather with a waterproof covering with ventilation to avoid condensation. 2.0 <u>PRODUCTS</u> 2.1 <u>GENERAL</u> 2.1.1 All goods and products covered by these specifications shall be procured from manufacturer duly approved by the owner. 2.1.2 Cladding material shall be of "Rib and Flute" design to ensure wide spanning and quick recovery after being subjected to excessive load. Single skin materials shall be interlocking type 150mm wide strip. 2.1.3 Material shall be prefabricated panel shall be conformed to relevant ASTM or alternative codes and standard. Troughed galvanized M.S. sheets having 0.6 mm minimum base metal thickness (bare material) with minimum rate of galvanization of 275 gms./sq.m. as per IS-277 of minimum yield strength of 250MPa as per IS-513(or High tensile steel sheet coated with zinc aluminium alloy @ 150 gms./sq.m. of 0.5 mm minimum base metal thickness and having minimum yield strength of 350 MPa, as per AS-1397) shall be used for the cladding system. 2.1.4 The outer side (exposed face) shall be permanently colour coated with Silicon modified polyester paint of minimum DFT 20 microns over primer, of approved colour/shade and the inner side (internal face) shall be coated with same paint of minimum DFT 20 microns over primer of off-white shade		

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2.1.5 Roof insulation shall have a minimum R-value of 2.083 M² °K/Watt. Thickness of sandwich cladding shall be as required to meet the specified “R” values. 2.1.6 Sandwich material shall be of “Rib and Flute” design to ensure wide spanning and quick recovery after being subjected to excessive load. Double skin materials shall be interlocking type 150mm wide strip and inner sheet shall be mild rib & flute type profile to ensure quick recovery after being subjected to excessive load. 2.1.7 Material (a) Base Material : High tensile steel (b) Metal protection : Galvalume (c) Organic coating : SiliconModified Polyester (SMP) Fluoro polymer (PVF2) and plastisols to resist aggressive climate of the jobsite. 2.1.8 Material shall be prefabricated sandwich panel with polystyrene insulation /high density rock wool slab insulation shall be conformed to relevant ASTM or alternative codes and standard. Insulation shall be bonded to steel sheet with industrial grade adhesive. Sheeting material shall be preformed and precoated profile sheeting of thickness 0.60 mm or as recommended by manufacturer to resist the climate of the jobsite for Top skin (Weather side) and Bottom skin or inner side slightly ribbed type and minimum 0.5 mm thick or as recommended by manufacturer of similar pre coated panel 2.1.9 Insulating core shall vary from 25 mm to 100 mm thick according to the climatic requirement of the site and shall be either polystyrene block or rock wool slab made to profile of the sheet. The maximum density shall be 32.35 Kg/ M³ for polystyrene and shall have minimum R-value 2.083 M² °K/Watt.		

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2.1.10 Panel size shall be largest available size. 2.1.11 Warranty for precoated profiled metal sandwich /double skin cladding shall be for a minimum period of 40 years. 2.1.12 Sealants Penetration and end laps in sheeting shall be sealed with a non-hardening approved sealant as recommended by the manufacturer. 2.1.13 Profile HDPE Filler (a) Profile HDPE Filler shall be die cut in profile to match the profile of the sheet. (b) Metal flashing shall be of similar material and colour of top skin. 3.0 <u>DOUBLE SKIN INSULATED METAL CLADDING</u> 3.1 <u>GENERAL</u> 3.1.1 Metal cladding may be of double skin separated by an approved insulation in between. External sheet shall be of interlocking type. 3.1.2 Double skin wall cladding shall be comprising of 150F external panels manufactured out of 0.6 mm TCT (Total coated thickness) aluminium alloy AA3105/5050 with stove enamelled coil coated finish, sufficient to withstand most aggressive climate, on both sides of approved shade. The 150mm wide panels (150F) shall be clipped on to the concealed runners and shall be interlocked with each other. The inner sheeting shall be Hi Rib 0.5mm TCT silicon modified polyester coated galvalume steel (AZ 150 gsm aluminium- Zinc alloy meta metallic coating of total 550 Mpa yield stress as per AS-1397). The external panels shall be 150mm wide 17mm deep. The inner sheet shall have 1000-1020 mm cover width 28-30 mm high crests @250-255mm c/c with side laps. The inner sheet shall be fixed to structural system by means of corrosion protected self-drilling, self-tapping fasteners. The sub girts of size 50mmx50mmx50mm manufactured out of 16 G G.I (1.6mm) 'Z' shape shall be fixed to inner sheeting on face side at purline		

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locations. The external panels shall be fixed with the help of concealed runners 34.5 wide x48mm deep out of 0.95 mm thick aluminium strip with cut outs to hold the panels in a module of 150mm at 1600mm c/c and fastened on side girts. The runners shall be concealed and no fasteners are to penetrate the panels. An insulation of 50mm thick resin bonded fiberglass roll insulation of density 16kg/m³ shall be fixed in the cavity between two sheets. Contractor shall make cut out of doors, windows, louvres, pipe, ducts or other cut outs as required as per contract drawings along with flashing, leak proof sealing etc as required for these cut outs/wall openings. 4.0 <u>EXECUTION</u> 4.1 <u>INSPECTION</u> 4.1.1 The contractor shall examine the area, which will be covered, and the masonry wall where the edge of the sandwich/double skin/single skin cladding will be fixed and the structural alignments. 4.1.2 Contractor shall correct any unsatisfactory conditions prior to start of work. 4.2 <u>INSTALLATION</u> 4.2.1 Sandwich / metal permanently coated panel shall be fixed over structural members with joints overlapped and fastened using stainless steel fasteners self-drilling type or as recommended by the manufacturer. 4.2.2 Double skin /single skin wall cladding shall be installed strictly as per manufacturer specification and details. 4.2.3 All end laps of profiled sheeting and joints of flashing shall be sealed properly with non-hardening natural cure silicon sealant or as recommended by the manufacturer. 4.2.4 Accessories like fasteners, tape, and foam fillers, flashing etc. as required shall be provided as per recommendation of manufacturer. 4.2.5 The external panels shall be fixed with the help of concealed runners aluminium strip with cut outs to hold the panels and fastened on side girts. The runners shall be concealed and no fasteners are to penetrate the panels.		

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4.2.6 Contractor shall make cut out of doors, windows, louvres, pipe, ducts or other cut outs as required as per contract drawings along with flashing, leak proof sealing etc as required for these cut outs/wall openings. 4.3 <u>CLEAN-UP</u> Remove sealant splatters and smears remove steel particles generated by drilling to avoid damage.		

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1.0 <u>SCOPE</u> This section includes supply of all materials, labour and incidentals for water supply for residential, business and industrial and other types of buildings. The water supply system of a building or premises covers service pipes and the necessary connecting pipes, fittings, control valves and all appurtenances in or adjacent to the building or premises. 1.1 <u>MATERIALS</u> All materials, fittings, fixtures and appliances shall be of the best quality conforming to relevant Indian Standard and shall be procured from approved manufacturers. Unless specifically allowed by the Engineer, the Contractor shall submit samples of fittings and fixtures which will be retained by him for comparison when bulk supplies are received at the site. Ultimate choice of type, model and manufacturer lies completely with the Engineer. It shall be the responsibility of the Contractor to procure the materials selected by the Engineer. Hence order is to be placed with the manufacturers in time, so that the materials are available at the site well ahead of their requirement. The materials brought to the site, shall be stored in a separate secured enclosure away from the building materials. Pipe threads, sockets and similar items shall be specially protected till final installation. Brass and other expensive items shall be kept under lock and key. Fragile items shall be checked thoroughly when received at the site and items found damaged shall not be retained at the site. 1.2 <u>PIPES AND PIPE FITTINGS</u> Under scope of this specification, pipes and pipe fittings may be any or a combination of the following types : (a) Cast Iron (b) Steel: lined, coated with bituminous composition, out coated with		

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cement concrete or mortar or galvanised. (c) Reinforced Concrete (d) Priestesses Concrete (e) Lead (Not to be used for potable water) (f) P. V. C. (g) Copper (h) Brass (i) Wrought iron 1.3 <u>WATER RESERVOIRS</u> Water reservoirs like pressed steel tanks and G.I. tanks shall come under scope of this specification. Reservoirs made of concrete masonry or fabricated steel shall be covered by respective work specifications. 1.4 <u>RELATED WORKS</u> All works, like earthwork, masonry, concrete, steelwork, cutting holes, chases, repairs and rectification associated directly with installation of water supply systems shall come under scope of the Contractor unless specifically excluded. 1.5 <u>REGULATION</u> The work which is required to be carried out under the scope of this section, shall be executed by a licensed plumber only (engaged by the Contractor) and he shall obtain all necessary sanctions, permissions, certificates etc. from Municipal and/or other Local Authorities and shall abide by all the rules of such Authorities.		

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2.0 <u>INSTALLATION</u> While basic layouts may be available in the drawings provided by the Owner, the details might have to be supplemented by the Contractor for approval of the Engineer. Special attention shall be given by the Contractor to economy. Symmetry of layout is very important. Fittings meant for operation shall be located and oriented to allow easy reach and operation. Maintenance, repairs and replacements of pipes, fittings and fixtures must be conveniently possible. 2.1 <u>PIPE LINES</u> 2.1.1 Laying In addition to fulfilling the functional requirements all pipelines shall be laid true to line, plumb and level. Any deviation shall need approval of the Engineer. Meticulous care shall be taken to avoid chances of airlock and water hammer. Pipes shall be laid on continuous unyielding surface or on reliable supports at least one near each joint and spacing as directed by the Engineer. The support must be strong, neat and shall have provisions for securing the pipes in every direction and easy maintenance. Pipes shall be encased or concealed in masonry or concrete if shown on drawing or directed by the Engineer. 2.1.2 Back Flow The layout of pipe work shall be such that there is no possibility of back flow towards the source of supply from any cistern or appliances, whether by siphonage or otherwise. All pipe works shall be so laid or fixed and maintained as to be and to remain completely water-tight, thereby avoiding waste of water, damage of property and the risk of contamination of the water conveyed.		

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2.1.3 Contamination There shall be no cross connection whatsoever between a pipe or fitting for conveying or containing wholesome water and a pipe or fitting for containing impure water or water liable to contamination or of uncertain quality of water which has been used for any purpose. No piping shall be laid or fixed so as to pass into or through any sewer, scour outlet or drain or any manhole connected therewith. 2.1.4 Underground Pipings Underground piping shall be laid at such a depth that it is not likely to be damaged by traffic and other loads and frost, where applicable. The size and depth of the trench shall be as approved by the Engineer. Back-filling shall be done with selected fine earth, unless otherwise permitted in 150 mm layers and carefully consolidated. Special care shall be taken while filling in the vicinity of the pipe to avoid damage. Before backfilling the laid pipe shall be fully tested and approved. Where the pipe rests on rock it may be bedded on a layer of fine selected material or concrete to avoid local point support. The trench shall be so treated by gradient and filling in the area that it does not act as a drainage channel. 2.1.5 Concealed Piping Where desired by the Engineer or shown on the drawings the pipes shall be concealed in masonry or concrete of the structure. The Contractor may co-ordinate with the building Contractor for leaving the chases, openings, conduits as necessary. However, the Contractor will rectify if required the chases, openings and conduits, supplement and make good after laying and testing of the concealed pipelines.		

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2.1.6 Jointing of Pipes Jointing of pipes shall be completely leakproof and durable. Instruction of them manufacturer shall be followed unless desired otherwise by the Engineer. However, usually recommended practices are stated below for guidance: (a) Cast Iron (i) Spigot and Socket Joints Lead joint : The joint is made by first caulking in clean spun yarn upto half depth and filling the reminder by running in molten lead taking care that no dross enters the joint and then thoroughly caulking the lead. The lead need not extend into the joint further than the back of the groove formed in the socket. After completing the joint it shall not be allowed to move. For rectification the joint shall be completely redone. (ii) Flanged Joints : Flanged joints shall be made by jointing rings of good quality, smooth and hard compressed fibre board of thickness not less than 1.5 mm and of such width as to fit inside the circle of bolt. Diagonally opposite bolts shall be tightened in pairs and in stages so that degree of all bolts in a joint are similar. Damaged gaskets shall be replaced. (b) Steel Plain ended steel pipes may be jointed by welding. Screwed and socketed joints shall be carefully tightened. Care shall be taken to remove any burr from the ends of the pipes. Jointing compound, if used, shall be lead free and approved by the Engineer. Once a joint has been screwed up it shall not be backed off unless threads are reclined and new compound applied.		

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(c) GI Pipes Threads shall be cut with sharp tools, and before jointing all scales shall be removed from pipes by suitable means. The screw / threads of the pipe shall be cleaned out and the joint made by screwing the fittings after treating the threads with approved pipe jointing compound. Once a joint has been screwed up it shall not be backed off unless threads are recleaned and new compound applied. (d) Lead Lead and lead alloy pipes shall be jointed with wiped solder joints. (e) Concrete Concrete pipes may be socket and spigot ended collar or band jointed. Joints shall be effected by caulking with 1:3 cement sand mortar. (f) P. V. C. Manufacturer's instruction shall be followed. For heating approved equipment with adequate control shall be used. (g) Tyton Joint The manufacturer's instruction shall be strictly followed in making such joints. Tyton joints shall be made by push-on type specification stipulated by the pipe manufacturer. The tools specified by the pipe manufacturer shall be used to secure the joint fully. 2.1.7 Painting Where mentioned in the Schedule, underground steel and cast iron pipes shall be given 2 coats of bituminous paint on the outside after laying, when painting is to be done above ground G.I. pipes shall be given a coat of zinc chromate primer, C.I. and M.S. pipes shall be given one coat of red lead		

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or zinc chromate primer. Top coats shall be minimum 2 coats of best quality paint. 2.2 <u>STORAGE TANK - PRESSED STEEL TANK</u> Unless otherwise mentioned, water storage tanks shall be pressed steel tanks of nominal size and capacity as mentioned in the Schedule and fabricated with all flanges external, all flanges internal, or bottom flange internal and side flanges external, as shown on drawings or schedule of items. The fabricator shall supply 6 prints of fabrication drawings to the Engineer for prior approval showing thickness of plates, method of jointing the plates, all supports, stays, gussets etc. Pads, cleats etc. required for supporting the tanks shall be supplied by the manufacturer. Inlet, overflow vent pipes, manholes etc. shall be arranged and provided as shown on \ drawing or mentioned in the schedule. Unless otherwise specified, the outlet pipe shall be 50 mm above the bottom of the tank and there shall be a 150 mm free board at the top of the tank. All tanks shall be supplied with mosquito-proof covered top with manhole not less than 450 mm diameter. Tanks deeper than 1.00 Metre shall be provided with m.s. Internal access ladder adjacent to the manhole. Water level indicator shall be provided if asked for. Two coats of anti-corrosive paint over a suitable primer shall be applied to both internal and external surface of tanks. Such paint if used shall not impart any taste or odour to water and be of lead free composition. Erection of tanks shall be in accordance with detailed drawings and manufacturer's instructions. The two finishing coats of paint shall be applied to outside after erecting is complete. 2.2.1 G. I. Water Tank G. I. water tanks shall be procured from a reputed manufacturer. The design shall be good enough to withstand the loads safely. Galvanised iron water storage tank shall be made of minimum 2 mm thick galvanised iron sheet. Plain sheets shall be fixed at the corner to angle iron frames by means 6 mm rivets at 40 mm pitch for tanks upto 1000 litres capacity and 8 mm rivets at 35 mm pitch for tanks above 1000 litres capacity. Tanks above 1000 litres shall have 20 mm dia. galvanised / iron stay rods, one fixed to		

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angle framing at top and two in the body of the tank for extra strength. Holes for riveting shall be drilled and not punched. White lead shall be applied to the joints before riveting. In case it is desired by the Engineer that corners of tank should be welded instead of riveted then the sheets shall be welded to form a tank will not have angle iron frame. Tanks shall have 400 mm dia. holes at the top with hinged covers. The covers shall be made of galvanised iron sheet with angle iron frame. The cover shall be just loose but close fitting to keep out dust and mosquito and will not be airtight. It shall be complete with lockable arrangement. Tanks shall be provided with rising main inlets of 40 mm dia. galvanised iron pipe or as shown on Drawing and 25 mm dia. G.I. overflow pipe. The rising main shall be connected to the tank with a ball valve near the top which disconnects the supply when tank is full up to the point of overflowing. The ball valve permits the entry of water when the tank is empty and disconnects the supply when the tank is full. It consists of a hollow floating ball made of copper, plastic or hand Tubers, 110 mm in diameter, attached to an arm which is so pivoted that the end near the pivot closes the orifice of the main when the ball is raised to the required height of water in the tank and opens the main as soon as the ball drops with the fall of water level as it is drawn off through the distribution pipes. The ball valve shall be fixed to the tank independent of the inlet pipe and set in such a position that the body of the ball valve cannot submerge when the tank is full upto the water line. The ball valve shall be so adjusted as to limit the level of the water line. The level of the water in the tank to 75 mm below the lip of the overflow pipe. Free surface shall be about 150 mm above the maximum water filled level. 2.3 <u>VALVE, COCKS, TAPS</u> All valves, stop cocks, taps etc. shall conform to relevant Indian Standard Specification and shall be of best quality from approved manufacturers.		

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These shall be suitable for working pressures mentioned in the Schedule. Nominal size and material shall be as per schedule. 2.4 <u>PROTECTION</u> Open end of each pipe shall be protected during installation by suitable covers or plugs so that the ends, threads, sockets or spigot are not damaged and no foreign material can find its way into the pipe line. Fittings and fixtures liable to be misused or stolen during the construction phase shall be fitted only before testing and handing over. 3.0 <u>TESTING AND ACCEPTANCE</u> 3.1 <u>INSPECTION BEFORE INSTALLATION</u> All pipes, fittings and appliance shall be inspected, before delivery at the site to see whether they conform to accepted standards. The pipes and fittings shall be inspected on site before laying and shall be sounded to disclose cracks. Any defective items shall be clearly marked as rejected and forthwith removed from the site. 3.2 <u>TESTING OF MAINS AFTER LAYING</u> After laying and jointing, the main shall be slowly and carefully charged with water, so that all air is expelled from the main by providing a 25 mm inlet with a stop cock, allowed to stand full of water for a few days if time permits, and then tested under pressure. The test pressure shall be 5 Kg/CM² or double the maximum working pressure, whichever is greater. The pressure shall be applied by means of a manually operated test pump, or in the case of long mains or mains of a large diameter, by a power driven test pump, provided that the pump is not left unattached. In either case due precaution shall be taken to ensure that the required test pressure is not exceeded. Pressure gauges shall be accurate and shall preferably have been recalibrated before the test. The pump having been stopped, the test pressure shall maintain itself without measurable less for at least five minutes. The end of the main shall be closed by fitting a water-tight expanding plug and the plug shall be secured by struts to resist the end thrust of the water pressure in the mains.		

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3.3 <u>TESTING OF SERVICE PIPES AND FITTINGS</u> The service pipes shall be slowly and carefully charged with water allowing all air to escape avoiding all shock or water hammer. The service pipe shall then be inspected under working conditions of pressure and flow. When all draw-off taps are closed, the service pipes shall be absolutely water-tight. All piping, fittings and appliances shall be checked for satisfactory support and protection from damage, corrosion and frost. 4.0 <u>I.S. CODES</u> Important relevant IS Codes for this Specification are listed below : Latest editions shall always be consulted. (a) IS:2065 : Code for Practice for water supply in buildings (b) IS:1172 : Code of basic requirements for water supply, drainage & sanitation (c) IS:1200 : Laying of water and sewer lines including appurtenant items. (Pt. XVI) (d) IS:1239 : Specification for Mild Steel Tubes and Mild Steel Tubulars and other wrought steel pipe fittings (10 mm to 15 mm nominal diameter) (Pt. I & II) (e) IS:1536 : Specification for Centrifugally cast (Spun) iron pressure pipes for water gas and sewage (f) IS:1537 : Specification for vertically cast iron pressure pipes for water, gas and sewage. (g) IS:3486 : Specification for Cast iron spigot and socket drain pipes (80 mm to 250 nominal diameter) (h) IS:3589 : Specification for Electrically welded steel pipe for water, gas and sewage (200 mm to 2000 mm nominal diameter) (i) IS:784 : Prestressed concrete pipes		

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(j) IS:458 : Concrete pipes (with or without reinforcement) (k) IS:783 : Code of Practice for laying of concrete pipes (l) IS:1592 : Asbestos cement pressure pipes (m) IS:1626 : Asbestos cement pressure pipes, gutters and fittings (Spigot and Socket types) (n) IS:404 : Lead pipes (o) IS:3076 : Low density polyethylene pipes for potable water supplies (p) IS:4984 : High density polyethylene pipes for potable water supplies (q) IS:2501 : Copper tubes for general engineering purposes (r) IS:407 : Brass tubes for general purposes (s) IS:1230 : Cast iron rain water pipes and fittings (t) IS:804 : Rectangular pressed steel tanks		

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1.0 <u>SCOPE</u> 1.1 This section covers the layout and construction of drains for roof water, surface water and sewage together with all fittings and fixtures and inclusive of ancillary works, such as connections, manholes and inspection chambers used within the building and from the building to the connection to a public sewer or to treatment work, septic tank and soak pit dispersion trenches. 2.0 <u>INSTALLATION</u> 2.1 <u>GENERAL</u> All pipe lines, locations of fittings and fixtures, etc. shall be as per drawings or as directed by the Engineer. Correctness of lines, plumb, orientation, symmetry and levels shall be strictly ensured. All items shall be fully secured against movement in any direction and so located as to allow easy maintenance. All pipe lines, fittings and fixtures shall be installed leak proof. When the works under scope of this specification linked up with works executed by others, the connections shall be such as to prevent any splashing or spilling or emission of foul odour and gases. 2.2 <u>RAINWATER DOWNCOMERS</u> Rainwater down comers shall be standard Cast Iron Pipes. In case where specifically desired, M.S. pipes may also be used. M.S. pipes shall be painted outside with two coats of anticorrosive paints under a coat of primer. Rainwater downcomers shall run along and be secured to walls, columns etc. where desired by the Engineer these may have to be installed in chases cut in the structure All pipes shall be well secured and supported by adequately strong brackets.		

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The brackets may be wrought iron clevis type, split ring type or perforated strap iron type as approved by the Engineer. For vertical runs each pipe shall hang freely on its brackets fixed just below the socket. Suitable spacer blocks shall be provided against the vertical surface to which the pipe is fixed. All bends and junctions shall be supplied with watertight cleanouts. Roof and floor drains and yard gullies shall be installed, if required, by cutting into the structure and grouted with 1:2:4 cement concrete. All gutters shall be provided with removable gratings. All horizontal pipes shall have a minimum fall of 1 in 100. 2.3 <u>GUTTERS</u> The gutters shall be made of G.I. All gutters shall be supplied by reputable specialised firms. Each section shall be sufficiently rigid, edges and corners straight and the slopes perfectly uniform. G.I. gutters shall have the edges strengthened by suitable means. Unless noted otherwise the gutters shall have a minimum fall of 1 in 120. Adequate number of string supports shall be provided so that there is no reflection even when the gutter is full. Each joint must have a support. Unless otherwise specified the supports shall be fabricated M.S. brackets. All junctions shall be thoroughly watertight. The joints may be made by rivetting, bolting or soldering. All joints between successive lengths of gutters shall have an overlap of at least 5 cm. The drop in the overlap shall always be in the direction of the fall of the gutter. Ends of gutters shall be closed watertight. Junction with rainwater down comers shall be made fully watertight and secured. 2.4 <u>SOIL AND DRAINAGE PIPES</u> 2.4.1 Gradients If not specified the minimum gradients of soil and drainage pipe line shall be as follows.		

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(a) 100 mm nominal dia : 1 in 35 (b) 150 mm nominal dia : 1 in 65 (c) 230 mm nominal dia : 1 in 120 (d) 300 mm nominal dia 1 in 200 2.4.2 Relation with water supply pipe lines Unless specifically cleared by the Engineer, under no circumstances shall special drainage and soil pipes be allowed to come close to water supply pipelines. 2.4.3 Laying Each separate pipe shall be individually set for line and for level. Where lengths of sewer or drain pipes are laid in trench, properly painted sight rails shall be fixed across the trench at a height, equal to length of the boning rod to be used, above the required invert level of the drain or sewer at the point where the sight is fixed. More sight rails shall be required at manholes, change of gradient and intermediate positions if the distance for sighting is more than 50 ft. apart. The excavation shall be boned in at least once in every 6 ft. The foot of the boning rod shall be set on a block of wood of the exact, thickness of the wall of the pipe. Each pipe shall be separately and accurately boned between sight rails. 2.4.4 Support and Protection on Pipelines All pipes shall be laid with sockets leading uphill. Preferably the pipe shall rest on solid and even foundations for the full length of the barrel. However, the pipe manufacturer's instruction as approved by the Engineer shall be followed in the matter of support and jointing. To achieve full and continuous support, concrete for bedding and packing is the best. Where pipes are not bedded on concrete, the floor shall be left slightly high and carefully placed so that the pipe barrels rest on undisturbed ground. If anywhere the excavation has been carried too low		

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packing shall be done in concrete. Where laid on rock or very hard ground which cannot be easily excavated to a smooth surface, the pipes shall be laid on a cradle of fine concrete floor of gravel and crushed stone overlaid with concrete or on a well consolidated gravel and crushed stone bed as desired by the Engineer. PVC or similar pipes shall be laid directly on stable soil and packed with selected soil. The minimum support and protection for glazed stoneware pipes shall be as follows: - When cover is less than 2 metre below ground level and where pipes are unavoidably exposed above ground surface, the pipes shall be completely encased or surrounded with concrete. - Where pipes are laid on soft soil with the maximum water table laying at the invert of the pipe, the sewer shall be bedded on concrete. - Where the pipes have to be laid on soft soil with the maximum water table rising above the invert of the pipe, but below the top of the barrel, the pipe sewer shall be haunched. - Where maximum water table is likely to rise above the top of the barrel or wherever the pipe is laid on soft soil the pipe sewers shall be completely encased or surrounded with concrete. Cast iron pipes and concrete pipes may be supported on suitable concrete or brick support, where specified. The supports shall be unyielding and strong enough. At least one support shall be located close to ends. Spacing of intermediate supports shall be as decided by the Engineer. Pipes shall be secured to the supports by approved means. Anchoring of pipes where necessary shall be achieved by suitable concrete encasing designed for the expected thrust. 2.4.5 Entry into structures For entry of the pipe lines into any building of structure suitable conduits under the structure or sleeves shall be used. The conduits and sleeves shall		

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be such as to allow easy repairs and replacement of the pipes. When openings or chases are required to be made in the structure for entry of pipe lines, locations and sizes shall be marked and checked by the Engineer. After laying of the pipeline the openings and chases shall be mended.		
2.4.6	Ducts	
Where solid, waste and ventilating pipes are accommodated in ducts, access to cleaning areas shall be provided. Connection to drain shall be through a gully with sealed cover to guard against ingress of sewer gas, vermin or backflow.		
2.4.7	Traps and Ventilating Pipes	
Pipes are carrying off the waste from water closets and waste water and overflow water from baths, wash basins, sinks to drains shall be trapped immediately beneath such fixtures. Traps shall have minimum water seal of 50 mm and shall be ventilated whenever such ventilation is necessary to maintain water seal of the trap.		
Ventilating pipes shall be carried up vertically from the drain to a height of at least 600 mm above the outer covering of the roof of the building or as shown on drawings. All vertical ventilating, anti-syphonage and similar pipe shall be covered on top with a cowl. The cowl shall be made of C.I. unless desired otherwise by the Engineer.		
2.4.8	Manhole and Inspection Chambers	
The maximum distance between manholes shall be 30 meter unless specially permitted otherwise. In addition, at every change of alignment gradient or diameter there shall be a manhole or inspection chamber. The distance between manhole or inspection chamber and gull chamber shall not exceed 6 metre unless desired otherwise.		
Manhole shall be constructed so as to be watertight under test. The bending at the sides shall be carried out in such a manner as to provide no lodgement for any splashings in case of accidental flashing of the chamber. The channel or drain at the bottom of chamber shall be plastered with 1:2 cement, sand mortar and finished smooth to the grade. The channels and drains		

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shall be shaped and laid to provide smooth flow. Connecting to existing sewer lines shall be through a manhole. Manholes shall be provided with standard C.I. covers. The covers shall be close fittings so as to prevent gases from coming out. Suitable heavy duty covers shall be used where necessary as decided by the Engineer. 2.4.9 Cutting of Pipes Manufacturer's instructions shall be followed for cutting of pipes where necessary. Suitable and approved tools shall be used for the cutting so as to leave surface clean and square to the axis of the pipe. 2.4.10 Jointing Jointing of laid pipes shall be so planned as to avoid completely any movement or strain to the joints already made. If any joint is suspected to be damaged it shall be opened out and redone. with the floor. Rod holes made in the channel up to the ground level 150 mm apart and the chemical emulsion poured along the channel at the rate of 7.5 litres per square meter of the vertical wall or column surface. The soil should be tamped back into place after this operation. All joints between pipes, pipes and fittings and manholes shall be gas-tight when above ground and water-tight when underground. Method of jointing shall be as per instructions of the pipe and fittings manufacturer and as approved by the Engineer. However, in the absence of any instruction available from the manufacturer the methods as detailed hereunder shall be used. (a) Cast Iron Pipes Socket and spigot pipes shall be jointed by the cast lead joints. The spigot shall be centered in the socket of the next pipe by tightly caulking in sufficient turns of tarred gasket or hemp yarn to have unfilled half the depth of socket. When the gasket or hemp yarn has been caulked tightly a jointing shall be placed round the barrel and tightened against the face of the socket to prevent airlock.		

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Molten lead shall then be poured in to fill the remainder of the socket and caulked with suitable tools right round the joint to make up for shrinkage of the molten metal on cooling and shall be finished 3 mm behind the socket face. Joints in cast iron pipes with special jointing arrangements like 'Tyton' joints etc. shall follow the instructions of the manufactures. In special cases if flanged joints are accepted by the Engineer the joints shall be made leak proof by inserting approved type of rubber gaskets. The bolts shall be secured in stages to avoid uneven strain. (b) Concrete Pipes Care shall be taken to place the collar centrally over the joint. 2.5 <u>TRENCHES AND OTHER EXCAVATIONS</u> Width of the trench at the bottom shall be such as to provide 200 mm clearance on either side of the pipe for facility of laying and jointing. Excavated material shall be stacked sufficiently away from the edge of the trench and the side of the spoil bank shall not be allowed to endanger the stability of the excavation. Spoil may be carted away and used for filling the trench behind the work. Turf, top soil or other surface material shall be set aside, turf being carefully rolled and stacked for use in reinstatement. All excavation shall be properly timbered, where necessary. Efficient arrangements for dewatering during excavation and keeping it dry till backfilling shall be made to the satisfaction of the Engineer. Sumps for dewatering shall be located away from the pipe layout. Where the excavation proceeds through roads necessary permissions shall be secured by the Contractors from the appropriate authorities. Special care shall be taken not to damage underground services, cables etc. These when exposed shall be kept adequately supported till the trench is backfilled.		

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The backfilling shall be done only after the pipeline has been tested and approved by the Engineer. Special care shall be taken under and sides of the pipe during hand packing with selected material. At least 300 mm over the pipe shall also be filled with soft earth or sand. Consolidation shall be done in 150 mm layers. The surface water shall be prevented from getting into the filled up trench. Traffic shall not be inconvenienced by heaping up unduly the backfilling material to compensate future settlement. All future settlements shall be made good regularly to minimise inconvenience of traffic where applicable. 2.6 <u>FIXTURES</u> The Tenderer shall mention in his bid the type and make of the fixtures he intends to use enclosing manufacturer's current catalogues. In the absence of any such agreement, the Engineer shall be at liberty to choose any type and make. All fixtures and fittings shall be of approved quality and type manufactured by well known manufacturers. All items brought to the site must bear identification marks of the type of the manufacturer. Procurements shall be made well in advance and inspected and approved immediately by the Engineer. All fixtures shall be adequately protected, covered and plugged till handed over. All fittings, gratings, fasteners, unless specified otherwise, shall be chromium plated. The connecting lead pipes and bends shall weigh at least 3 kg. per 25 mm dia per meter length. Where PVC or similar pipes are allowed the Contractor shall produce the test reports and convince the Engineer about their durability. Unless specified in the contract the fixtures shall be as specified hereinafter 2.6.1 Water closet (a) Raised type It shall include glazed vitreous china basin with siphon, open front solid plastic seat and plastic cover, low level glazed stoneware flushing cistern with valveless fittings, supply connections and		

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necessary fittings. All fittings shall be chromium plated. Colour of basin, cistern, seat and cover shall be as desired by the Engineer. (b) Squatting type It shall include glazed vitreous china pan with foot rests and high level cast iron flushing cistern with valve less fittings, supply connections and necessary fittings. All fittings shall be chromium plated. The foot rests shall be made of white glazed vitreous china with chequered surface. The flushing cistern shall be painted as desired by the Engineer. 2.6.2 Urinals It shall consist of wall type glazed vitreous china urinals, cast iron automatic flushing cistern complete with supply connections, flush pipe, lead pipes, gratings, traps and all other necessary fittings. Automatic flushing shall be approximately once every five minutes. For a number of urinals located together may be served by one cistern of adequate capacity. All fittings shall be chrome plated. 2.6.3 Wash basin It shall be made of glazed vitreous china. The basin shall be flat back, wall hung by painted cast iron brackets and complete with pattern with hot and cold brass faucets with nylon washers, waste chain, waste washers, lead waste pipes with traps, perforated waste complete with necessary fittings. All fittings including faucets shall be chromium plated. 2.6.4 Sink It shall be made of Marble or Granite. It shall be wall hung by painted cast iron brackets and complete with one brass faucet with nylon washers, waste chain, waste washers, and lead waste pipes with traps, perforated waste with necessary fittings. All fittings including faucets shall be chromium plated.		

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2.6.5	Bathroom mirror It shall be made of the best quality 6 mm thick glass and produced by a reputed mirror manufacturer. It shall be wall mounted with adjustable revolving brackets. The brackets, screws and other fittings shall be chromium plated.	
2.6.6	Glass shelves Glass shelves shall consist of 6 mm thick clear glass with guard rails and shall be wall mounted with brackets. All brackets, guard rails and screws shall be chromium plated.	
2.6.7	Towel rail Towel rails shall be 20 mm dia chromium plated MS pipes wall mounted with steel brackets. The brackets, screws etc. shall also be chromium plated.	
2.6.8	Soap holder It shall be made of chromium plated strong members. The holders shall be wall mounted with chromium plated screws.	
2.6.9	Liquid soap dispenser It shall be round and easily revolving with removable threaded nozzle. The body, bracket for wall mounting and screws shall be chromium plated.	
2.6.10	Toilet roll holder It shall be made of glazed vitreous china with suitable cover cum cutter. Wall mounting screws shall be chromium plated.	
2.6.11	Installation All plumbing fittings and fixtures shall be installed in most workmanlike manner by skilled workers. These shall be perfect in level, plumb, plane, location and symmetry. All items shall be securely anchored to walls and	

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	floors. All cuttings in walls and floors shall be made good by the Contractor.	
2.7	<u>EFFLUENT DISPOSAL</u>	
2.7.1	Effluent Disposal The effluent from the septic tank shall be disposed by allowing it into an open channel or a body of water if the concerned authority approves or into a soak pit for absorption by soil or shall be allowed to be absorbed by soil through open jointed CI pipes laid in a trench filled with broken bricks.	
2.7.2	Joining C.I. Pipes / dispersion trenches Minimum dia of the CI pipe shall be 150 mm nominal. The trench for laying the pipes shall be minimum 600 x 600 mm pipes. The joints of the pipes shall be made with lead. The entire length of the pipe within the trench shall be buried in 250 mm layer gravel or crushed stone of uniform size. On top of gravel/crushed stone layer is a 150 mm bed of well graded coarse aggregate. Ordinary soil is used for fill in the top of trench.	
2.8	<u>SEWAGE TREATMENT PLANT</u> Please refer. Annexure-I	
3.0	<u>TESTING AND ACCEPTANCE</u>	
3.1	<u>INSPECTION BEFORE INSTALLATION</u> All pipes, fittings and fixtures shall be inspected, before delivery at the site to see whether they conform to accepted standards. The pipes shall again be inspected on site before laying by sounding to disclose cracks. All defective items shall be clearly marked and forthwith removed from the site.	
3.2	<u>TESTING OF PIPELINES</u> Comprehensive tests of all pipe lines shall be made by simulating conditions of use. The method of actual tests shall be decided by the Engineer. All test data shall be recorded and submitted to the Engineer for review	

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and instruction. The Engineer's discretion regarding tolerance shall be final. General guidance for the tests are given below: (a) Smoke test All soil pipes, waste pipes and vent pipes and all other pipes when above ground shall be approved gastight by a smoke test conducted under a pressure of 25 mm of water and maintained for 15 minutes after all trap seals have been filled with water. The smoke is produced by burning oily waste or tar paper or similar material in the combustion chamber of a smoke machine. Chemical smokes are not satisfactory. (b) Water test For pipes other than Cast Iron Glazed ware and concrete pipes shall be subjected to a test pressure of at least 1.5m head of water at the highest point of the section under tests. The tolerance figure of two litres per centimetre of diameter per kilometre may be allowed during a period of 10 (ten) minutes. The test shall be carried out by suitably plugging the low end of the drain and the ends of connections, if any, and filling the system with water. A knuckle bend shall be temporarily jointed in at the top end and a sufficient length of the vertical pipe jointed to it so as to provide the required test head or the top end may be plugged with a connection to a hose ending in a funnel which could be raised or lowered till the required head is obtained and fixed suitably for observation. Subsidence of test water may be due to one or more of the following cases : (i) Absorption by pipes and joints (ii) Sweating of pipes or joints (iii) Leakage at joints or from defective pipes		

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(iv) Trapped air. Allowance shall be made for (a) by adding water until absorption has ceased and after which the test proper should commence. Any leakage and the defective part of the work shall be cut out and made good. For cast iron pipes Cast iron sewers and drains shall be tested as for glazed ware and concrete pipes. The drain plug shall be suitably strutted to prevent their being forced out of the pipe during the test. (c) For straightness (i) By inserting at the high end of the sewer or drain a smooth ball of a diameter 13 mm less than the pipe bore. In the absence of obstruction, such as yarn or mortar projecting through the joints, the ball will roll down the invert of the pipe and emerge at the lower end; and (ii) By means of a mirror at one end of the line and lamp at the other. If the pipe line is straight, the full circle of light may be observed. The mirror will also indicate obstruction in the barrel if the pipe line is not straight. 3.3 <u>FIXTURES ETC.</u> All fixtures and fittings shall be connected by watertight joints. No dripping shall be accepted. 4.0 <u>CODES AND STANDARDS</u> Some of the important Codes and Standards relevant to this specification shall be followed: Latest editions shall always be consulted.		

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(a) IS:1172 : Code of basic requirements for water supply drainage and sanitation (b) IS:1200 : Laying of water and sewer lines including appurtenant items. (Pt. XVI) (c) IS:1239 : Mild Steel Tubes and Mild Steel Tubular and other (Pt. I & II) wrought steel pipe fittings (d) IS:1536 : Centrifugally cast (Spun) iron pressure pipes for water gas and sewage (e) IS:1537 : Vertically cast iron pressure pipe for water, gas & sewage. - (f) IS:3486 : Cast Iron spigot & socket drain pipes (g) IS:1537 : Vertically cast iron pressure pipe for water, gas & sewage (h) IS:3486 : Cast Iron spigot & socket drain pipes (i) IS:1742 : Code of Practice for building drainage (j) IS:5329 : Code of Practice for sanitary pipe work above ground for buildings (k) IS:2470 : Code of Practice for designs and construction of septic tank for small and large installations (l) IS:3076 : Low density polythelene pipes for potable water supplies. (m) IS:4984 : High density polythelene pipes for potable water supplies.			

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(n)	IS:1537	:	Vertically cast iron pressure pipes for water, gas and sewage.
(o)	IS:1538	:	Cast Iron fittings for pressure pipes for water, gas & sewage.
(p)	IS:1230	:	Cast Iron rain water pipes and fittings.
(q)	IS:3889	:	Centrifugally cast (spun) iron spigot & socket soil waste and ventilating pipes, fittings and accessories.
(r)	IS:1729	:	Sand cast iron spigot & socket soil, water and ventilating pipes and accessories.
(s)	IS : 1626	:	Asbestos cement building pipes, gutters and fittings (spigot & socket types)
(t)	IS:458	:	Concrete pipes (with and without reinforcement)
(u)	IS:783	:	Code of Practice for laying of concrete pipes.
(v)	IS:784	:	Prestressed concrete pipes.
(w)	IS:651	:	Salt glazed stoneware pipes & fittings
(x)	IS:4127	:	Code of practice for laying of glazed stoneware pipes
(y)	IS:1726	:	Cast Iron manhole covers and frames intended for use in drainage works
(z)	IS:5961	:	Cast Iron gratings for drainage purposes
(aa)	IS:5219 (part- I)	:	'P' & 'S' traps.
(bb)	IS:771	:	Glazed earthen-ware sanitary appliance.

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(cc) IS:772 : General requirements of enamelled cast iron sanitary appliances. (dd) IS:774 : Flushing cistern for water closets & urinals (valveless siphonic type) (ee) IS:775 : Cast Iron brackets & supports for wash basins and sinks (ff) IS:2548 : Plastic water closet seats & covers. (gg) IS:2527 : Code of Practice for fixing rain water gutters and down-pipes for roof drainage.		

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ANNEXURE –I SEWAGE TREATMENT PLANT <u>DESIGN BASIS</u> The raw sewage quantity shall be estimated based on total no. of users. The anticipated no. of users may be considered as 1500 for design purpose. The proposed raw sewage and treated water characteristics are as follows:				
(a)	Parameter	Unit	Inlet	Outlet
(b)	Total Suspended Solids (TSS)	mg/l	200	<10
(c)	BOD	mg/l	300	<10
(d)	COD	g/l	-	-
(e)	Oil & Grease	mg/l it	20	-
1.0 <u>TREATMENT FACILITIES</u> 1.1 The treatment facilities comprise the following process units: 1.1.1 Pre Treatment 1.1.2 Inlet Chamber and Screen Chambers 1.1.3 Raw sewage transfer pumping station 1.1.4 Grit Chamber & Fine screen chamber 1.1.5 Aeration Basin 1.1.6 Membrane Bio reactor 1.1.7 Dis infection 1.1.8 Treated water Reservoir				

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1.1.9	Sludge Sump	
2.0	<u>PROCESS DESCRIPTION</u>	
2.1	<u>INLET CHAMBER</u>	
	An Inlet chamber is provided to receive the raw Sewage from various building.	
2.2	<u>MEDIUM SCREEN</u>	
	Raw Sewage passes through medium bar screen with 20 mm opening wherein floating material of size greater than 20 mm will get trapped. The cleaning of the screens would be done manually.	
2.3	<u>RAW SEWAGE SUMP CUM EQUALISATION</u>	
	Raw sewage is collected in the sanitary water storage tank where besides arresting the turbulence, flow equalisation also takes place. The storage tank is designed for 1 day storage. Submersible pumps shall transfer the sewage from this sump to the grit chamber for further treatment.	
2.4	<u>GRIT CHAMBER</u>	
	The flow from the sanitary water storage tank shall be passed into the 2(1W+1S) grit chamber tanks for removal of grit/inorganic matter. It is a channel in which sewage flows continuously where grit/inorganic matter get settled down according to settling velocity of grit particles. The settled grit particles get disposed off through chute. Grit free sewage flows to Fine bar screen chamber.	
2.5	<u>FINE BAR SCREEN CHAMBER</u>	
	The grit free sewage is subjected to screening in the mechanical fine bar screens of 2mm opening. The fine material will be screened and lifted by the rake, taken out through belt conveyor and dropped on to the trolley.	

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2.6 <u>AERATION BASIN</u> The sewage from the fine bar screen is transferred into the aeration basin, where Air is supplied to provide oxygen for BOD removal and for nitrification process. 2.7 <u>MBR BASIN</u> Partially stabilized mixed liquor from aeration tank will flow into the MBR basin by gravity. Membranes are placed in the tank. Diffusers supply air for membrane cleaning and mixing requirements. Part of the mixed liquor is recycled back to the aeration basin. The excess sludge from aeration basin shall be sent to sludge holding tank. The sludge from Sludge holding tank will be disposed to ash pond by means of sludge transfer pumps. 2.8 <u>DISINFECTION</u> The treated sewage from MBR shall be chlorinated with sodium hypo chloride and the chlorinated water will be stored in treated sewage storage tank.		

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<u>SEWAGE TREATMENT PLANT</u> <u>LIST OF CIVIL UNITS</u> (a) Inlet Chamber (b) Manual Screen Chamber (c) Sanitary Water Storage tank (d) Grit Chamber (e) Fine screen chamber (f) Aeration tank (g) MBR Tank (h) Sludge Holding Tank (i) Chemical House		

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<u>SEWAGE TREATMENT PLANT</u> <u>LIST OF MECHANICAL EQUIPMENT</u>					
		TOTAL	WORKING	STANDBY	MATERIAL OF CONSTRUCTION
(a)	Manual Bar Screen	2	1	1	SS316
(b)	Sanitary Water transfer pumps	2	1	1	C :CI ,I: FRP;Shaft:SS316
(c)	Submercible Mixer	1	1	0	SS304
(d)	Grit Chamber	2	1	1	RCC
(e)	Fine bar screen Recirculation	2	1	1	SS316
(f)	Recirculation pumps	2	1	1	C :CI ,I: FRP;Shaft:SS316
(g)	Diffuser - Preaeration Basin	1	lot		EPDM/Silicone
(h)	Submerged Membrane Units	-	-	-	-
(i)	Aeration Air blower	2	1	1	CI
(j)	MBR air blower	2	1	1	CI
(k)	Permeate Pumps	1	1	0	C & I;CI
(l)	CIP cleaning Tank	1	1	0	HDPE
(m)	CIP cleaning Tank agitator	2	1	1	SS316
(n)	CIP cleaning chemical feed pump	1	1	0	PP
(o)	Hypo Dosing Tank	2	1	1	FRP

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(p)	Hypo Pumps	Dosing	1	1	0	Diaphragm :PTFE
(q)	Hoist		2	1	1	MS

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VOLUME VIII/B SECTION – 23 ANTI-TERMITE TREATMENT		

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barrier or the treatment may start 500 mm below ground level. The bottom surface and sides of excavation (upto a height of about 300 mm) for column pits, walls trenches and basements shall be treated with chemicals at the rate of 5 litres / M2 of surface area. Backfills around columns, walls etc. shall be treated at the rate of 7.5 litres / Sqm of the vertical surface. Chemical treatment shall be done in stages following the compaction of earth in layers. The treatment shall be carried out after the ramming operation is done by rodding the earth at 150 mm centres close to the wall surface and spraying the chemicals in the specified dose. 2.2.2 Treatment of Top Surface of Plinth Filling Holes 50 mm to 75 mm deep at 150 mm centres both ways shall be made with crowbars on the surface of compacted plinth fill. Chemical emulsion at the rate of 5 litres / M2 of surface shall be applied prior to laying soling or sub-grade. Special care shall be taken to maintain continuity of the chemical barrier at the junction of vertical and horizontal surfaces. 2.2.3 Treatment of Soil Surrounding Pipes, Wastes and Conduits Special care shall be taken at the points where pipes and conduits enter the building and the soil shall be treated for a distance of 150 mm and a depth of 75 mm at the point where they enter the building. 2.2.4 Treatment of Expansion Joints These shall receive special attention and shall be treated in a manner approved by the Engineer. 2.2.5 Treatment at Junction of the Wall and the Floor Special care shall be taken to establish continuity of the vertical chemical barrier on inner wall surfaces from ground level up to the level of the filled earth surface. A small channel 30 x 30 mm shall be made at all the junctions of wall and columns with the floor. Rod holes made in the channel up to the ground level 150 mm apart and the chemical emulsion poured along the		

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channel at the rate of 7.5 litres per square meter of the vertical wall or column surface. The soil should be tamped back into place after this operation. 3.0 <u>ACCEPTANCE CRITERIA</u> The Contractor shall give a 10-year service guarantee in writing supplemented by a separate and unilateral guarantee from the specialised agency for the job to keep the building free of termites for the specified period. 4.0 <u>METHOD OF MEASUREMENT</u> Complete work of anti-termite treatment shall be measured for plinth area treated. This includes treatment, to foundations, walls, trenches, basements, plinth, buried pipes, conduits etc. The extended portions of foundation and like beyond plinth limit shall be the part of complete work. 5.0 <u>I.S. CODE</u> Relevant code applicable for this Specification. (a) IS: 6313 (Part-II) : Code of Practice of Anti-Termite Measures in Buildings Pre-constructional chemical treatment measures.		

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SHEETING WORK IN ROOF AND SIDING

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1.0 <u>SCOPE</u> This specification covers the erection of asbestos, C.G.I., aluminium or metal sheet covering to roof and side walls at various elevations and the fabrication and/or installation of asbestos, C.G.I or aluminium or metal gutters, flashings etc., as shown on drawings. 2.0 <u>STORAGE OF MATERIALS</u> 2.1 <u>CARE & STORAGE BEFORE INSTALLATION</u> All materials shall be stored by the Contractor in proper way to prevent all damage. If the materials are issued at site by the Owner, the Contractor shall at the time of issue, satisfy himself about the condition of issued sheets, gutters, etc. and no complaints shall be entertained later. The following points should be taken care of the Storing of Sheets: 2.1.1 Do not have uncovered sheets left lying in the open, Store in a covered area. If it is stored outside, cover the sheets with waterproof covers. Leave some space between the cover & the Sheetstacks, so that air circulation is possible. 2.1.2 The sheet should be stacked neatly, above the ground and in an inclined fashion/gentle sloping. This shall allow the rain water to drain off automatically. 2.1.3 It is advisable to keep each bundle of sheet, separately. 2.1.4 Do not store sheets, where people can walk over them. 2.2 <u>HANDLING AND HUMAN TRAFFIC MOVEMENT</u> On large building, handling time can be reduced by lifting sheet bundles with Crane, onto the roof frame. Care must be taken such that the weight of sheet bundle is not too much that it affects the structure. Where mechanical handling facilities are not present, sheets can be un-loaded & passed on to the roof, one at a time.		

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Sheets should not be dragged over the ground or any rough surface. Sheets should also not be dragged over each other. Tools used for erection should be carried and not dragged over the sheets. During erection & maintenance time, worker should careful when walking on roof. General procedure of walking on roof are : 2.2.1 When walking parallel to the ribs, walk on at least two ribs. 2.2.2 When walking across the ribs, walk close to or over the roofing supports. 2.3 <u>FASTERS & SEALANT</u> The steel sheet be fastened with nominal 40 mm zinc coated or nominal 25 mm zinc-tin alloy coated, Hex head, Self-drilling screw as per As 3566-2002 class 3 fastner of approved make with EPDM washer. The fastner size shall be calculated as per the design or manufacturer's recommendations. Natural cure, Silicon sealants should be water resistant, non-corrosive, resistance to extreme temperatures, retain good flexibility and of approved make. It shall be applied at all end laps as per approval by the engineer-in-charge. 2.4 <u>WORKMANSHIP</u> The workmanship shall be according to best construction practice to give a water tight finish to the satisfaction of the Engineer fixing of gutters and down pipes shall be according to IS:2527. 2.4.1 <u>Asbestos Sheeting</u> Asbestos sheets of profiles as stated in the Schedule of Items, shall be fixed with minimum 150 mm end lap and side laps as per manufacturer's specification Hook bolts or J-bolts shall be 8 mm dia. at 305 centres 6 mm dia galvanised iron seam bolt and nut with G.I. flat washers and bitumen washers shall be used for stitching ridge capping, corner pieces, ventilators, north light curves etc.		

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2.4.2	C.G.I. Sheetting and Aluminium Sheetting Side laps shall be 2 corrugations for roof and one corrugation for side sheetting. End laps shall be minimum 150 mm for roof and 100 mm for side sheetting. In ridges and hips where plain sheets are used the end laps shall be minimum 100 mm. Holes in C.G.I sheets shall preferably be made on the ground. The sheets should be placed on trestles and holes punched in the ridge of the corrugation from the outside inward for obtaining proper seating of limpet washers. Sheets shall be secured to sheet framing by 8 mm dia. galvanised iron hooks or J-bolts and maximum 305 mm apart. The length of the hook or J- bolts shall be to suit the sections of the bearers. Sheets shall also be bolted at the ends at every third corrugation with 6 mm dia. galvanised iron seam bolts and G.I. flat washers and bituminous washers.	
2.4.3	Firbre Glass Reinforced Plastic Sheetting This shall be of thickness and profile as mentioned in the drawing. Colour and light transmittance shall be as mentioned in drawings and or schedules. Where used in conjunction with C.G.I. or asbestos sheetting the end and side laps and fixing device shall be same as used for general sheetting. Where used in lieu of glass, the fixing shall be by means of timber or metal glazing beads as mentioned in drawing. In all cases, the installation shall be completely watertight and able to withstand the designed wind-pressure.	
2.4.4	Metal sheetting Sheetting should be fixed, strictly as per construction drawings. The maximum length of sheets should be the maximum transportable length. The number of sheets and the length of sheets to be worked out considering the minimum number of laps/joints in the roof system. The sheets and all accessories should be factory cut & then sent to site. Cutting of sheets at site should be avoided. If cutting of sheet at site is required, metal sheets should be cut by a Power saw with a metal cutting blade which leaves less redundant burr. Manufacturer's recommendations should be strictly followed. Before installation of roofing & cladding, it should be ensured that the supporting structure should be in true plans/perfect alignment, correctly placed & securely fixed. Cladding erection for each elevation	

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should commence at the bottom & proceed towards the top in order to ensure tight fitting laps. The installed profiled sheets have a side lap of at least one corrugation. The end lap should have sufficient overlap depending upon the slope of the roof. The end laps should use sealant so as to ensure that there is no leakage of rain water from the joints.

The General guidelines :

	Roof Slope	End lap (min.) mm	End lap (max.) mm.
(a)	Less than 1 in 4 (15°)	150	250
(b)	Greater than 1 in 4 (15°)	150	250
(c)	Wall	100	200

The suggested end laps & no. of fasteners used should be as per manufacturer's recommendations.

During cutting, drilling operations, the resulting small, sharp left over metallic particles or swarf can result stains on the coated steel roof. Swarfs should be removed & the Coated steel surface properly cleaned. During fastner installation, the installer should stand 90° to the panel, facing the purlin & drive the fastner until it is tight and the washer is firmly seated. Fasteners should not be over-driven. Proper fastner driver as recommended by manufacturer should be used for self drilling screw.

3.0 ACCEPTANCE CRITERIA

The installations shall present a neat appearance and shall be checked for water tightness. The following shall be checked:

- 3.1 Side and end laps
- 3.2 Absence of cracks, holes or damages in sheet

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3.3 3.4 3.5 4.0	Spacing of bolts, screws along with washer Provision of double washers (G.I. and asbestos or bituminous washers) Proper installation of flashing <u>IS CODES</u> The following are some of the important IS Codes relevant to this sections : (a) IS : 3007 : Code of practice for laying of asbestos cement sheets. (b) IS : 2527 : Code of practice for fixing rain water gutters and down pipes for roof drainage. (c) IS : 1626 : Specification for asbestos cement building pipes gutters and fittings. (d) IS : 277 : Specification for galvanised steel sheets (plain and corrugated). (e) IS : 14246 : Continuously pre-painted galvanized steel Sheets & coils (f) As-3566-2002 : Self-drilling screws for the building and construction industries. (g) As-1397 : Steel Sheet & Strip – Hot dip zinc-coated or aluminium/zinc coated. (h) AS/NZS 2728 : Prefinished/Pre painted sheet metal products for interior/ exterior building applications– Performance requirements. (i) IS-277-2003 : Galvanized Steel Sheet (Plain & Corrugated). (j) IS-513-1994 : Cold-rolled low Carbon Steel sheets & strips.	

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BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
1	IFB	3.0 (4)	Submission of Price Bid	We request the Owner to consider the submission of Part 2 bid i.e. Price Bid after completion of Techno-commercial discussions. Kindly consider.	Bid specification shall prevail
2	IFB	4.1(b)	On Demand Bank Guarantee Values	Please let us know the exact percentage of On Demand Bank Guarantee the executants of the consortium need to furnish.	Clause No. 4.0 is self explanatory
3	IFB	4.2.4 (iii)	On Demand Bank Guarantee Values	Please let us know the exact percentage of On Demand Bank Guarantee the executants of the consortium need to furnish.	Clause No. 4.0 is self explanatory
4	IFB 1, 2, 2A, 2B, 2C		Contract Value & Contract Price	We have observed that the word "Contract Value" is wrongly used instead of "Contract Price" and vis-a-versa in various clauses of Volume - 1. Request Owner to re-verify.	Pl refer corrigendum No. III
5	1	1.0	Introduction	We request Owner to provide update on the status of Coal Linkage, MoEF clearance and other aspects of project development.	Pl refer clause No. 11.1.1. The query is irrelevant to the clause
6	1	4	In the event of award of the contract by the Owner to the Consortium, the lead member shall submit CP security to 10% of the contract price and the other members of consortium shall submit on Demand BG amounting to 1.5% of contract price.	Since consortium members are already jointly and severally liable and as such separate BG from each partner is not necessary in addition to performance security of 10% being provided by consortium leader. It is therefore requested to kindly amend the clause based on above request.	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
7	1	4.2.4 iii)	In case of award of the contract, in addition to the Contract Performance Security to be submitted by the successful bidder, every Indian Manufacturer (if the entity other than the successful bidder) and collaborator shall submit on demand Bank Guarantee equivalent to 0.5% of the total contract price.	We request Owner to consider the following : 1) Indian Manufacturer and Collaborator shall submit on demand Bank Gurantee equivalent to 0.25% each (Total of 0.5%) of SG Price. 2) Indian Manufacturer and Collaborator shall submit on demand Bank Gurantee equivalent to 0.25% each (Total of 0.5%) of STG Price.	Bid specification shall prevail
8	1	7.1	The Goods and services from any country of origin shall be acceptable	Please advise whether Material and Equipment for BTG and BoP produced from China would be acceptable.	Bid specification is clear & self explanatory
9	1	10.3	The bidder irrevocably agrees..... Knowledge of bidder about the site conditions / statutory provisions	Please understand that variance due to statutory provisions is beyond the responsibility of bidder and hence we request you to delete statutory provisions from the clause	Bid specification shall prevail
10	1	13.2	Some supporting documents/printed literature may be in any other language which must be accompanied by an accurate translation of the same in English duly certified by an official translator engaged by the Court in whose jurisdiction the bidder's work place resides.	Kindly allow the translation of Foreign Languages be carried out by an independent person who has knowledge of English and Foreign Language with a self declaration certificate notarised in the court of Law.	Bid specification shall prevail
11	1	15.1.1	Currency of Bid:	We request Owner to permit quoting the bid in INR + three (3) foreign currencies i.e. Total of four (4) currencies instead of total of three (3) mentioned in the tender document.	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
12	1	15.1.1	Currency of Bid	Please allow the bidders to quote atleast 3 currencies other than Indian Rupee as the present bid is an ICB and need sourcing of various equipment from different countries of origin. This is even the standard practice followed by other well known power utilities	Bid specification shall prevail
13	1	15.1.2	Currency of Bid: Notwithstanding the provisions above, the prices for services to be performed in India such as Inland Transportation, Marine cum Erection Insurance, Civil and Architectural Works, Erection, Testing & Commissioning etc. shall be quoted in Indian Rupees (INR) only.	Since expatriates will also be involved in providing services for the Project, we therefore request Owner to allow quotation of such services in foreign currencies.	Bid specification shall prevail
14	1	15.2.1i) 15.2.1ii)	i) Price for Supply of Equipment/materials manufactured in India (shall also include the foreign currency portion towards imported raw materials, if any). ii) Price for Supply of Mandatory Spares manufactured in India (shall also include the foreign currency portion towards imported raw materials, if any).	Please clarify if the Foreign Currency Portion declared towards procurement of imported raw material in Onshore Supplies shall be paid in foreign currency by Owner. Also confirm Bidder's understanding that the Foreign Currency Portion to be declared by the Bidder under 15.2.1i) & 15.2.1ii) shall be the CFR value of Imported Raw Material in the Supply Price for Equipments manufactured in India.	Pl refer corrigendum No.III

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
15	1	15.2	Bid Price	Please clarify whether the supply of fitting & fixtures, shutters etc those required for civil works are to be included in Supply Contract or Civil Contract.	Clause No. 15.2 of Sec I is self explanatory
16	1	16.2	Exept for the taxes.....liability towards the same.	In case there are additional taxes applicable other than those specified in the the price schedule, the same shall be borne by the owner with a ceiling to the extent submitted by the bidder in the proposal.	Clause No. 16.2 of Sec I is self explanatory
17	1	18.1	Zero Date	In the definition provided Zero Date is defined as the date of issuance of LOA or NTP if the LOA does not stipulate the same. Kindly clarify the exact Zero Date to be considered for various milestones	Clause No. 18.1 of Sec I is self explanatory
18	1	18.2	~. The bidder, in his bid, shall offer the completion period as may be achievable by him and also indicate the details of various inputs required by him from the owner and their due dates in number of delays from <u>the date of award of the contract</u> in the format as per Schedule-6. ~	Please modify as below; "~. The bidder, in his bid, shall offer the completion period as may be achievable by him and also indicate the details of various inputs required by him from the owner and their due dates in number of delays from <u>Zero Date</u> in the format as per Schedule-6. ~"	Pl refer corrigendum No.III
19	1	18.3	The project completion period finally offered by the bidders as above shall be considered for evaluation of bids.	The Price Loading rate for various Guarantee factors Data is given in the tender document for the purpose of bid evaluation. Further, the tender specifies submission of the Guarantee Completion period (i.e. Schedule 7) in Part-1. This will straightway open the Differential Price (on account of loading on delivery schedule) to all the bidders before opening of the price bid. Hence it is requested to confirm that that the Guaranteed Completion Schedule may be submitted in the Price Bid (i.e. Part-2).	Pl refer corrigendum No.III

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
20	1	18.4	Reduction of contract price to the extent of difference between the contractor's evaluated price and the lowest evaluated price against this bidding.	Kindly elaborate with an example.	Bid specification is clear in this regard
21	1	18.4	If the situation warrants, the owner reserves the right to accept the base bid at its offered price. However, in such a case, if the contractor (successful bidder) fails to achieve the completion of the project within the contractual completion period, the contract price payable shall be 'reduced to the extent of difference between the contractor's evaluated 'price and the lowest evaluated price against this bidding.	As Project Schedule is included in evaluation (Cl. 18.3 & 31.6, Section 1), we request Owner to award the Project to Bidder with Lowest Evaluated Price. Hence we request for deletion of this Clause.	Bid specification shall prevail
22	1	18.4	If situation warrants.....against the bidding.	We request owner to elaborate on this.	Bid specification is clear in this regard

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
23	1	18.4	If the situation warrants, the owner reserves the right to accept the base bid at its offered price. However, in such a case, if the contractor (successful bidder) fails to achieve the completion of the project within the contractual completion period, the contract price payable shall be reduced to the extent of difference between the contractor's evaluated price and the lowest evaluated price against this bidding.	Please clarify the reduction in price concept and whether this reduction shall be over and above the LD for delay which shall be deducted.	Bid specification is clear and self explanatory in this regard
24	1	18.6	Electronic schedule & payment withheld for non-approval of schedule	As, the scope of contract is full EPC, all activities are within the responsibility of contractor (except activities related to owners inputs). We will submit the output of primavera (latest version) in acrobat reader format instead of *.mpp format Contractor will submit the detailed schedule covering the packages/ major equipment and activities as mentioned in this clause, however, for ease of constructibility, monitoring and control, bidder requests the WBS format shall be as per bidder's standard format. We also request that the proposed withholding of payment to link with bidders 'submission' of schedule instead of its 'approval'. Also,pl. refer to clause 18.9 , 18.10	Bid specification shall prevail

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
25	1	18.6	Work completion schedule indicating all construction, erection & commissioning activities in Microsoft Project format	Kindly give the option to submit the work completion schedule in Primavera also	Bid specification shall prevail
26	1	18.7	Schedule shall be generally based on Owner's Standard template of WBS	Kindly share the standard template so that we may analyse the same and decide how far it is feasible to submit the same in the standard template	Bid specification shall prevail
27	1	18.8	The activities shall be detailed to the extent that except for a few exceptions where further breakdown of the activities is not logical, the duration of the activity does not exceed 30 days period	30 days period is too less. Many activities of engineering / manufacture take more than 30 days.	Bid specification shall prevail
28	1	19	condenser back pressure- 76 mm Hg	As per clause no. 19.0 of Volume-1, Section-1 of the tender specifications, for guarantee purposes condenser back pressure is mentioned as 76 mm Hg. However, in Volume-III B, Section-1, Page 77/308, Clause 1.11.1, the same is specified as 77 mm Hg. We presume that the data given in Volume-1 prevails over Volume-III B. Kindly confirm	Mahagenco confirms that stipulation of Clause No. 19.0 of Volume-I shall prevail
29	1	19.1	Loading factor of INR 1,50,00,000.00 for completion period	Please define the unit of measurement (per month, per week, per day etc)	Pl refer Corrigendum issued vide our letter No. DG/BSL U-6/2011/T-1/0162 dtd 09.01.12
30	1	19.1	Duration offered (considering the lowest as base) for Completion of the Project as envisaged under Clause No. 30.1, Section - 2 of Bid Specification	Please clarify if this loading for shortfall in duration is per month or per day or else as the same is missing.	Pl refer Corrigendum issued vide our letter No. DG/BSL U-6/2011/T-1/0162 dtd 09.01.12

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
31	1	19.1	Sr. No. 1 INR 15,000,000 loading for evaluation	Only value is mentioned. Please clarify the rate of loading (e.g. per month)	Pl refer Corrigendum issued vide our letter No. DG/BSL U-6/2011/T-1/0162 dtd 09.01.12
32	1 3	19.1 (4) 6.3 (3)	Auxiliary Power Consumption	In line with standard industry practice, we request Owner to consider Auxiliary Power calculation for Loading as well as for Guarantee purposes to be measured on "kW" basis instead of "kWh" basis specified in the Bid Specification. Also request Owner to please clarify the measurement points & other equipment/systems/areas to be covered for guaranteeing the auxiliary power consumption. All items are not getting covered in clause 6.3 of section 3, Volume I, for eg TG lube oil with purification system, gland steam exhaust systems, seal oil system, H2 system, stator water coolant system, OLTCs, CCW system, Dosing system, Mill rejects system, Misc. pumps etc. Also excitation losses have been included erroneously in the list, since the generator output of 660 MW is net off of the excitation power.	Pl refer corrigendum No.III Refer Section 3
33	1	19.1 (5)	For increase of every 5 mg/Nm ³ in Suspended Particulate Matter (SPM) level (considering lowest quoted SPM Level as base). Bids with SPM level more than 50 mg/Nm ³ shall be rejected outright.	As per prevailing norms SPM level of 50 mg/ Nm ³ is acceptable. Therefore, SPM level should be included in "Guarantees under Correction" and not used for evaluation. Kindly consider.	Bid specification shall prevail

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
34	1	19.1 (5)	For increase of every 5 mg/nm ³ in suspended particulate Matter (SPM) level (Considering lowest quoted SPM level as base). Bids with SPM level more than 50mg/nm ³ shall be rejected.	For Performance Guarantee, SPM shall be considered at 100% TMCR with one field out . Please confirm	Mahagenco confirms that Performance Guarantee, SPM shall be considered at 100% TMCR with one field out in each path .
35	1	22.2	Deviations without cost of withdrawal and not acceptable to Owner shall be deemed to be withdrawn by the bidder	Please appreciate that there could be deviations, for which, no cost can be allocated. In such deviations, we request the client to discuss the deviations mutually and agree before price bid opening. Please confirm.	Bid specification shall prevail
36	1	22.3 & 22.4	Separate Submission of Deviations associated with price	It is requested that for Part-1 of the bid, all the commercial and technical deviations may be listed in Annexure- VIIA and VIIIA respectively. The Annexure-VIIB and VIIIB may be used only for price bid.	Bid specification shall prevail
37	1	24.2	Enclosure-4 : Submission of Guaranteed Completion period in Part-1 of the bid	The Price Loading rate for various Guarantee factors Data is given in the tender document for the purpose of bid evaluation. Further, the tender specifies submission of the Guarantee Completion period (i.e. Schedule 7) in Part-1. This will straightway open the Differential Price (on account of loading on delivery schedule) to all the bidders before opening of the price bid. Hence it is requested to confirm that that the Guaranteed Completion Schedule may be submitted in the Price Bid (i.e. Part-2).	Pl refer corrigendum No.III

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
38	1	24.2	Enclosure -3 Copy of the bid specification (Volume I to Volume - VIII) including all clarifications, corrigenda, addenda, errata, amendments thereto issued by the owner duly sealed and signed (without filling in any data)	As the Bid Document runs into few thousands of pages, it would not be practicable to submit this Enclosure-3. We suggest to Owner to instead consider one page declaration by Bidder.	Only one copy along with original
39	1	24.2	Enclosure - 4	Kindly note that Schedule - 7 (GURANTEED TECHNICAL PARAMETERS) shall be submitted along with the Part - 2 i.e. Price Bid and not along with the Part - 1 i.e. Techno-Commercial Bid Enclosure- 4 since guaranteed technical parameters impact evaluated price.	Pl refer corrigendum No.III..
40	1	24.3 Annexure-I(B)	The Part-2 i.e. Price Bid	The list of Enclosures provided in section 24.3 and in Annexure-1(B) is not matching. We request Owner to provide us the final list.	
41	1	27.3	Declaration of information during Bid opening	Since this is public tender opening, it is requested to declare the following during bid opening: 1. Correctness of BG in terms of value and validity 2. Presence of absence of DJU in the bid, alongwith the name of the parties signing the bid 3. Presence or absence of Power of Attorney 4. Declaration regarding No Deviation on critical clauses mentioned in clause 28.4 of Volume-1, Section-1 of tender specifications. 5. Confirmation about submission of Price Bid in electronic format with in stipulated time by the bidders.	Bid specification shall prevail

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
42	1	28.4	The bid does not conform directly or indirectly, explicitly or implicitly shall be considered as substantially non-responsive hence rejected and shall not be considered for further evaluation and thereby opening of price bid.	Please allow bidder to <u>suggest deviation with cost of withdrawal.</u>	Bid specification shall prevail
43	1	28.4	The bid which is found to be meeting stipulated qualifying requirements, however, does not conform directly or indirectly, explicitly or implicitly, to the major commercial terms & conditions contained in Volume - I of this specification namely: 1. Duration of Completion of the Project and Project Network Schedule (Clause 18.0, Section - 1) 2. Contract Performance Security (Clause 14.0, Section- 2). 3. Bank Guarantees against the Contract (Clause 15.0, Section - 2) 4. Billing Break-up and Delivery Schedule for the Goods to be Supplied (Clause 11.0, Section- 2A). 5. Billing Break-up of Contract Value (Clause 26.0, Section - 2B) 6. Terms of Payment (Clause 12.0, Section- 2A and Clause 27.0, Section - 2B).	According to this clause, the bids which do not confirm to listed clauses will be treated as non-responsive and rejected. However GCC has provision for the Bidder to take deviations and give cost of withdrawal against such deviations. Hence such deviations will be completely withdrawn by the bidder, if the Owner so desires, and the cost of withdrawal of deviations will be added to the bid price for the purpose of bid evaluation. Please clarify that in such cases, the bids will not be treated as non-responsive.	Bid specification shall prevail

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
		Continued	7. Liquidated Damages (Clause 30.0, Section- 2 read with Clause 6.0, Section - 3) 8. Insurance (Clause - 28.0, Section 2 and Clause - 6.0, Section - 2B). 9. Performance Guarantee Test (Clause 39.0, Section - 2). 10. Defect Liability (Guarantee) Period (Clause 43.0, Section - 2) 11. Final Acceptance and Handover of Unit (Clause 41.0, Section - 2) 12. Arbitration (Clause 64.0, Section - 2) 13. Phased Manufacturing Programme (Clause 8.0, Section- 3) shall be considered as substantially non-responsive hence rejected and shall not be considered for further evaluation and thereby opening of price bid.	Continued as above.	

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
44	1	28.4	The bid which is found to be meeting stipulated qualifying requirements, however, does not conform directly or indirectly, explicitly or implicitly, to the major commercial terms & conditions contained in Volume - I of this specification namely: 1. -----13. shall be considered as substantially non-responsive hence rejected and shall not be considered for further evaluation and thereby opening of price bid.	Bidder requests Owner to consider exclusion on these terms & conditions specially "Terms of Payment" because the Terms of Payment shall result in serious cash flow issues to the Bidder , who is a newly established Indian Manufacturing facility and are yet to initiate full scale commercial operations. We request Owner to instead consider these terms & conditions as a loading factor for evaluation of Bids. We also request Owner to maintain the Terms of Payment same as NTPC Tenders which are win-win for both Owner and Contractor.	Bid specification shall prevail
45	1	28.4	Bids meeting the qualifying requirementsshall be considered as substantially non responsive hence rejected and not considered for further evaluation and thereby opening of price bid.	Since post bid discussions allow addressal of deviations/ clarifications, the clause may be suitable modified as follows which incidently is also adopted by NTPC in the recent Bulk tenders " Bidders are not expected to take deviations on major commercial terms and conditions in Vol I. The employers determination of a bid's responsiveness is to be based on the content of bid itself without recourse to extrinsic evidence, If a bid is not substantially responsive, it may be rejected "	Bid specification shall prevail
46	1	28.4 (9)	Performance Guarantee test (clause 39.0 section 2)	Please confirm that PG test requirement listed under no deviation clause and explained in clause 39 of section 2 includes Category I guarantees only.	Mahagenco shall revert separately

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
47	1	29.1	After opening of Part - I i.e Techno-commercial bid in both electronic as well as physical form.....	Please confirm whether Part - I is also to be submitted in electronic form...this is contrary to what is specified in Cl. 24.1.	Pl refer corrigendum No.III
48	1	29.1	After opening of Part - 1 i.e. Techno-commercial bid in both electronic as well as physical form and preliminary evaluation as stipulated under Clause 28.0 above thereof,.....	Kindly clarify whether Part 1 (techno-commercial) shall be in both electronic as well as physical form because contrary clause 24.1 states "The Part - 1 is to be submitted in Physical form"	
49	1	29.4	By obtaining clarifications/ confirmations in respect of each of the technocommercial bids, all the bids will be brought at par as far as technical requirements and commercial terms & conditions are concerned	Various bidders possess different technologies for equipment design and manufacture. As far as functional requirements are concerned, all the bidders can be brought at par, however bringing the bidders technically at par is practically not possible. It is therefore requested that all the deviations agreed by MahaGenco with the individual bidders, may be circulated to all the bidders and on the basis of that, the bidders may be given the option to optimise their bid. Since it is two part bidding process, bidders may be allowed to submit, in the form of supplementary price bid, a lump-sum reduction in their prices which may result out from the optimisation. This will help MahaGenco in the reduction of overall cost of the project	Pl refer corrigendum No.III
50	1	31.1.3	Cost of withdrawal of deviations	What will be the policy of MahaGenco if during post bid discussions, the bidder agrees to withdraws the deviations (associated with price) without price implication	Bid specification is clear in this regard

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
51	1	31.4.1	The Owner has applied for Mega Power Project Benefits under Mega Power Project Policy of Govt. of India.	Please advise whether the Owner has obtained the Mega Power Status for this project as the basis for applicable Taxes to be considered for this project i.e considering Mega Power Benefits or Non Mega. Alternatively, all bidders may be asked to quote on Mega and Non Mega basis.	Bid specification is clear & self explanatory in this regard
52	1	31.4.1	The Owner has applied for Mega Power Project Benefits	Please confirm if we can consider mega power project benefits in our bids. Please also confirm availability of required documentation to avail such benefits	Bid specification is clear & self explanatory in this regard
53	1	31.4.2	The current provisions of the Mega Power Project Policy mandates price preference to the domestic manufacturers. As per directive of this policy, the import content (bid price in foreign currency of the supply portion) shall be increased by 15% of CIF price of the import content. For the purpose of this clause, the CIF price of import content in Ex-works price shall be 90% of the foreign currency portion of the Ex-works price whereas in case of CFR price, the same shall be 100.5% of the CFR price.	Bidder understands that Insurance shall not be considered for evaluation of bids, hence we presume that price preference loading must be on CFR price of Import Content only.	Bid specification is clear in this regard

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
54	1	31.4.2	Price Basis for Imports, Insurance by Contractor	In Cl. 31.4.2 loading criteria for both CIF & CFR prices have been defined. Whereas Schedule-1 of Price Bid stipulates bidders to quote CFR prices for imported equipment & spares. On the other hand Cl. 28.0 of Section-2 stipulates Contractor's to include all risk insurance in prices. Please clarify whether the Contractor's shall quote prices on CFR or CIF basis.	Bid specification is clear in this regard
55	1	31.5	For the purpose of evaluation.....is a holiday for SBI	We request owner to accept record date as 7 days prior to last date on submission of bid.	Bid specification shall prevail
56	1	34.1(ii)	On Demand Bank Guarantee Values	Please let us know the exact percentage of On Demand Bank Guarantee the executants of the consortium need to furnish.	Clause No. 4.0 is self explanatory
57	1	35	Construction of contract	We request to award separate contracts on each consortium member including provision of each member receiving payments directly from the owner	Bid specification shall prevail
58	1	35.1	Construction of the Contracts: The contracts shall be entered into with the successful bidder as under:	Please modify as below Construction of the Contracts: The contracts shall be entered into with the successful bidder (and <u>each consortium member</u> , if any) as under:	Bid specification shall prevail
59	1	35.1	Construction of the Contracts: The contracts shall be entered into with the successful bidder as under:	Please define the construction of the Contracts in case the bidder is a consortium of Indian and Foreign entities.	Bid specification is clear in this regard

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
60	1	35.2	Signing of contract	There is no separate contract and payments for Civil Works defined although additional Conditions for Civil Works in Section-2C have been specified. As you may appreciate the tax structure of Civil Contract shall be different than other Site services viz. Erection & Commissioning. Please clarify whether there will be a separate contract for Civil Works.	Pl refer corrigendum No.III
61	1	35.2	Construction Of Contract & Annexure -XII (Proforma for Contract Agreement)	Please clarify which terms and conditions to be included for each type of Contract Agreement? Say for Supply Contract Agreement, will it include the Terms and Conditions of SECTION 2B &2C (Services and Civil)? If so, then what will be the corresponding Schedules and Annexure, Contract Price & value of subsequent bonds etc applicable for each of the three Contract Agreements.	Pl refer corrigendum No.III
62	1	35.2	First contract: includes goods of Indian origina and of foreign origin and despatched directly to site	Please confirm that for goods of foreign origin and despatched directly to site, sale on high seas shall be effected	Pl refer corrigendum No.III

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
63	1	35.2 35.3	35.2 In case the successful bidder is an Indian Entity: i) First Contract: ii) Second Contract: iii) Third Contract: 35.3 In case the successful bidder is a Foreign Entity: i) First Contract: ii) Second Contract: iii) Third Contract:	The Contracting structure prescribed in the Tender document under 35.2 and 35.3 is intermeshing the services and Supply Contract. We request Owner to consider the contracting structure on optimized tax structure basis. i.e. (i) First Contract : For CIF (Indian port of entry) supply of plant and equipment including type test charges and mandatory spares to be supplied from abroad. (ii) Second Contract : For Ex-works (India) supply of domestically manufactured plant and equipment including type test charges and mandatory spares. (iii) Third Contract : For providing all services i.e. port handling, port clearance and port charges for the imported goods, further loading, inland transportation for delivery at site, inland transit insurance, unloading, storage, handling at site, installation services including erection, civil, structural & allied works, insurance covers other than inland transit insurance, testing, commissioning and conducting Guarantee tests in respect of all the equipments supplied under the 'First Contract' & the 'Second Contract' and all other services as specified in the Contract Documents.	Bid specification shall prevail
64	1	35.3	The foreign bidder, however, has the option, to be exercised as a part of its bid proposal, to propose an Assignee in its bid to execute the Second Contract and/or the Third Contract	MAHAGENCO is requested to kindly allow an Assignee for Indian bidder as well for the 2nd and 3rd contract. This is requested to avoid sub-contracting route and better taxation formation.	Bid specification shall prevail

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
65	1	35.8	If the successful bidder fails to sign the contract....	We kindly request the client that where the contract agreement is not signed within 90 days from date of LOA for no reasons attributable to the Bidder, then the Bidder shall have the right to suspend the contract and the parties shall mutually agree on equitable adjustment to the contract price and to the completion schedule and/or other relevant conditions of the contract. In such case we request the client, not to forfeit the Performance Guarantee.	Bid specification shall prevail
66	1	37.1	SparesOwner reserves the right after evaluation and at the time of award to vary the quantity of spares and / or delete any item ...or add altogether new item of spares.....	We suggest that the changes to the requirement of mandatory spares to be agreed by the Parties. Also confirm that the mandatory spares shall be ordered alongwith the main equipment (and not upto 6 months after LOA)	Bid specification shall prevail
67	1	2.0, Annexure - I(A)	Status of the Bidder	Please incorporate necessary changes pertaining to the concept of consortium of EPC company and Qualified manufacturers.	Pl refer corrigendum No.III
68	1	Annexure - II Schedule - 8(B)	Proforma for Bank Guarantee against Bid Security Proforma for On Demand Bank Guarantee to be submitted by the parent Manufacturer/ subsidiary Company/ JV Company/ Indian Promoter/ Collaborator	We request Owner to include the " <u>Notwithstanding</u> " clause in the Bank Guarantee formats on lines of Clause no. 10 of Performance Guarantee format (Schedule 8(A), Section 1) of Bid Documents.	Pl refer corrigendum No.III

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
69	1	Annexure - IV	Summary of Qualification	Please incorporate necessary changes in the Format pertaining to the experience and qualification of EPC company	Pl refer corrigendum No.III
70	1	Annexure - V (B) and Schedule 8-B	Format of DJU and BG	We would like to discuss the format of DJU and BG in Detail	Bid specification shall prevail
71	1	Annexure - V(A), Cl 2.	In case of any breach of the Contract(s).....shall be in line with provision on Limitation of Liability of the said contract(s). The liability of the parent Manufacturer hereunder shall however, be limited to an amount calculated at the rate of USD 221/ 122/ 343 Million for each of the equipment set to be supplied by the bidder/contractor.....	The liability limit of the parent Manufacturer is specified as USD 221 / 122 / 343 Million. We request Owner to clarify the applicable liability limit amounts for SG & ST Parent Manufacturers.	Mahagenco shall revert separately
72	1	Annexure VA	Arbitration provision in DJU & Consortium Proforma & the three Contract Agreements	We request to stipulate uniform acceptable arbitration procedural rule, law and place in all proforma (DJU, Consortium) and also in the three Contract Agreements. We propose that the appointment of Arbitrators & Arbitration procedural rule shall be as per institutional rule of ICC, LCIA or equivalent.	Mahagenco shall revert separately

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
73	1	Annexure-V(A)	Formats of Deed of Joint Undertaking Annex-V(A)	Inline with the amendment No. DG/BSL U-6/2011/T-1/858 issued on 23/02/2012, the named formats need to be amended to suit the revised Qualification Requirement. Kindly arrange to issue the revised formats Please clarify if separate DJUs are to be provided -one related to SG package and one related to STG package. Further, the obligations mentioned in each DJU shall apply to its respective scope - that is for SG scope under the DJU related to SG and for STG scope under the DJU related to STG package. The DJU format needs to be modified	Mahagenco shall revert separately
74	1	Annexure- V(B)	Formats of Deed of Joint Undertaking Annex-V(B)	Inline with the amendment No. DG/BSL U-6/2011/T-1/858 issued on 23/02/2012, the named formats need to be amended to suit the revised Qualification Requirement. Kindly arrange to issue the revised formats	Mahagenco shall revert separately
75	1	Annexure - VI	Proforma of Consortium Agreement	Please incorporate necessary changes pertaining to the concept of consortium of EPC company and Qualified manufacturers.	Mahagenco shall revert separately
76	1	Annexure- VI	Formats of Proforma for Consortium Agreement	Inline with the amendment No. DG/BSL U-6/2011/T-1/858 issued on 23/02/2012, the named formats need to be amended to suit the revised Qualification Requirement. Kindly arrange to issue the revised formats We request the Client to accept the Consortium Proforma as per the Parties agreement, confirming that the Parties will be jointly and severably liable to the Client.	Mahagenco shall revert separately
77	1	Annexure-VI	Consortium Agreement	Kindly redraft the Consortium agreement in lieu of the revised Qualification requirement 4.1 vide letter no. DG/BSL U-6/2011/T-1/0853, dt.23/02/2012.	Mahagenco shall revert separately

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
78	1	Annexure-VI	Consortium Agreement Proforma	We request the Client to accept the Consortium Proforma as per the Parties agreement, confirming that the Parties will be jointly and severably liable to the Client.	Bid specification shall prevail
79	1	Annexure-VI 3.0	vii. To take all the action for entire ~. All the members further agree and irrevocably accept that the leader member shall only be authorized to accept payments from the owner and upon making the payments to the lead member, the owner shall have discharged in full from all its liabilities to the consortium.	vii. To take all the action for entire-. All the members further agree and irrevocably accept that the leader member and the consortium member(s), if any, shall be authorised to accept the payments from the owner	Bid specification shall prevail
80	1	Annexure-VI 3.0vii	Lead Member: vii. To take all the action for entire execution of the Contract and accept payments on behalf of the Consortium from the owner. All the members further agree and irrevocably accept that the leader member shall only be authorised to accept payments from the owner and upon making the payments to the lead member, the owner shall have discharged in full from all its liabilities to the consortium.	Kindly allow the Consortium partners to receive independent payments based on the Division of Work for each member(To be declared in the Contract Agreement). Common Stream of Payment through Lead Partner for the Consortium shall expose the Consortium to Association of Persons (AOP) risk. AOP risk can be mitigated where it is clear from the contract that 1. No common scope of work 2. No common stream of payment 3. No sharing of profits and losses Hence, we request Mahagenco to structure the Contract structure in such a way that no AOP risks are envisaged.	Bid specification shall prevail

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
81	1	Annexure-XII	 wherein all the member's of the consortium jointly and severally shall be perform the obligations of the contractor and lead member of the consortium is authorised to do all acts and deeds including incurring liabilities and receive payments on behalf of the consortium to give effect to this contract.	Kindly allow the Consortium partners to receive independent payments based on the Division of Work for each member(To be declared in the Contract Agreement). Common Steam of Payment through Lead Partner for the Consortium shall expose the Consortium to Association of Persons (AOP) risk. AOP risk can be mitigated where it is clear from the contract that 1. No common scope of work 2. No common stream of payment 3. No sharing of profits and losses Hence, we request Mahagenco to structure the Contract structure in such a way that no AOP risks are envisaged.	Bid specification shall prevail
82	1	Annexure-XII Schedule-3 1.0	Details of Price Adjustments 1.1.1 The Ex-Works/FOB price element of price for supply of Equipment and Mandatory Spares thereof shall be subject price adjustment limited to $\pm 20\%$ of the said price component	Kindly remove this ceiling of $\pm 20\%$ on the price adjustment as prescribed in Schedule 3 (Details of Price Adjustments) in accordance with the GOI directive in case of NTPC Vs Technopromexport and NTPC Vs Power Machines and the recent EPC tenders, where in price adjustment of NTPC EPC Tender is without Cieling.	Bid specification shall prevail
83	1	Annexure-XII	Construction Of Contract & Annexure -XII (Proforma for Contract Agreement)	Please clarify which terms and conditions to be included for each type of Contract Agreement? Say for Supply Contract Agreement, will it include the Terms and Conditions of SECTION 2B & 2C (Services and Civil)? If so, then what will be the corresponding Schedules and Annexure, Contract Price & value of subsequent bonds etc applicable for each of the three Contract Agreements.	Pl refer corrigendum No.III

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
84	1	4.0, Annexure - XII	Cross Fall breach clause	The said clause is incomplete.	Pl refer corrigendum No.III.
85	1	Schedule - 1	Proforma for Break-up of Prices (Notes)	Please advise whether the Deemed Export benefits are still available for Projects bid under ICB route.	Bid specification is clear in this regard
86	1	Schedule 3	New introduction	As the project involves work related to Power Station railway siding and Shunting Locomotive, we request Owner to kindly allow price adjustment for the following items also: 1. Rails 2. Sleepers 3. Signaling Cables 4. Contract & Catenary Wires 5. Fabricated & Galvanized Steel Structures Suitable formulae for the items can be proposed by Bidder at bidding stage.	Bid specification is clear & self explanatory in this regard
87	1	Schedule 3 1.1.1,	Price Adjustments - cap of +/- 20% of contract price of the particular equipment/ item	The recent tenders of NTPC do not stipulate any cap/ limit on the price adjustment amount. We request you to kindly delete these provisions in line with recent practice.	Bid specification shall prevail

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
88	1	schedule 3	Price Adjustments - cap of +/- 20% of contract price of the particular equipment/ item	Same as above. Pl. see reference clauses as below 1.1.4, 1.2.3, 1.3.1, 1.3.3, 1.4.1, 1.4.3, 2.3, 3.3	Bid specification shall prevail
89	1	Schedule-3, Cl 1.4.2	Wp ₀ = Wholesale price index	Please intimate the name of commodity	Pl refer corrigendum No.III
90	1	Schedule -3, 1.4.2	Wp ₀ = 'Value of "Wholesales Price Index" as declared by Office of the Economic Advisor, GoI, New Delhi as on base date	We understand that "Wholesales Price Index for <u>All Commodities</u> " will be considered for calculating price adjustment for Supply of Aggregate. Kindly confirm.	Pl refer corrigendum No.III
91	1	Schedule -3, 3.1	Cw ₀ = Value of Consumer Price Index (New Series) for Industrial Workers applicable for working price center as on base date as Published by Labour Bureau, Shimla, government of India	As Bhusaval is not a published price centre of Labour Bureau, we request to consider Nagpur as the price centre for calculating value of Consumer Price Index for Industrial Workers.	Nasik being the Northern Headquarter of Maharashtra, Nasik shall be considered as price centre for calculating value of Consumer Price Index for Industrial Workers.
92	1	Schedule-3, Cl 1.1.4	Total price adjustment payable against this contract for particular equipment shall not exceed $\pm 20\%$ of the Ex-Works/FOB price of the particular equipment/Mandatory Spare as the case may be	The limiting value of $\pm 20\%$ should be applicable to the total supply contract price of main equipment / mandatory spares and not on individual equipment / item / invoice.	Mahagenco shall revert separately

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
93	1	Schedule-3, Clause 1.2.3	the price adjustment shall not exceed $\pm 20\%$ of the contract price of particular steel item	The limiting value of $\pm 20\%$ should be applicable to the total supply contract price of steel and not on individual item / invoice.	Mahagenco shall revert separately
94	1	Schedule-3, Clause 2.1	The contract price adjustment for Erection, Testing & Commissioning Charges shall be as per following formula	Please confirm that for the purpose of price variation, the PV shall be paid on the total value indicated by the bidder at S. No. 2.0 of Schedule-1 (excluding taxes and duties)	Pl refer corrigendum No.III
95	1	Schedule-3, Clause 3.1	The contract price adjustment for Civil, Structural & Architectural Works shall be as per following formula	Please confirm that for the purpose of price variation, the PV shall be paid on the total value indicated by the bidder at S. No. 3.0 of Schedule-1 (excluding taxes, duties and supply price of steel)	Pl refer corrigendum No.III
96	2 1	Schedule-3, all clauses	In the event of the work performed beyond scheduled date of completion of the respective activity, the price adjustment shall be worked out based on i) the scheduled date of completion of respective activity and ii) the actual date of completion of the activity and whichever is beneficial to the owner shall be payable	Please confirm that : In the event of the work performed beyond scheduled date of completion of the respective activity due to reasons attributable to the Owner , the price adjustment shall be worked out based on i) the scheduled date of completion of respective activity and ii) the actual date of completion of the activity and whichever is beneficial to the Contractor shall be payable	Pl refer corrigendum No.III
97	1	Schedule 4	Details of import content of bid	This schedule shall also include the value of goods manufactured in a factory located in a SEZ area	Noted

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
98	1	Schedule-5	Unit Price for addition / deletion	This is an EPC contract and the bidder will quote lump-sum prices for the equipment to be supplied by him under the pervue of this contract. The unit rates of the small items indicted in Schedule-5 can not be operated during execution of the contract. The same is explained at S. No. 18.1 of Section-2, Volume-1 of tender specifications. Hence, Schedule-5 may please be deleted.	Pl refer corrigendum No.III
99	1	Schedule 7	Guaranteed Technical Parameters and LD for failure to meet performance guarantees - TG Cycle Gross Heat rate and SG efficiency	This being a turnkey EPC tender, we request that the performance guarantee is requested on Unit Gross Heat rate basis which incorporates the TG Cycle HR and SG efficiency	Bid specification shall prevail
100	1	Schedule 7	Guaranteed Technical Parameters: Suspended Particulate Matter (Maximum acceptable is 50mg/Nm3)	For Performance Guarantee, SPM shall be considered at 100% TMCR with one field out . Please confirm	Mahagenco confirms that Performance Guarantee, SPM shall be considered at 100% TMCR with one field out in each path .
101	1	Schedule 7	Guaranteed Technical Parameters and LD for failure to meet performance guarantees - TG Cycle Gross Heat rate and SG efficiency	This being a turnkey EPC tender, we request that the performance guarantee is requested on Unit Gross Heat rate basis which incorporates the TG Cycle HR and SG efficiency	Bid specification shall prevail
102	2	1.1 (g)	Equipment performance guarantee of the units for a period of 12 months from the date of performance guarantee test of the Plant equipment.	Our understanding for equipment performance guarantee is "equipment warranties". Please clarify.	Mahagenco shall revert separately

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
103	2	3.0 (xxxvi)	Zero Date	In the definition provided Zero Date is defined as the date of issuance of LOA or NTP if the LOA does not stipulate the same. Kindly clarify the exact Zero Date to be considered for various milestones	Bid specification is clear in this regard
104	2	3.1.xxxvi	zero date	In case of delay in advance payment beyond the contractual period, the zero date shall be the date of receipt of advance by the bidder	Pl refer corrigendum No.III
105	2	6.2	The Contractor shall be deemed to have inspected the site ~ including the nature of ground and sub-soil, ~. Site condition shall not relinquish the contractor from any of his obligations / responsibilities to be discharged and performed under the contract as per schedule within the contract price.	It is not possible for Contractor to totally eliminate the possibility of unforeseen physical condition of sub-soil and underground, in such a case, which requires inspection method or equipment(s) beyond currently available technology. In such a case Contractor shall be given extension of time along with cost increase as per actual base for converting subsoil condition ~	Bid specification shall prevail
106	2	6.2	Ground & sub-soil condition- Bidder's risk	As this an existing site, we kindly request the owner to provide the bidder with site and soil investigation report at least three month prior to bid submission	Bid specification shall prevail
107	2	9.2	The contract agreement is signed in ONE ORIGINAL and TWO COPIES.	This clause is in contradiction to Clause 35.7 Section 1 which states "The contract agreement is signed in One Original and One Copy"	Pl refer corrigendum No.III
108	2	16	Ownership of goods. = First contract: includes goods of Indian origin and of foreign origin and despatched directly to site	Please confirm that for goods of foreign origin and despatched directly to site, sale on high seas shall be effected	Pl refer corrigendum No.III

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
109	2	16.1	Notwithstanding anything stated herein, the contract shall be a Single Source responsibility supply- cum-erection including associated Civil Works contract but split into relevant Contracts for the sake of convenience.	Kindly clarify the statement "split into relevant Contracts for the sake of convenience" because Bidder understand that the Contract Structure defined under 35.2 and 35.3 of Section 1 is defining three independent contacts with definative Title transfer of Goods and Services bounded together with Cross fall Breach concept.	Bid specification is clear in this regard
110	2	16.2	The owner and the contractor agree and acknowledge that notwithstanding anything to the contrary contained in this contract, this contract is a turnkey contract	Kindly confirm the intent of the client defining the Contract as Turnkey Contract because the Owner has specified breaking up of the overall contract as independent 3 contracts under 35.2/35.3 with cross fall breach clause.	Bid specification is clear in this regard
111	2	18.1	As this contract is a lump sum contract on turnkey basis, any change in the contract price arising out of any alteration.....	Kindly confirm the intent of the client defining the Contract as Turnkey Contract because the Owner has specified breaking up of the overall contract as independent 3 contracts under 35.2/35.3 with cross fall breach clause.	Bid specification is clear in this regard

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
112	2	21	Vendor/ Subcontractor approval prior to appointment	To avoid any delays during execution, the list of approved vendors should be discussed and finalised before LOA and should form part of the contract as an approved vendor/ subcontractor list. We request you to suitably modify provisions of this clause accordingly. Cl. 21.2 & 21.3: Bidder shall be allowed to proposed additional names in its proposal and the same shall be reviewed and finalised before LOA and shall form part of the contract as an pre-approval vendor list. In case Contractor wishes to propose any new vendor, then contractor shall provide necessary credentials/ details of such supplier for Owner's approval Cl. 21.2. In case, owner deletes any vendor from the approved vendor list, Owner may do so but not later then 60 days prior scheduled date of placement of purchase order for such item so as not to effect the performance of the contract. In case, Owner does so after the above 60 days period, the Contractor shall be compensated for any impact on cost as well as on completion schedule. Please confirm	Bid specification shall prevail
113	2	21.2	The contractor shall procure the goods/equipment/services mentioned in the list stipulated in Volume - II of the contract from the approved sources stipulated therein	A qualified bidder with proven equipment, shall be awarded the contract by MahaGenco. If bidder himself is a regular manufacturer of the items indicated in Volume-II, Section-11, please confirm that no separate approval is required by him from Mahagenco to supply his own manufactuered items.	Bid specification is clear in this regard

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
114	2	21.2	In case of removal of approved sources by the Owner, if the contractor suffers any monetary loss due to such decision of the owner, the same shall be reimbursed against documental evidence	Any time loss shall also be to the account of the Owner.	Bid specification shall prevail
115	2	21.2	The contractor shall procure.....the source selected. The owner reserves the right to add/remove the sources for any item. Incase the source selected by the contractor is deleted by the owner after 15 days of intimation by the contractor , the contractor shall procure the goods/equipments/services from other approved sources. In such cases, if the contractor suffers any monetary loss due to such decision of the owner, the same shall be reimbursed agianst documental evidence.	Client to clarify that 15 days is the time he will take to inform the contractor from the date of intimation of source of goods/equipment/services regarding deletion of source selected by the contractor.	Bid specification is clear in this regard

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
116	2	21.3	However, the contractor may procure goods..... such source(s) proposed by the contractor. Such source proposed by the contractor should have.....one thermal power plant of 500 MW or above capacity.....should have completed the contractual gurantee period or should have suppliedto any power plant	Client to clarify and confirm our understanding that the contractor can source the equipment from any manufacturing works of the sub-vendor provided the make and model is same as supplied by some other manufacturing location of sub-vendor for 500 MW thermal power plant.. Client to also clarify the conditions of supply of equipment to the power plants viz. commercial operation, contractual gurantee etc. It is not feasible that the equipment supplied and under one year of commercial operation would have completed the contractual gurantee period.	Bid specification is clear in this regard and shall prevail
117	2	21.7	Except for the goods/equipment/services mentioned under Clause No 2, Section - 3, Volume - I and the items mentioned in the list stipulated under Volume - II, the contractor may procure other goods and services from the sources at his option.	We understand that no vendor approval is required from MahaGenco for the items other than those specified in Clause No 2, Section - 3, Volume - I and the items mentioned in the list stipulated under Section-11 of Volume - II. Kindly confirm.	Bid specification is clear in this regard

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
118	2	25.1	The contractor shall submit all the General Arrangement drawings, Mechanical, Electrical and Civil Design Basis/Criteria, Drawings, Data Sheets, Documents, Equipment and their Capacity Selection, Test Procedure etc. and other engineering documents stipulated elsewhere in the contract (hereinafter referred to and called as 'design document') for approval of the engineer along with the design calculations and general write up wherever involved.	1. Only a few documents, mutually agreed, shall be submitted for approval of the Owner and the balance documents/ drawings etc shall be submitted for intimation only. 2. Properity design calculation shall not be submitted.	Bid specification shall prevail
119	2	25.2	Delay in approval of drawings / design documents by Owner / consultant can not be considered as the reason for extension of work completion period	You would kindly appreciate that for completion of project, the duties are to be discharges by Contractor and Owner with in a particular time frame. Delays by the Owner shall also have impact on the completion period. Hence this clause may be deleted.	Bid specification is clear and shall prevail
120	2	25.4	Submission of design document in AutoCad	All the documents shall be submitted in hard copy. If Owner requires, the same can be submitted in non-editable pdf format also. Submission of documents in AutoCad is not envisaged	Bid specification shall prevail
121	2	28.0	Insurance	We understand that the Insurance price is not to be quoted in the Price Schedule. MAHAGENCO will reimburse the actual cost of Insurance as per procedures specified in this Clause. Kindly confirm.	Bid specification is clear in this regard

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
122	2	28.0	Insurance	We request MAHAGENCO to consider reimbursement of 15% towards handling charges over and above the Insurance premium.	Bid specification shall prevail
123	2	28	Price Basis for Imports, Insurance by Contractor	In Cl. 31.4.2 loading criteria for both CIF & CFR prices have been defined. Whereas Schedule-1 of Price Bid stipulates bidders to quote CFR prices for imported equipment & spares. On the other hand Cl. 28.0 of Section-2 stipulates Contractor's to include all risk insurance in prices. Please clarify whether the Contractor's shall quote prices on CFR or CIF basis.	Bid specification is clear in this regard
124	2	28.1	Taking Over	Various activities have been referred to with Taking Over as the milestone. Please include the definition of "Taking Over" in the tender. Taking over is appearing at various places like section 2 clause 28.1, 28.10, 41.4,42,43.2, section 2A clause 11.2.2, section 2B clause 6.2 and 12.1	Pl refer clause No. 41 of Section-2, Vol-I
125	2	28.5	The charges levied by the Directorate of Insurance or Lead Insurer proposed by them together with taxes and duties applicable thereon, if any, shall be reimbursed to the contractor at actuals.	We understand that Owner will make 100% payment of Insurance charges along with applicable taxes and duties immediately on submission of invoice along with copy of insurance cover by the Contractor. Kindly confirm.	Pl refer corrigendum No.III
126	2	29.1	The period of completion of the work as stipulated in this contract shall be deemed to be essence of contract.	Delay in meeting the Project Completion Period as agreed in the Contract, the Owner has the right to levy Liquidated Damages and once the LD cap is reached, Owner has the right to Terminate the Contract. Hence, please clarify the intent of this clause 29.1	Bid specification is clear & self explanatory

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
127	2	29.4	The owner.....stipulated under the contract	The contractor shall be given suitable notice and chances to justify the reasons for delay before the owner reaches any conclusion unanimously.	Bid specification shall prevail
128	2	29.4	Time is of essence-Termination for delay	We request the Client to exercise his right of termination for delay only after exhaustion of Delay LD limit and clarify the term "time is of essence"	Bid specification shall prevail
129	2	30.1	LD for Delay in Completion of Works	Please clarify the max. liability of the Contractor (cap for delay) against this clause	Bid specification is clear in this regard
130	2	30.1.1	Liquidated Damages for Delay	Kindly inform the ceiling for liquidated damages for delay	Bid specification is clear in this regard
131	2	30.1.1		Please specify the maximum liability (cap on LD) of the Contractor against this clause as the same is not specified.	Bid specification is clear in this regard
132	2	30.1.1	Completion of all the works covered under the contract pertaining to the unit under consideration.	In line with standard industry practice, we request Owner to consider date of completion of Trial Operation as date of completion of work and consider the same for calculation of Liquidated Damages for Delay in completion of Works. Therefore we request Owner to modify sub-clause 30.1.1 (a) and delete the sub-clause 30.1.1 (b)	Bid specification shall prevail
133	2	30.1.1.b	Completion of all the works covered under the contract pertaining to the unit under consideration	Please delete this clause because of subjectivity involved in it.	Bid specification shall prevail
134	2	30.1.5	New sub-clause to Cl. 30.1 Liquidated Damages for Delay in Completion of Works:	Cap for Liquidated Damages for Delay is not specified in this Clause. We request Owner to specify the cap as 10% of the Contract Price in line with the current prevailing norms in the Industry.	Bid specification is clear & self explanatory

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
135	2	30.2.2 30.4	Notwithstanding anything contained hereinabove; the total liability of the contractor against this clause No. 30.2 shall not exceed 10% of the contract value. the aggregate liability of the contractor towards payment of Liquidated Damages stipulated under clause Nos. 30.1 and 30.2 above shall not exceed 25% of the contract value.	Bidder understands that the following clause that maximum cap on Liquidated Damages for Delay in Completion of Works shall be 25% of the Contract Value. Please clarify.	Bid specification is clear in this regard
136	2	30.2.2 30.4	Ceiling of liquidated damages in terms of percentage of contract price	For the purpose of ceiling of liquidated damages, please confirm that the contract price shall be calculated on the basis of exchange rates prevailing on the record date	Bid specification is clear in this regard
137	2	30.3	The Owner may, without prejudice to any method of recovery, deduct the amount Liquidated Damages from any amount due or which may become due to the Contractor against this contract or any other contract for this project or any other project/work awarded by the owner.	We request Owner not to deduct LD applicable on this Contract from any other project/work awarded by the Owner.	Bid specification shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
138	2	30.4	Aggregate liability of LD	25% cap for aggregate LD for delay & performance appears to be very high. The individual cap of LD for delay is not specified. As per existing clause this would amount to 25% of contract price. This is very high. It is requested that cap on LD for delay and performance be kept 10% individually and aggregate cap for delay & performance be 15%. Pl review.	Bid specification shall prevail
139	2	30.4	Notwithstanding anything contained hereinabove, the aggregate liability of the contractor towards payment of Liquidated Damages stipulated under clause Nos. 30.1 and 30.2 above shall not exceed 25% of the contract value. For the purpose of this clause No. 30.0, the contract price shall mean the total contract price as per Price Schedule (Schedule - 1) of this contract (excluding price of mandatory spares) along with applicable price variation excluding the amount of taxes & duties.	We request Owner to consider the aggregate liability of the Contractor towards payment of Liquidated Damages stipulated under clause Nos. 30.1 and 30.2 to not exceed 15% of the Contract Price. The above request is in line with the prevailing industry norms.	Bid specification shall prevail

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
140	2	32	Suspension	Please add below 32.3 Contractor reserves the right to suspend whole or any part of the contract if Owner fails to pay to the Contractor the amount due under any certificate of the Engineer within a reasonable period after the same shall have become due under the terms of the contract. The date of completion shall be extended by a reasonable time, if any necessary and demonstrable costs incurred by the Contractor as a result of such suspension of the works shall be paid by the Owner.	Bid specification shall prevail
141	2	32	Suspension	The present clause does not have provision of suspension of Works by the Contractor for Owner's default. Request you to provide appropriate clause in line with prevailing industry norms.	Bid specification shall prevail
142	2	32.1	Suspension of the Work	Please include below phrase at end of 32.1; In case such suspension due to Owner, any necessary and demonstrable costs incurred by the Contractor as a result of such suspension of the works shall be paid by the Owner, provided such costs are substantiated to the satisfaction of the Engineer. If Suspension last for more than 3 months, Owner shall grant diversion of Contractor's resources, price implication and revised work completion schedule, if any, shall be mutually discussed and agreed upon.	Bid specification shall prevail
143	2	32.1	The Owner reserves.....duration of the suspension	In case the suspensions occurs due to reasons not attributable to the contractor, the contractor shall be given suitable time and cost compensation.	Bid specification is clear and shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
144	2	32.2	Suspension of work due to delay on part of contractor	The work delayed by the contractor should not be a reason for suspension of the work. Hence this clause may please be deleted.	Bid specification shall prevail
145	2	34.1	Interaction with other contractors	The contractor will be make correspondance with Owner / consultant only. Necessary inputs to other contractors shall be provided by Owner / consultant. This will facilitate in better control of the Owner.	Bid specification shall prevail
146	2	35.1	Change in quantity	In case of quantity reduction, If the contractor has already incurred any cost on design/ engineering/ ordering/ manufacturing etc, then the contractor shall be suitably compensated. In case of increase in quantity, the Owner shall suitably extend the contract completion period, on the basis of mutual agreement	Bid specification shall prevail
147	2	35.1	The Owner reserves.....original contract price	The extent of change in the total contract price due change in quantities shall be subject to mutual agreement.	Bid specification shall prevail
148	2	36.2	All travelling and Lodging & Boarding expenses for the engineering personnel to be trained during the total period of training will be borne by the Contractor. These engineering personnel while undergoing training shall be responsible to the Contractor for discipline.	We request Owner to consider all travelling and Lodging & Boarding expenses for the Owner's engineering personnel (to be trained during the total period of training) to Owner's account.	Bid specification shall prevail
149	2	36.3	In the event, the Owner for any reason does not consider it necessary to avail of the training facilities; he shall be entitled for rebate on this account.	As training is an integral part of the EPC Package therefore non-attendance of the same shall not make Owner entitled for rebate. Kindly confirm.	Bid specification shall prevail

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
150	2	36.3	In the event, the Owner for any reason does not consider it necessary to avail the training facilities; he shall be entitled for rebate on this account.	Please advise how the rebate would be calculated.	Pl refer corrigendum No.III
151	2	37.3.1	Trial Operation of 28 days with designated fuel	Please include: If the designated fuel is not available, the trial operation shall be conducted with the available fuel and the results shall be extrapolated and trial operation shall be considered as sucessfully completed.	Bid specification shall prevail
152	2	37.3.1	Trial Operation of 28 days with designated fuel	If the fuel of enough quantity is not available for conducting trial operation of 28 days, then the trial operation shall be conducted with the available quantity of fuel. In that case 28 days of trial operation shall not be done. Please confirm	Bid specification shall prevail
153	2	37.3.1	During these trials, all the standby equipment also shall be run alternatively to prove their performance	It is requested to waive off the mandatory condition of running the standby equipment during trail run.	Bid specification shall prevail
154	2	37.3.1	Trial operation (28days)	Trial operation shall be for 14days as per the normal practice.	Bid specification shall prevail

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
155	2	37.3	After satisfactory initial operation, the plant shall be put on trial operation. The period of trial operation shall be Twenty Eight (28) days of which minimum continuous seventy two (72) hours shall be at full load on designated fuel in fully automatic mode	Please modify as below; After satisfactory initial operation, the plant shall be put on trial operation. The period of trial operation shall be <u>fourteen(14)</u> days of which minimum continuous seventy two (72) hours shall be at full load on designated fuel in fully automatic mode	Bid specification shall prevail
156	2	38.1	the contractor shall be responsible for any loss or damage to the plant until the plant is taken over by the Owner in accordance with the contract	The plant shall be taken over after final acceptance. However, after trial operation, when the machine is operated by the Owner, the responsibility of loss or damage has to be ascertained on the basis of facts, and cost of making good the damage or loss shall be assigned to the <u>responsible party</u>	Bid specification shall prevail
157	2	38.1	Under the contract, the contractor shall be responsible for any loss or damage to the plant until the plant is taken over by the Owner in accordance with the contract.	The contractor shall be responsible for loss or damage only in case the loss or damage is attributable to the Contractor.	Bid specification shall prevail
158	2	39	Performance Guarantee Test	As per the specifications, life of some of the equipment/items is to be proved under PG tests. This requires normal running of the machine for a long time. Please confirm that contract completion period, warranty period and for release of payments shall be affected without waiting of completion of such tests.	Bid specification is clear in this regard

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
159	2	39.10	The completion of the successful completion of the test shall be completed within the period of 120 days maximum from the date of first operation of the unit on designated fuel.	The Project completion date shall be extended proportionately in case the Performance Guarantee Test is not conducted within 120 days for reasons attributable to the owner e.g Owner is not able to provide shutdown etc.	Bid specification shall prevail
160	2	41.4	In case of Delay in PG test due to reasons attributable to the Owner, the payment becoming due against completion of successful Performance Guarantee Test shall be released to the contractor against the Bank Guarantee of equivalent amount	Kindly inform the validity of such Bank Guarantee with a sunset clause. It is suggested that following may be inserted: If the Performance Guarantee Tests cannot be successfully completed within the a period of 6 months from the date scheduled date of PG test, for reasons attributable to the Owner, then the Contractor shall be deemed to have fulfilled its obligations with respect to the performance guarantees	Bid specification shall prevail

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
161	2	41.4	In case the Performance Guarantee Test cannot be carried out at specified time due to reasons attributable to the owner, the Plant shall be taken over 120 days after the intimation from the contractor provided the owner is satisfied about his readiness for conducting the Performance Guarantee Test. In such case, the Owner shall issue notification to the contractor to the effect that the plant is taken over which shall trigger the Defect Liability (Guarantee) Period and the payments becoming due against completion of successful Performance Guarantee Test shall be released to the contractor against the Bank Guarantee of equivalent amount. However, such taking over of the plant shall not absolve the contractor from its liability to prove the performance guarantees, which	We request the Owner to consider 60 days instead of 120 days specified in this clause. Further, for any delay in PG Test, correction curve shall be applicable. For delay beyond 60 days due to reasons attributable to Owner, we request Owner to reimburse the mobilization and demobilization expenses towards performing the PG Test. For delay beyond 180 days due to reasons attributable to Owner, the Contractor shall be relieved from the responsibility of performing the PG Test and the Bank Guarantee shall be returned.	Bid specification shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
		continued	shall be proven through a Performance Guarantee Test at the earliest possible from the date of taking over of the plant but not later than 30 days from the date of issuance of notice by the owner confirming its readiness to provide inputs required for the PG test.	Continued as above.	
162	2	41.4	In such case, the Owner shall issue notification to the contractor to the effect that the plant is taken over which shall trigger the Defect Liability (Guarantee) Period and the payments becoming due against completion of successful Performance Guarantee Test shall be released to the contractor against the Bank Guarantee of equivalent amount. However, such taking over of the plant shall not absolve the contractor from its liability to prove the performance guarantees, which shall be proven through a Performance Guarantee Test at the earliest possible from the date of taking over of the plant but not later than 30 days from the date of issuance of notice by the owner confirming its readiness to provide inputs required for the PG test.	Bidder understands that the following clause that liability to conduct Performance Guarantee Test has no Sunset Date. Please clarify the Owner's intention.	Bid specification shall prevail

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
163	2	42.1	Owner reserves the right to take possession of and use for any intended purpose, any portion or all of any delivered but as yet unaccepted Plant.	Any use of portion or all of any unaccepted plant should trigger the start of warranty of that particular equipment.	Bid specification shall prevail
164	2	42.1	Operating the plant before taking over	Please confirm that in case the Owner takes possession of and make use of the plant or part thereof before taking over, the same shall be considered as deemed Taking Over and all conditions related to Taking over shall apply	Bid specification shall prevail
165	2	42.1	Operating the plant before taking over	Upon Owner takingover the possession of and make use of the plant or part thereof before taking over the Plant is in operation under Owner's control , and hence the same shall be considered as deemed Taking Over as and all conditions related to Taking over shall apply. We request you kindly modify this clause accordingly	Bid specification shall prevail
166	2	43.1.e	the plant shall comply with the provisions of any applicable Indian Law of Directive in effect on the date of "Taking -Over" of the Plant	The change in laws at the time of taking over can not be predicted. Hence this clause may please be deleted	Bid specification shall prevail
167	2	43.1© 43.2	using only materials and goods for incorporation into the plant which are new and unused and so that such materials and goods	Please define "new" and "unused".	Bid specification is clear & self explanatory

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
168	2	43.12	Availability Guarantee of 90%	The availability of the plant depends on lot many factors other than the equipment. Hence it is requested to delete the requirement of availability guarantee. In any case, the availability guarantee can not be proved after the end of defect liability period	Bid specification shall prevail
169	2	43.12	At the end of defect liability period, the Contractor's liability ceases except for latent defects and Contractor's obligation to prove 90% availability of the plant.	The availability of the plant is a function of various parameters which are beyond the control of the Contractor. Accordingly the Contractor's obligation to prove 90% availability is not feasible.	Bid specification shall prevail
170	2	43.12	At the end of defect liability period, the Contractor's liability ceases except for latent defects and Contractor's obligation to prove 90% availability of the plant.	Please clarify "90% availability of the plant" beyond defect liability period against	Bid specification shall prevail
171	2	43.2	guarantee of equipment for a period of 12 (twelve) calendar months commencing immediately upon completion of successful Performance Guarantee Test of the Plant OR taking over of the plant by the owner as per the provisions of Clause No. 41.4	In case the PG test is delayed due to reasons attributable to the Owner, the plant shall be taken over on 120th day of intimatin from the contractor. However, the guarantee period shall start on the scheduled date of conductance of PG test.	Bid specification shall prevail

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
172	2	43.3	latent defect	Please confirm that latent defect period commences from COD for 36 months and also confirm that the latent defects are limited to such defects which inherently lie within the such defect which prevent the safe operation and which could not have been disclosed by reasonable examination carried out by the owner in accord with their manuals.	Bid specification is clear in this regard and shall prevail
173	2	44.1.3	All spares shall be properly protected and packed for long storage at site under prevailing conditions.	Please clarify the storage period at site.	Pl refer corrigendum No.III
174	2	44.2.1	It shall be the responsibility of the contractor to maintain adequate items in sufficient number, as erection & commissioning spares to ensure that erection commissioning works and operation upto end of guarantee period do not hamper for want of spares.	Erection and commissioning spares shall be available upto PG testing and thereafter because the plant will be operated and maintained by the owner, hence essential or mandatory spares will be available and used. Please clarify.	Pl refer corrigendum No.III
175	2	45	Long term availability of spares	We request the provisions of this clause be applicable to spares manufactured by the Bidder/ its Associates for TG/ SG. This is also inline with NTPC's recent tenders	Bid specification shall prevail
176	2	45.1	The Contractor shall ensure the long term availability of spares to the owner for the full life of the equipment covered under the contract.	Please clarify "Full life of the equipment ".	Pl refer corrigendum No.III

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
177	2	45.2	in case of discontinuance of manufacture of any spares by the Contractor or his sub- contractor, the contractor shall provide the owner, one year in advance, with full manufacturing drawings, material specification and technical information required by the owner for the purpose of manufacture of such items	Please modify as : However, the contractor's proprietary information, if any, shall be out of perview of this contract	Bid specification shall prevail
178	2	46	Power to omit or vary work	Please clarify the clause in case of omit / vary of work by Client on contract price, schedule and performance	Bid specification is clear in this regard and shall prevail
179	2	46.2	a reasonable and agreed sum in respect thereof shall be paid to the contractor	please modify as: a reasonable and agreed sum in respect thereof shall be paid to the contractor, in addition to mutually agreed extension in the contract completion period	Bid specification shall prevail
180	2	46.2	Powers to Vary or Omit Work:	Any variation, especially in the work already done, will require additional time also. Therefore, please add the word "along with suitable extension in contractual schedule" at the end of the clause.	Bid specification shall prevail
181	2	51.2	The Engineer shall issue to the Contractor progressive certificate certifying completion of works up to a said date, within a reasonable period after receiving of an application, there for, made in accordance with this clause.	Please clarify "reasonable period". Request the Owner to specify a definative period.	Bid specification is clear & self explanatory

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
182	2	56	The marginal notes to any clause of the contract shall not affect or control the construction of such clause.	Please guide that the notes to any clause shall not be read in conjunction with the main clause.	Bid specification is clear & shall prevail
183	2	60.1	The aggregate liability of the contractor to the owner under the contract shall not exceed the Total Contract Price	Please limit the aggregate liability in line with clause 30.4 of Section-2	Bid specification is clear in this regard and shall prevail
184	2	60.1 (b)	The aggregate liability of the contractor to the owner under the contract shall not exceed the Total Contract Price, provided that this limitation shall not apply to any obligation of the contractor to repair or replace defective equipment or to indemnify the owner with respect to patent infringement.	We request Owner to kindly note that liability of the Contractor to repair or replace defective equipment will be limited to the Total Contract Price and therefore request to delete "to repair or replace defective equipment or" from this clause.	Bid specification shall prevail
185	2	62	Force Majeure is herein defined as any cause which is beyond the control of the contractor or the owner as the case may be, which they could not foresee or with a reasonable amount of diligence could not have foreseen and which substantially affects the performance of the contract as mentioned hereunder but not limited to:	Kindly Clarify "But not limited to" in clause 62. We request the Owner to not keep the clause open ended and delete "But not limited to".	Bid specification shall prevail

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
186	2	62.1	Force Majeure conditins	Please include: f) strikes, blakouts or other industrial action or blockade or embargo or any other form of civil disturbance, in each case affecting on a general basis the industry related to the affected Services and which is not attributable to any unreasonable action or inaction on the part of the any Party or any of its Subcontractors or suppliers and the settlement of which is beyond the reasonable control of all such persons g) other unforeseeable circumstances beyond the control of the Parties against which it would have been unreasonable for the affected party to take precautions and which the affected party cannot avoid even by using its best efforts	Bid specification is clear and shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
187	2	62.1	Force majeure is herein.....government authority.	We request to owner to add following text into this clause : f) Riots, Lockouts, strikes, unavailability of labour and local disturbance around project site.	Bid specification is clear and shall prevail
188	2	62.1e)	Confiscation, nationalisation, mobilisation, commandeering or requisition by or under the order of any govt. of de jure or de facto authority or ruler or any other act or failure to act of any local or state or national government authority.	Kindly clarify the extent of the conditions covered under this clause.	Bid specification is clear and shall prevail
189	2	64	Arbitration	We request to stipulate uniform acceptable arbitration procedural rule, law and place in all proforma (DJU, Consortium) and also in the three Contract Agreements. We propose that the appointment of Arbitrators & Arbitration procedural rule shall be as per institutional rule of ICC, LCIA or equivalent.	Bid specification shall prevail
190	2	64	Arbitration - Arbitrator is ex-employee of owner and Cost of arbitration is equally shared by parties.	We request that the appointment of Arbitrators & procedural rule shall be as per institutional rule of ICC, LCIA or equivalent. Please refer to our above comment on arbitration.	Bid specification shall prevail
191	2	64.3	Arbitration	In case the Indian bidder is an Indian Public Sector Enterprise/Government Department, the dispute arising between the Purchaser and the Contractor shall be referred for resolution to a Permanent Arbitration Machinery (PAM) of the Department of Public Enterprise, Government of India. This is in line with the directives issued by Government of India to all Central PSUs.	Bid specification shall prevail

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
192	2	64.3	Constitution of Arbitration Tribunal	We request Owner to consider Constitution of Arbitration Tribunal and arbitral proceedings in accordance with the provisions of the Arbitration and Conciliation Act 1996 and the rules thereunder, as amended from time to time	Mahagenco shall revert separately
193	2	64.3.3	Selection of Arbitrators	The arbitration panel would be three arbitrators, comprising one each to be appointed by the Owner and the Contractor, and the third arbitrator (presiding arbitrator) to be appointed by such two arbitrators within thirty (30) days of the appointment of the second arbitrator.	Mahagenco shall revert separately
194	2	64.5.5	Where the arbitral award is for payment of money, no interest shall be payable on whole or any part of the money for any period till the date on which the award is made.	Please add: However, regarding any payments, including the interest on delayed payments, the decision of Arbitration Panel shall be final.	Bid specification shall prevail
195	2	New clause		The GCC does not have provision for Change in Law. The same may please be added	Bid specification shall prevail
196	2A	2.1	Quality Plans for critical equipments	The contractor will submit the quality plans for all critical equipment, alongwith the bid. You would kindly appreciate that the quality plans shall have bearing on time and cost of the contract therefore, the QPs submitted alongwith the tender shall be followed by the contractor.	Bid specification shall prevail

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S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
197	2A	2.1.1	The list of major equipment/materials for which the quality plan shall be submitted by the contractor shall be finalised during the kickoff meeting or a meeting specially organised for this purpose. The owner reserves the right to add/delete any item in/from such list during the period of currency of the contract but before the predespatch inspection of such equipment	Items are required to be listed/mutually agreed prior to contract which becomes the guide to execute, any change can be mutually agreed only prior to start of manufacture. Please clarify.	Bid specification shall prevail

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
198	2A	2.1.2	Immediately after finalisation of the source but before taking up the equipment for manufacturing, the contractor shall submit the quality plan of the equipment to be manufactured which shall indicate the special characteristics of the equipment/component/input materials to be used for manufacturing the same, quality checks proposed, nature and frequency of the same, acceptance norms, records to be maintained, customer hold points etc. However, the owner reserves the right to modify the quality plan including customer hold points before the respective manufacturing stage is completed.	The delivery schedules are based on Manufacturing Quality Plans mutually agreed/approved with identified Customer Hold Points. Any change thereafter will alter the project schedule. Please clarify.	Bid specification shall prevail

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
199	2A	3.2.2	Indigenous supplies: The contractor, at least one month prior to expected date of attaining the respective stage of manufacturing/readiness of the goods, shall submit the inspection call indicating the date of inspection to the controller of the quality appointed by the owner/IIA under intimation to the controller of quality.	Conflict in clauses: Vol IV-B Sec-1 Page 17 of 457, Clause 5.3.1 All Tests shall be performed in presence of owner/purchasers representative. If so desired by the purchaser. The contractor shall give at least seven (7) days advance notice of shop tests. Vol II, sec-7, Page 156 of 555, clause 4.2 The contractor shall give the engineer/inspector fifteen (15) days written notice of any material being ready for testing. For Domestic supplies :Inspection call may be raised 7 days prior to date of inspection as one month notice may not be realistic.	Provisions of clause No. 3.2.2, Section 2A, Volume-I shall prevail
200	2A	3.2.3	Inspection by Owner	The Owner / IIA to ensure that they visit for inspection on the date and time requested by the contractor.	Bid specification shall prevail

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Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
201	2A	3.3.1	Offshore Supplies: 3.3.1 Inspection at customer hold points shall be carried out by the Independent Inspection Agency (IIA) of international repute and having presence in the country where inspection is to be carried at the offshore works of contractor/subcontractor. Such agency shall be appointed by the contractor on prior approval of the owner. All the costs of appointing such agency shall be borne by the contractor.	Please clarify if Contractor appointed Inspection agency whom approved by Owner is changed to Owner's inspector/ Owner's representative, then all the charges including traveling, boarding and lodging charges of Owner's Inspector/Owner's representative shall be borne by the Owner.	Bid specification is clear & self explanatory

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
202	2A	3.3.4	Offshore supplies: The contractor atleast two months before the expected date of attaining such stage of manufacturing/readiness of goods,shall intimate the chief engineer(P&P).The Chief engineer(P&P) within twenty one days from the date of receipt of such intimation,shall revert confirming owners intentions of the owner to witness such tests or otherwise.In the event,the owner intents witnessing such tests,the contractor shall extend all his co-operation for arrangement of visa etc.	Conflict in clauses: Vol IV-B Sec-1 Page 17 of 457,Clause 5.3.1 <i>All Tests shall be performed in presence of owner/purchasers representative.If so desired by the purchaser.The contractor shall give at least seven (7) days advance notice of shop tests.</i> Vol II,sec-7,Page 156 of 555,clause 4.2 <i>The contractor shall give the engineer/inspector fifteen (15) days written notice of any material being ready for testing.</i> Inspection Call may be raised 15 days prior to the date of inspection as two months notice may not be realistic.	Provisions of clause No. 3.3.4 Section 2A, Volume-I shall prevail
203	2A	4	Despatch clearance	Please confirm that this clause is applicable only for those items which involve CHP during inspection. Other items shall not require Despatch clearance.	Pl refer corrigendum No.III
204	2A	8.1.1	Customs Duty	We request that customs duty as applicable on imported goods which are despatched directly to site are paid by Owner directly to the customs authorities, as Owner is the importer of such goods. This shall also apply to goods manufactured in a factory located in a SEZ area	Bid specification is clear in this regard and shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
205	2A	8.1.1 8.2.1	The customs duty including all the duties payable to the customs as on the date of clearance of materials/equipment imported by the contractor/sub-contractor to be directly delivered at site and to be supplied against this contract shall be reimbursed to the contractor at the rates applicable for the Project Imports against documentary evidence admissible as per the statute in force. Excise Duty and Cess/surcharge thereon if applicable, payable on the materials manufactured and supplied by the contractor against this contract shall be paid to the contractor at the rates applicable as on date of shipment against the excise invoice submitted by the contractor.	Please clarify that the all applicable taxes on the procurement of Raw Material / components from India or abroad by the Indian Contractor / Subcontractor and to be used for manufacturing operations shall also be reimbursed by the Owner against documentary evidence, in case the exemption of advance authorisation is withdrawn by the Government under the Change in Law.	Mahagenco shall revert separately
206	2A	8.2.2.	Excise Duty and Cess thereon:	We understand that Excise Duty and Cess/ surcharge will be reimbursed for all Direct Dispatch items to Site irrespective of whether it is dispatched by Contractor from its works and/ or from its sub-vendors/sub-suppliers works.	Bid specification is clear in this regard

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
207	2A	8.3 8.8	CST reimbursement	There are contradicting statements on CST reimbursement for materials dispatched directly from the sub-contractor's / sub-vendor's works to Site. As per Clause no. 8.3, such CST will be reimbursed, however in this Clause 8.8 the same is not reimbursed. Request you to kindly clarify.	Pl refer corrigendum No.III
208	2A	8.3.2	Central Sales Tax (CST)	We understand that Central Sales Tax will be reimbursed for all 6(2) sales transactions.	Bid specification is clear
209	2A	8.1	Customs Duty	We request Owner to consider High Sea Sales for supply of imported equipment & materials to be directly delivered to Site.	Pl refer corrigendum No.III
210	2A	9	Statutory variation in Taxes and Duties	We request that this provisions of this clause shall also apply for any change in rates of Taxes/ duties or or any change in interpretation or application of any Tax occurs in the course of the performance of Contract, which was or will be assessed on the Contractor in connection with performance of the Contract	Clause No. 8, Section 2A is clear & self explanatory
211	2A	12	Terms of Payment	Please confirm that the payment shall be made in the currency of the contract.	Pl refer corrigendum No.III
212	2A	12.0	Payment Terms	We understand that Owner will make payments in the quoted currencies. Kindly confirm.	

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
213	2A	12	Terms of Payment	The terms of Payment proposed by the owner has very high retention component. We request owner to adopt 'terms of payment' being followed in NTPC Contracts and other reputed power utilities for similar sized projects. We request owner to amend terms of payment as follow : <u>Supply of Equipment:</u> 1. Advance Payment - 15 %. 2. Dispatch of Equipment - 60% 3. Reciept at site - 15 %. 4. Synchronization - 5% 5. Commercial Operation - 5%	Mahagenco shall revert separately
214	2A	12	Mode of payment is not mentioned	kindly enlighten us on the mode of payment. Bidder requests for LC payment for all payments except Advance Payment (through TT)	Pl refer corrigendum No.III
215	2A	12.0	Payment Terms - Imported Supplies - Main equipment & Mandatory Spares	Please check to include Letter of Credit as the mode of payment for Imported supplies (Main equipment & Spares) as being adopted by many reputed power utilities like NTPC	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
216	2A	12.0	Payment terms & Interest for late payment	The stipulated payment terms will lead to negative cashflow for the bidder and request to consider the following: cl. 12.2.1 Advance payment may please be increased to 12% of supply price Further, additional advance payment of 15% of the supply price may please be paid at end of 6 months from date of LOA Cl. 12.3.1: this payment may please be paid against despatch. Accordingly, in clause 12.3.1a)v) replace with Original Bill of Lading, and in clause 12.3.1b)v) replace with LR/ Rail Receipt. We request all payments except initial advance be payable against irrevocable letter of credit established in the name of the Contractor, within 30 days from date of LOA. We also request the client to stipulate % interest on late payment. 12.3.3 The retention of 30% payment is extremely on higher side and therefore would request you to reduce it to 20% out of which we recommend	Mahagenco shall revert separately
		continued		milestone payment at clause 12.3.4 to be 15% out of which item 12.3.4 viii) should be 2.5% and final payment at PG test at clause 12.5.1 as 5%. Please confirm	continued as above
217	2A	12.10	Currency of Payment- All payment will be made in INR.	We request the Client to make any payments under all Contract Agreement in the respective currency of bidders quote.	Pl refer corrigendum No.III

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
218	2A	12.3	Due date for payment : within 30 days	Please inform how the contractor shall be compensated if the payments not received by him with in 30 days from submission of bills with desired documents.	Bid specification shall prevail
219	2A	12.4	Payment Terms - Imported Supplies - Main equipment & Mandatory Spares	Please include Letter of Credit as the mode of payment for Imported supplies (Main equipment & Spares) as being adopted by many reputed power utilities including NTPC	Bid specification shall prevail
220	2A	16	First contract: includes goods of Indian origin and of foreign origin and despatched directly to site	Please confirm that for goods of foreign origin and despatched directly to site, sale on high seas shall be effected	Pl refer corrigendum No.III
221	2B	27	Terms of Payment	The terms of Payment proposed by the owner has very high retention component. We request owner to adopt 'terms of payment' being followed in NTPC Contracts and other reputed power utilities for similar sized projects. We request owner to amend terms of payment as follow : <u>Installation & Civil Services :</u> 1. Advance Payment - 10 %. 2. Prorata Payments - 80% 3. Synchronization - 5% 4. Commercial Operation - 5%	Mahagenco shall revert separately
222	2A	12.0	Construction of Contracts and Payment terms of different Contracts	There is no separate contract and payments for Civil Works defined although additional Conditions for Civil Works in Section-2C have been specified. As you may appreciate the tax structure of Civil Contract shall be different than other Site services viz. Erection & Commissioning. Please clarify whether there will be a separate contract for Civil Works.	Bid specification is clear in this regard and shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
223	2A	11.12.1	The deliveries of Mandatory Spares and Special Tools & Tackles shall commence from the date of first synchronisation of the unit and shall be completed on or before the date of taking over the unit	The spares and tools and tackles shall be supplied alongwith the main equipment. It is not possible to complete the supplies of all spares of the entire EPC project with in a period of 2-3 months.	Bid specification shall prevail
224	2A	12.1.4	The payment shall be released by the Project manager or the financing institute(s) with whom the owner has tied up the funding for this project.	We request Owner to consider payment through Letter of Credit At Sight for Supply Contract excluding advance payment.	Bid specification shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
225	2A	12.2.1 (iii)	A copy of the acceptance of the contract performance security issued by the owner/ the Project manager.	We request Owner to remove acceptance of Bank Guarantee condition and consider submission of Bank Guarantees as a pre-requisite for the release of the advance payment.	Bid specification shall prevail
		12.2.1 (iv)	A copy of the acceptance of the bank guarantee of equivalent amount submitted by the contractor against advance payment.		
		12.2.2 (iii)	A copy of the acceptance of the bank guarantee of equivalent amount submitted by the contractor against advance payment.		
		12.2.3 (iii)	A copy of the acceptance of the bank guarantee of equivalent amount submitted by the contractor against advance payment.		
226	2A	12.2.1.ii i & iv, 12.2.2.ii i, 12.2.3.ii i	Release of payment in 30 days after acceptance of CPG and ABG	The acceptance procedure is internal to MahaGenco. Hence these two clauses may please be deleted.	Bid specification shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
227	2A	12.2.5	Interest on unadjusted advance	Please confirm that interest on unadjusted advance shall not be charged if the delays are attributable due to force majeure conditions or due to reasons not attributable to the contractor.	Bid specification is clear & self explanatory pl refer clause no.62.0
228	2A	12.3.1	Payment against Supply of Materials/Equipments	The present payment terms links the entire payment (Offshore & Onshore) on receipt of material at site. Instead we suggest the Owner to consider the following : 70% of the Ex-works / CFR supply price minus advance adjustment on prorata basis along with 100% taxes & duties to be paid on prorata basis within 30 days from the date submission of documents as list in clause 12.3.1 a) and b) respectively for Offshore & Onshore supplies expect for (v) i.e. "Copy of Stores receipt Note (SRN) issued by Owner's Site Authority". 10% of the Ex-works / CFR supply price to be paid on prorata basis within 30 days from date submission of "Copy of Stores receipt Note (SRN) issued by Owner's Site Authority". We request Owner to kindly modify the clause accordingly.	Mahagenco shall revert separately
229	2A	12.3.1	70% of the Ex-works.....Owner's site authority & 70 % of the basic contract price.....included in invoice.	In case owner delays release of payments, the contractor shall be given interest on delayed payments @ SBI Retail Prime Lending Rate.	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
230	2A	12.3.1.a. v 12.3.1.b .v	Payment on issue of SRN	In case site receipt note is not issued with in 3 days of submission of request by the Owner, then the bills may please be paid without the requirement of SRN	Bid specification shall prevail
231	2A	12.3.3	30% payment shall be retained.	In line with our request above for 80% payment on completion of supplies, we request Owner to consider retention of 20% instead of 30% specified in the tender. Kindly consider.	Mahagenco shall revert separately
232	2A	12.3.4	Milestone Payments	We request Owner to consider Total Milestone payments of 15% instead of 20% specified in the tender as below : i) Commissioning of DM Plant - 1% ii) Boiler Light up - 1% iii) Commissioning of Cooling Tower and CW System - 2% iv) Commissioning of WTP and STP - 2% v) Synchronisation of the Unit - 2% vi) Commissioning of CHP and AHP - 2% vii) Coal Firing of Unit on achieving 'vi' above - 2.5% viii) Completion of successful trial operation - 2.5%	Mahagenco shall revert separately
233	2A	12.4.1	Supply of Mandatory Spares, Special Tools & Tackles	We request Owner to consider 95% payment as against 90% mentioned in this clause	Bid specification shall prevail
234	2B	12.5.1 27.4	Final Payment against Supply of Equipment/material and Mandatory Spares Final Payment against Services Rendered	In line with the Payment terms requested above, the final payment shall be 5%. Request the Owner to kindly consider.	Bid specification shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
235	2B	12.7 27.5	Payment of Price Adjustment:	We request Owner to release payments for price adjustment in line with the payment terms of Supply/ Mandatory Spares/ Services/ Site Works, as applicable.	Bid specification shall prevail
236	2A	12.7.2	Payment of Price Variation on completion of milestones	Since the exact amount of price variation is not known till the end of the contract, billing of PV against completion of milestones may not be possible. Therefore it is requested that only 10% of the Price variation may be paid as per clause 12.5 and balance 90% may be released in clause 12.7.1, which may be modified accordingly	Bid specification shall prevail
237	2B	4.2.1	Electricity : The contractor shall be provided with supply of electricity for construction purpose at one point.....The contractor shall make his own further distribution arrangement.the supply of electricity shall be on non-chargebla basis.	Bidder requests client to supply additional 2 nos point of Electricity source nearer to staff & labour Colony at free of Cost	Bid specification shall prevail
238	2B	4.3.1	Supply of water for construction and potable use shall be made available at one point each at the location decided by the project manager. The contractor shall make further distribution arrangements thereafter at his own costs.	We understand that the location shall be inside the project site. Kindly confirm.	Bid specification is clear in this regard

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
239	2B	4.3.1	Water: 4.3.1-Supply of water for construction & portable use shall be available at one point Further distribution arrangement thereafter at his own cost 4.3.2 -The supply of water together with taxes and duties if any levied thereon shall be free of cost.water is one of the most precious resource	Bidder requests client to supply additional 2 nos point of portable water source nearer to staff & labour Colony at free of Cost	Bid specification shall prevail
240	2B	4.5.1	The owner will allow the contractor to use the railway siding facilities and shunting locomotive (when construction in the vicinity of the owner's existing Power Station) for unloading of material and equipment despatched against the contract as and when available without any charge.	Kindly confirm that the loco operator (subject to availability) shall also be provided to the contractor without any charge	Pl refer corrigendum No.III
241	2B	7.1	If the Works of the contractor is delayed because of any acts or omission of another contractor, the Contractor shall have no claim against the owner on that account other than an extension of time for completing his works.	For bidder, work done by the other contractor shall be as if it is done by the Owner. If the bidder's work is delayed due to other contractor, he should be compensated with time and money.	Bid specification shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
242	2C	12.1	The owner reserves the right to make any changes in the designs and plans of the works and the contractor shall be bound to carry them out. <u>No claim or compensation would be allowed on this account.</u>	Please clarify the relevance of this clause as this is a contradiction to the Variation clause (Clause 17.1 - Power to Order Variation)	Bid specification is clear in this regard
243	2B	23.3	Except for the Service Tax, no tax shall be payable to the contractor on the services rendered against this contract.....	We request Owner to clarify regarding reimbursement of "Construction Cess" applicable as per BOCW Act.	Pl refer clause No. 27.8 in this regard
244	2B	24	Statutory variation in Taxes and Duties	We request that this provisions of this clause shall also apply for any change in rates of Taxes/ duties or or any change in interpretation or application of any Tax occurs in the course of the performance of Contract, which was or will be assessed on the Contractor in connection with performance of the Contract	Clause No. 23, is clear & self explanatory
245	2B	24	Statutory variation in Taxes and Duties	We request that this provisions of this clause shall also apply for any change in rates of Taxes/ duties or or any change in interpretation or application of any Tax occurs in the course of the performance of Contract, which was or will be assessed on the	Bid specification shall prevail
246	2B	27.0	Payment Terms	Kindly confirm that the Payment Terms specified in this clause is applicable for both the Second Contract i.e. Services Contract and the Third Contract i.e. Civil, Structural & Architectural works	Pl refer corrigendum No.III

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
247	2B	27	Construction of Contracts and Payment terms of different Contracts	There is no separate contract and payments for Civil Works defined although additional Conditions for Civil Works in Section-2C have been specified. As you may appreciate the tax structure of Civil Contract shall be different than other Site services viz. Erection & Commissioning. Please clarify whether there will be a separate contract for Civil Works.	Pl refer corrigendum No.III
248	2B	27.3.1	Payment towards Services Rendered	As services payment is done on prorata basis on completion of milestones, hence we request Owner to only keep retention of 5% towards PG test and withdraw the retention of 20% towards various Milestones. To summarise, we are requesting Owner for 95% payment minus advance adjustment together with Service Tax on prorata basis within 30 days for Services. Kindly consider. We feel that (ii) Packing slip for each consignment is wrongly mentioned here. We request Owner to replace it with "(ii) Certificate certifying the completion of work claimed in invoice". Kindly confirm.	Bid specification shall prevail
249	2B	27.3.1	70% of the Ex-works.....Owner's site authority & 70 % of the basic contract price.....included in invoice.	In case owner delays release of payments, the contractor shall be given interest on delayed payments @ SBI Retail Prime Lending Rate.	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
250	2B	27.3.1	70% of the Basic Contract value as per the approved billing breakup minus advance adjustment on prorata basis (e.g. 60% if advance paid till then is 10%) together with service tax thereon shall be paid on prorata basis within 30 days from the date of submission of the invoice and related documents as mentioned	Please clarify the event upon fulfillment, this payment shall be due.	Bid specification is clear & self explanatory
251	2B	27.3.3	30% payment shall be retained and out of which be released on achievement of important milestones in the project 20% payment shall completion as stipulated below	We request Owner to release 5% payment on PG Test. Kindly consider.	Bid specification shall prevail
252	2B	36	The entire work.....shall be firm.	Suitable compensation shall be given to the contractor on weekly basis for any/all non fulfilment of owner's obligation. The amount of compensation shall be mutually agreed between owner and contractor.	Bid specification shall prevail
253	2B	36.2	Free over run period of 6 months	There will not be any free over run period. The contractor has to spend on each and every day in the over run also apart from delay in receipt of the deferred payments. Hence please deleted this clause.	Bid specification shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
254	2B	36.2	The Contractor shall not be liable for any compensation if the works get prolonged for <u>6 (six)</u> months beyond the contract period due to the non-fulfillment of the obligations on the part of the Owner and this 6 (six) months period will be treated as free over run period to the Owner.	please modify as follows; The Contractor shall not be liable for any compensation if the works get prolonged for <u>1 (one)</u> months beyond the contract period due to the non-fulfillment of the obligations on the part of the Owner and this 1 (One) months period will be treated as free over run period to the Owner.	Bid specification shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
255	2B	36.2	The Contractor shall not be liable for any compensation if the works get prolonged for 6 (six) months beyond the contract period due to the nonfulfillment of the obligations on the part of the Owner and this 6 (six) months period will be treated as free over run period to the Owner.	We request owner to delete the sub-clause as the same is not in line with the standard contract conditions prevailing in the industry.	Bid specification shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
256	2B	36.2 36.3	The Contractor shall not be liable for any compensation if the works get prolonged for 6 (six) months beyond the contract period due to the non-fulfilment of the obligations on the part of the Owner and this 6 (six) months period will be treated as free over run period to the Owner. The Contractor shall be liable for compensation, only if the contract period gets extended beyond 6 (six) months from the scheduled date of completion due to non-fulfillment of the obligations by the owner/or his authorised representative/other agencies under his control at the rate of INR 1,500,000/- (In words INR One Million Five Hundred Thousands only) per month and prorata for part of the month. This rate shall be firm.	Please clarify the justification behind free 6 months overrun period requested by the Owner and thereafter INR 1,500,000 / month as the compensation charges for such overruns.	Bid specification shall prevail
257	2B	36.3	Compensation of Rs. 15,00,000/- per month and pro-rata for part of the month	This amount is too less. Kindly consider a payment equivalent to the LD amount.	Bid specification shall prevail

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
258	2B	36.3	~, only if the contract period gets extended beyond <u>6 (six)</u> months ~ at the rate of <u>INR 1,500,000/- (In word INR One Million Five Hundred Thousands only)</u> per month and prorata for part of the month. This rate shall be firm.	Please modify as follows; ~, only if the contract period gets extended beyond <u>1 (one)</u> months ~ at the rate of INR 22,500,000/- (In word INR Twenty Two Millions and Five Hundred Thousands only) per month and prorata for part of the month. This rate shall be firm.	Bid specification shall prevail
259	2B	36.3	The Contractor shall be liable for compensation, only if the contract period gets extended beyond 6 (six) months from the scheduled date of completion due to non-fulfillment of the obligations by the owner/or his authorized representative / other agencies under his control at the rate of INR 1,500,000/- (In words INR One Million Five Hundred Thousands only) per month and prorata for part of the month. This rate shall be firm.	As requested above, we request for deletion of the "no compensation up to 6 months extension due to non-fulfillment of obligations by the Owner". Further, the expenses incurred by the Contractor for such extension may vary based on the project execution stage and hence cannot be fixed at Rs. 1,500,000/-. We suggest that for such extensions the compensation shall be at actuals to be established through documentation. Kindly confirm.	Bid specification shall prevail
260	2B	37.4	Unless all material are removed and clear space is handed over back to the owner, the final bill payment as well as release of contract performance security shall not be considered by the owner.	Please delete this clause as release of performance security and release of last payments are not linked with closing of site office	Pl refer corrigendum No.III

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CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
261	2C	3.1	Facilities for other contractors	This is applicable only for work connected with the unit-6 and not for the existing units.	Bid specification is clear in this regard
262	2C	6.1	Compensation for all damage done intentionally or unintentionally by contractor's labour whether in or beyond the limits of the owner properly shall be estimated by the Engineer-in-charge,.....	Kindly clarify the "all damage done intentionally or unintentionally by contractor's labour whether in or beyond the limits of the owner"	Bid specification shall prevail
263	2C	9.1	In the case of any work for which there is no specification as is mentioned, such a work shall be carried out in accordance with the Divisional specifications and in the event of there being no Divisional specification the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-charge.	Kindly clarify the "Divisional Specification"	In case of any work for which there is no specification as is mentioned in the Bid Documents, the same shall be carried out in accordance with the specifications laid down by PWD, Irrigation and MJP Departments and as per IS guidelines.
264	2C	12.1	The owner reserves the right to make any changes in the designs and plans of the works and the contractor shall be bound to carry them out. No claim or compensation would be allowed on this account.	We request Owners to compensate the contractor on cost & time impact due to such change in the designs by owner.	Bid specification shall prevail
265	2C	17	Variations	Please clarify the clause in case of omit / vary of work by Client on contract price, schedule and performance	Bid specification is self explanatory

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
266	2C	18	Variations	Please clarify the clause in case of omit / vary of work by Client on contract price, schedule and performance	Bid specification is self explanatory
267	2C	20.6	The contractor shall submit reconciliation statement of steel/cement/ other materials used by him and incorporated in the work once in every <u>three (3) months (quarter)</u>	Please explain the purpose of this quarterly reconciliation	Pl refer corrigendum No.III
268	2C	-	Taxes and Duties / Payment Terms	Kindly incorporate a suitable clause for Taxes and Duties including Work Contracts Tax (WCT) if applicable and Payment Terms related to the Civil Contract.	Bid specification is clear in this regard
269	3	1.3	Availability Guarantee	Please delete this clause as The availability of the plant depends on lot many factors other than the equipment.	Bid specification shall prevail
270	3	1.3	The Contractor shall guarantee 90% availability of the plant for one (1) year from the date of trial operation. In case this is not achieved, such period shall be further extended to one year from the date of repair of the equipment, until such availability is achieved till such time Contract Performance Security shall required to be extended. The Contractor shall maintain full fledged supervisory staff until such period.	Please delete clause 1.3; Availability of a power plant depends solely on O&M schedule of the Owner, which cannot be interfered by Contractor. Contractor's liability shall be limited to Defect Liability and Latent Defect after Taking Over.	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
271	3	1.3	The contractor shall guarantee 90% availability of the plant for one (1) year from the date of trial operation. In case this is not achieved, such period shall be further extended to one year from the date of repair of the equipment, until such availability is achieved till such time Contract Performance Security shall required to be extended. The contractor shall maintain full fledged supervisory staff until such period.	We request Owner to furnish formula for calculating availability for our understanding.	Pl refer MERC regulations in this regard
272	3	2	Provenness Criteria	Mahagenco has a supercritical project under execution and hence we suggest to replicate proveness criteria of that project (for both BTG and BoP) in this Bhusawal Project. Kindly consider.	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
273	3	2	Proveness criteria	Bidder requests client to add the following clause in continuation to clause 2.2 and clause 2.3: A JV company / subsidiary company formed for manufacturing and supply of equipment(s) listed at 2.2 above in India, can also manufacture such equipments provided one of its promoters/its subsidiary(ies) / holding company meets the requirements of clause 2.2 above. However, in such a cas, the JV company /subsidiary company formed for manufacturing of equipment(s) listed under 2.2 above should have a collaboration or valid licensing agreement for design, engineering, manufacturing of such equipment(s) in India with the JV promoter/its subsidiar(ies) / holding company who meets the requirments stipulated at clause 2.2 above.	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
274	3	2.3	Other critical equipment, auxiliaries, systems and bought out items in STG package	The current clause 2.3 may be renamed as 2.3 i) and add the following after this clause " 2.3 ii) A JV company / subsidiary company formed for manufacturing and supply of equipments listed at clause 2.1.2 clause 2.2.3 above in India can also manufacture such equipments provided one of its promoters / its subsidiaries / holding company meets the requirement at clause 2.1.2/ 2.2.3 above. However in such a case the JV company / subsidiary company formed for manufacturing of the equipments listed under clause 2.1.2 / 2.2.3 above should have collaboration or valid licensing agreement for design, engineering, manufacturing of such equipments in India with JV promoter /its subsidiaries / holding company who meets the requirement stipulated at clause 2.1.2 / clause 2.2.3 above Before taking up the manufacturing of such equipments as per above clause, the bidder / his subvendors must create (or should have created) manufacturing and testing facilities at his works as per collaborator / licensor's design, manufacturing and quality control system for such equipments	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
		continued		duly certified by the collaborator / licensor Further, the collaborator / licensor shall provide (or should have provided) all design, calculations, manufacturing drawings and must provide (or should have provided) technical and quality surveillance assistance and supervision during manufacturing, erection, testing, commissioning of equipments"	continued as above
275	3	2.3	Incase the contractor or the proposed sub - vendor(s).....atleast 500 MW rating, the contractor or proposed sub vendor (s) stipulated at clause 2.1 and 2.2 above. However, in this case, the contractor.....commisisioning of equipment.	Bidder requests Client to amend the criteria/clause as follows. Incase the contractor or the proposed sub - vendor(s).....atleast 150 MW rating, the contractor or proposed sub vendor (s) stipulated at clause 2.1 and 2.2 above. However, in this case, the contractor or proposed sub- vendors before resorting to design, engineering, manufacturing of proposed equipment by himself or themselves should have created manufacturing facilities at his works as per collaborator/licensor's design, manufacturing and quality control system for such equipment. Further, the collaborator/licensorcommisisioning of equipment.	Bid specification shall prevail
276	3	4.0	Deemed Export Benefits	A recent Notification No. 107 (RE-2010)/2009-2014 dated 21st March, 2012 issued by Director General of Foreign Trade states that supplies to non Mega Power Project shall not be entitled to any Deemed Export benefit. In view of this circular, kindly confirm whether Deemed Export benefit needs to be considered for this project.	Mahagenco shall revert separately

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
277	3	4.5	Any change in the rate(s) of above duty(ies) applicable to the goods supplied to the project with respect to their rates as on record date due to change/expansion/abolition/withdrawal of the Deemed Export Benefits and/or Mega Power Project Policy benefits during contractual work completion period and extended contractual work completion period for the reasons attributable to the owner, if any, shall be to the owner's account. However, in the event of the such change taking place beyond the contractual work completion date, minimum of the rate applicable as on record date or as on the date of incidence of the duty shall only be payable.	In addition to the condition specified in this clause, reimbursement of statutory variations shall also be applicable in case of extension of contractual completion period due to force majeure conditions. Kindly confirm	Pl refer corrigendum No.III
278	3	5.1	All the goods to be supplied by the domestic contractor shall be consigned to: (----- name of the contractor-----) C/o. Chief Engineer /Dy. Chief Engineer (Project) Maharashtra State Power Generation Co. Ltd. Bhusawal Thermal Power Station Project Bhusawal, Dist. Jalgaon (MS) Pin - 425307	Kindly clarify the invoicing route in this case. For items which shall be self manufactured by the Contractor, if the consignee is self @ site as specified, it shall be treated as Stock Transfer and then the final sale to Owner shall be a VAT transaction, which is not the tax optimized transaction.	Mahagenco shall revert separately

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
279	3	6	Liquidated Damages	LD cap for delay in completion is not mentioned, so we would like to suggest that LD cap for delay in completion of the Project shall not exceed 10% of contract Price. And Overall aggregated LD 25% is high, please change Overall aggregated LD (total LD for Performance and LD for Delay) from 25% to 15% of Contract Price	Bid specification is clear in this regard and shall prevail
280	3	6.3	Rate of liquidated damages against shortfall in performance	Owner may consider rationalisation of the rates at the LD for shortfall in performance shall be levied as these rates are quite high. Similar rationalisation is requested in Clause 19.1 of Section-1, Volume-1 of tender specifications	Bid specification shall prevail
281	3	6.3	List of Auxiliaries for Guaranteed Power Consumption	The MD BFP is not a continuous running equipment. Hence S. No. 1 may be deleted from the list of auxiliaries to be considered for guaranteed auxiliary power consumption	Pl refer corrigendum No.III
282	3	6.3	Auxiliary power consumption	Since AHP involves dry ash disposal system, wet ash disposal system and HCSD, please clarify for Auxiliary power consumption which system we have to consider. Please clarify whether we have to consider ventilation, sump pumps, hoists.	Bid specification is clear in this regard
283	3	6.3	Auxiliary power consumption	Please clarify for Auxiliary power consumption which path (direct, stacking, reclaiming) we have to consider, whether single stream operation or double stream operation. Please clarify whether we have to consider ventilation, DE/DS system, sump pumps, hoists, elevator.	Bid specification is clear in this regard
284	3	6.3	Liquidated Damages for failure to meet Performance Guarantees	We request Owner to review the LD rates for failure to meet Performance Guarantees and rates considered for loading of Price Bid on Performance Parameters (as specified in Clause 19, Section 1).	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
285	3	6.3	Heat Rate: Increase in gross turbine cycle heat rate in kCal/kWh under rated steam conditions at 76 mm of Hg (back pressure) with zero make up at 100% unit load at generator terminals.....	Since this is an EPC contract, Owner is requested to give the Bidder freedom to choose the best condenser back pressure based on most optimized design for offering the best heat rate for the turbine. Owner may please consider and give their acceptance.	Bid specification shall prevail
286	3	6.3	Guaranteed Technical Parameters and LD for failure to meet performance guarantees - TG Cycle Gross Heat rate and SG efficiency	This being a turnkey EPC tender, we request that the performance guarantee is requested on Unit Gross Heat rate basis which incorporates the TG Cycle HR and SG efficiency	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
287	3	6.3	Auxiliary Power Consumption: Total auxiliary power consumption of all auxiliaries (as listed below) at 660 MW load with Zero make up, 76mm of Hg back pressure and 100% unit load with respect to the guaranteed Auxiliary Consumption as per Schedule - 7.	(1) As per Vol II, Section 8 cl. no. 1.2.5 for Performance Guarantee Schedule, 1% make up to be considered for auxiliary consumption. Please clarify, Quantity of make up water (0% or 1%) to be considered for auxiliary consumption guarantees. (2) As per Vol. I, Sec 3, cl. no. 6.3 for LD and Vol. I, Sec 1, cl. no. 19.1 for Loading for Bid Price, Auxiliary consumption are given in per kWh basis, however as per Vol. I, Sec. 1, Schedule 7 for guarantee schedule 7, auxiliary consumption is to be guaranteed in kW. Please confirm the evaluation and guarantees shall be on per kW basis. (3) As per Vol. I, Sec 3, cl. no. 6.3 for LD and Vol. I, Sec 1, cl. no. 19.1 for Loading for Bid Price, the auxiliary consumption is to be considered at 100% TMCR condition, however in the description of list of auxiliaries to be considered (Vol. I, Sec 3, cl. no. 6.3), it is specified that the individual plant and equipment are to considered at full load/capacity / design capacity. Please clarify the requirement.	Auxiliary Power consumption shall be at zero % make up. Pl refer corrigendum No.III The auxiliary power consumption shall be considered at 100% TMCR at design condenser pressure with zero% make up.
288	3	6.3	Auxiliary Power Consumption table, Sl. No. 5 - Excitation losses (in case of static excitation system with rectifier transformer)	As per Specification Vol III-B, Section-1, Cl. No. 3.3, electrical power generated at generator terminal is to be considered subtracting power taken by the exciter for heat rate and output calculations. Hence, Bidder proposes to remove excitation losses from auxiliary consumption list.	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
289	3	8.3	Phased Manufacturing Programme - Weightages for different milestones of PMP & Bank Guarantee value to be submitted for PMP	As per CEA guidelines, the weightage factors shall be defined independently for Steam Generator & Steam Turbine i.e. the sum of weightages for individual equipment shall sum upto 100. Presently the bid documents stipulate combined weightages for Boiler & Turbine together which may please be amended. also pl. refer to clause 8.4	Bid specification shall prevail
290	3	9.1	Obtaining any clearance not mentioned therein, however, is required for completion of the work under this contract shall be exclusive responsibility of the contractor.	Any clearance not mentioned, but required for performance of the work under the contract should be obtained by such party in whose name the clearance/ permit/ authorisation is required to be obtained. We request you to kindly modify the clause accordingly	Bid specification shall prevail
291	3	6.3	LD for Guarantees	This being a turnkey EPC tender, we request that the performance guarantee is requested on Unit Gross Heat rate basis which incorporates the TG Cycle HR and SG efficiency	Bid specification shall prevail
292	3	2.2.2.3	"The generator to be supplied shall be manufactured assembled and tested in the factory where generator of at least 500 MW has been manufactured in the past or is under manufacturing / assembly at factory having testing facilities of international standard acceptable to technical agency / institutions to be approved by Owner	The clause may please modified to accommodate Indian manufacturing company set up to manufacture generators for supercritical projects Accordingly we request to you to add the following at the end of the para <i>"Alternately the same can also be manufactured in Indian Manufacturing Company set up as per clause 4.2.1 of Section 1 / Volume I"</i>	Mahagenco shall revert separately
293	3	2.2.3	Provenness Criteria of LPFWH: Capacity not less than 1300 MT/hr	Please modify as below: Feed Water Low Pressure Heater of a 500 MW or higher size unit	Mahagenco shall revert separately

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
294	3	2.2.3	Provenness Criteria of HPFWH: Capacity not less than 800 MT/hr for each string	Please modify as below: Feed Water High Pressure Heater of a 500 MW or higher size unit	Mahagenco shall revert separately
295	3	2.2.3	Provenness Criteria of LPFWH: Feed water handling Capacity not less than 1600 MT/hr	Please modify as below: Deaerator of a 500 MW or higher size unit	Mahagenco shall revert separately
296	3	2.2.3	Provenness Criteria of HP Bypass system	The HP Bypass Valves developed by us are suitable for both 500 MW sub-critical units as well as for 660 MW supercritical sets. These valves have been tested successfully at supercritical steam parameters and flow, temperature and pressure requirements and have been working for more than 2 years in 500 MW sets in the country. We interpret that our HP Bypass valves are proven. Kindly confirm.	Mahagenco shall revert separately
297	3	2.2.3	Feed water high pressure heaters - Capacity not less than 800 MT / hour for each string	Client to note that as per prevailing practice 2 x 50 % HP Heaters string can be offered. Please confirm	Mahagenco shall revert separately

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
298	3	2.4.1	Power cycle piping The contractor / his proposed sub vendors should have designed, engineered (including static and dynamic analysis) fabricated / got fabricated AND should have experience in fabrication and welding of main steam piping	The two conditions of this clause contradict each other as the 1st condition allows fabrication by others while the 2nd condition stipulates fabrication experience also We request you to delete the 2nd condition since fabrication is a specialised jobs done by fabricators/erection agencies Further We request you to add a new condition at the end of this clause In case the bidder / his sub vendor does not meet the requirements stipulated above in part or full but he is a regular piping design and engineering firm and currently carrying out the design and engineering plant units, may also be considered qualified provided he collaborates subcontracts / associates with a design firm / agency who meets the requirement of the clause above for the purpose of execution of design and engineering of power cycle piping system for this package. In such a case the bidder / its subvendors shall get the design / engineering documents as per technical specification duly vetted by his collaborator / sub contractor / associate for the part of design for which he is not qualified."	Mahagenco shall revert separately
299	3	2.4.4	Condensate Polishing Plant: The Contractor/subcontractor should have designed and supplied.....	Please replace "Contractor/subcontractor" with "Contractor/subcontractor or subcontractor's associate."	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
300	3	4.2.2	Exemptions in view of Mega Power Project Status: The owner has applied to Ministry of Power, GoI for issuance of the Mega Power Project Status for the Project. In the event the Project gets Mega Power Project Status, all the equipment, components, materials imported for the project shall be entitled for exemption of customs duty Whereas, if the project is awarded Expansion Unit of Existing Mega Power Project Status, Customs Duty is payable at the rate of 2.5%. However, in both the cases, Excise Duty is exempted.	We request Owner to note that Excise Duty is not exempted in case of – (a) materials going for the Civil works such as Cement, Steel (Reinforcement / Rebars) etc are not exempted either in case of Mega power project as well as in expansion Mega power project. (b) In case of Expansion Mega Power Projects exemption from Excise Duty for various systems such as Ash Disposal system, including Ash Dyke, Water intake including treatment and storage facilities and coal transportation facilities, etc. are also not available as per latest Excise Duty Circular No. 6/2011 dtd. 01.03.2011(Under Sl.No. 91C).	Mahagenco shall revert separately
301	-	-	Reference DG/BSL U-6/2011/T-1/0853 dated 3rd Feb 2012-AMENDMENT NO. 3 (IFB) Page 7 of 8, NOTES Sl. No. 2 " In case bid is submitted by the subsidiary company of the parent manufacturer where in the parent manufacturer holds equity not less than 51%.	Kindly clarify that the said clause (AMENDMENT NO. 3 (IFB) Page 7 of 8, NOTES Sl. No. 2) is applicable for joint Venture company as well.	Bid specification is clear & self explanatory in this regard

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
302		31.4	Price preference	We understand the cl as under: a) If the supply is quoted as CIF, it will be multiplied by 0.9 and increase this amount by 1.15 for purposes of evaluation. b) If the supply is quoted as CFR, it will be multiplied by 1.005 and increase this amount by 1.15 for purposes of evaluation. Pl clarify	Bid specification clear in this regard.
303	2B	27	Terms of Payment	The terms of Payment proposed by the owner has very high retention component. We request owner to adopt 'terms of payment' being followed in NTPC Contracts and other reputed power utilities for similar sized projects. We request owner to amend terms of payment as follow : <u>Installation & Civil Services :</u> 1. Advance Payment - 10 %. 2. Prorata Payments - 80% 3. Synchronization - 5% 4. Commercial Operation - 5%	Mahagenco shall revert separately

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
304	3 Vol II Section - 8	6.3 (1) 1.2.3	Heat Rate: Increase in gross turbine cycle heat rate in kCal /kWh under rated steam conditions at 76 mm of Hg (back pressure) with zero make up at 100% unit load at generator terminals with respect to guaranteed heat rate as per Schedule - 7. Guaranteed Turbine Cycle Heat rate in kCal/kWh under rated steam conditions, design condenser pressure with zero make up at 100% and 80 % rated load. A weightage of 4 (four) and 3 (three) shall be considered for 100 % and 80 % heat rate values for arriving at the net heat rate.	Please note that there is discrepancy in Performance guarantee schedule and Special Terms & Conditions of contract regarding Heat Rate. As Liquidated damages on Gross Heat Rate are at 100% unit load, we presume that Performance Guarantee for Heat Rate shall be only at 100% TMCR/0% MU Load. Kindly confirm.	Pl refer corrigendum No.III
305	General	27	Terms of Payment	Please ensure that the resolutions of Pre-bid queries raised against Terms of payments of Section 2A shall be applicable on Section 2 B also.	Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
306	General	All relevant clauses on taxes & duties and Price Variation	Payment beyond contractual completion dates	Please confirm that Price variation and statutory variation in taxes and duties shall be paid to the contractor for the supplies / work done beyond the contractual completion period, if the delay in work completion is either due to force majeure conditions or due to reasons attributable to the Owner.	Pl refer corrigendum No.III
307	General	General	Soft copy of schedules	Kindly provide us editable soft copy of all the schedules (to be filled by the contractor) in MS-Word format.	Pl refer clause no. 11.0, Section-I, Volume-I
308	General	General	Type Tests	The type tests conducted on similar equipment in past 5 years by the contractor shall not be conducted again for this project. Kindly convey your acceptance	
309	General	General	Type Tests	It is suggested to introduce a schedule of type tests, where the contractor may specify the rates for conducting type tests. MahaGenco may review the prices and select the type tests to be conducted at the time of placement of LOA	
310	General	General	General	Please confirm that in case of contradiction in the specifications / terms and condition specified in Volume-1 and other Volumes of the tender document, the details indicated in Volume-1 of the tender shall prevail.	
311	Nil	Nil	Other Major Conditions to include	Please include other major Clauses viz. Change in Law, Transfer of Title, Deemed Completion of PG Test / Project etc. in bid documents	

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT					
CLARIFICATIONS TO PRE -BID QUERIES					
Bid Specification No. DG/BSL U-6/2011/T-1, Volume - I					
S. No	Section No.	Clause No.	Bid Specification Stipulation	Bidder's query/Stipulation	MAHAGENCO Reply
312	Vol-II till Vol-VIII		Drawings, Annexures, Schedules & Datasheets provided in Tender document	We request Owner to provide these documents in editable formats.	Shall be provided by Mahagenco

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT

RESPONSE TO PRE - BID QUERIES

Bid Specification No. DG/BSL U-6/2011/T-1

VOLUME - II

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
1	Volume-II/Section-2	7.14	Rainfall data	Rainfall data provided 112mm average annually. Kindly provide rainfall intensity in mm/hr. to be considered for drainage calculation.	Rainfall intensity data shall be collected from Meteorological dept. by the bidder.
2	2	7.11	Seismic Zone : Zone III as per IS:1893	Our standard design fulfills the following seismic requirements: 0.4g in horizontal direction 0.27g in vertical direction with respect to accelerations acting directly on the generator, i.e. top of foundation where the generator is mounted. Any requirements above the standard ones would need an extra assessment. On project level (plant) there has to be done an evaluation of the site conditions regarding the seismic requirements on the top of the foundation where the generator is mounted. If the according seismic accelerations are determined, we are able to judge, if the requirements are fulfilled or if a project specific assessment is needed.	Bid specification prevails

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
				The generally required information to be provided for generator supplier is the following: - required method for seismic analysis, i.e. static coefficient method or dynamic method, - depending on method, there might be specified/prescribed additional scaling factors (e.g. load factors) or damping ratios, - classification of earthquake event and related safety factors on material properties: 7:E8) SSE (safe shutdown earthquake), b) OBE (operation base earthquake) - earthquake accelerations in horizontal (lateral and axial) and vertical direction at: a) footpoints of turbogenerator and b) centre of gravity of turbogenerator. Depending on method, accelerations to be given as scalar values or spectra. - earthquake load combination and superposition rules (e.g. combination of seismic loads with weighing factors or SRSS) - consideration of friction forces allowed? Bidder's request to confirm acceptance.D8	
3	2	7.13	Wind speed : 0 to 39 Km/hr	Kindly furnish the max. wind velocity to be considered for boiler design.	Basic wind speed is 39 m/s as per IS 875 part III
4	Vol -VI A Sec-1	4.6.6.2	The basic wind speed Vb at Bhusawal according to IS 875 (Part-3) -1987 is 39 m/s.		

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**Pre - Bid Queries****Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
5	Volume-II/Section-2 Volume-IV-A/Section-1 Volume-IV-A/Section-1	7.15 (II/2 4.2 (e) (Page 22)) 4.6.4 (c) (Page 75))	7.15: Wind Speed : 0 to 39 Km/hr 4.2 (e): Wind Speed : 0 to 44 Km/hr 4.6.4 (c) Wind Load : 39 m/s	As per IS 875 (Part III), the wind speed is 39 m/s. Please clarify the wind speed to be considered.	Basic wind speed is 39 m/s as per IS 875 part III
6	2	7.17	MAIN POWER SOURCE FROM GRID: 7.17 MAIN POWER SOURCE FROM GRID 7.17.1 Rated Voltage : 400kV 7.17.2 Voltage variation : ± 10 % 7.17.3 Frequency Variation : ± 5 % 7.17.4 Rated Short Circuit Level : 50 kA, Three Phase Symmetrical	As per CERC Grid Code Regulation No. L-1/18/2010-CERC dated 28-04-2010 and CEA Grid Standards 2010 the Voltage Variation of 400kV Grid is $\pm 5\%$ i.e. 380kV to 420kV, Frequency Variation is 49.2Hz to 50.3Hz. Bidder requests Client to verify and revise these values accordingly. The highest voltage for 400kV system is 420kV and major equipment designs will not conform to a voltage of 440kV(400kV +10%). Similarly Voltage Variation at Generator Terminals is $\pm 5\%$ and it would be outside P-Q capability of Generator to meet the voltage variation of $\pm 10\%$.	Refer Corrigendum II Master specification Volume - II .

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
7	2	7.18	Auxiliary Power Consumption: Total auxiliary power consumption of all auxiliaries (as listed below) at 660 MW load with Zero make up, 76mm of Hg back pressure and 100% unit load with respect to the guaranteed Auxiliary Consumption as per Schedule - 7.	Bidder's optimised and Standard ratings are: Motors above 1500kW-11kV Motors below 1500kW & above 200kW - 3.3kV Motors upto 200kW: 415V The above ratings lead to effective utilisation of voltages leading to optimised design of Electrical System.	Bid specification prevail
8	Volume II / Section-2	7.18.6 (a) Page- 22 of 555	Short circuit level for; 11kV switchgear: 44kA/3sec	We propose SC level for 11kV as 40kA/3S as most of the 11kV electrical equipment are available with 40kA SC rating.	Bid specification prevail
9	Sec-2	7.18.8(a)-ii	Alternate Power source(Emergency Power Supply) to Fire Water Pumps.	Emergency Power from Plant Main DG(MCC) will not be provided for Fire Water Pumps. However, Diesel engine driven Fire Pump will be provided separately under Fire Protection Package. Pl.confirm acceptance	Confirm
10	2	7.19	The variation in voltage and frequency may be $\pm 10\%$ and $\pm 5\%$ respectively. The combined voltage and frequency variation may be $\pm 10\%$. All devices shall be suitable for continuous operation over the entire range of voltage variation without any change in their performance	Bidder's understanding that mentioned clause is not applicable for Generator. The generator voltage/frequency range is according bidder's standard proven design. Please also note that generator auxiliary equipment (AC motors) can meet the requested variation in voltage and frequency. Please confirm bidder's understanding is correct.	Please refer generator specification.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
11	2	7.21	All electrical equipment shall be designed for the following ambient conditions (a) Maximum ambient temperature : 50°C	Bidder's understanding that this clause is not applicable for excitation panels. Bidder's Excitation panels are designed for ambient temperature of 40°C maximum which is proven and standard. To meet 50°C of ambient temperature, cabinets have to be assembled inside the room properly ventilated/air conditioned to ensure the proper ambient temperature for the panels operation. Forced air cooled cabinets dissipates approximately 30kW of heat. Please confirm bidder's understanding is correct.	Bid specification prevail
12	Volume-I Section-2A Volume-II/ Section - 11, Corrigendum-1	Cl. 15.1 (ii) Page 244 of 340 Cl. 1.13 Page 121 of 556 Page 8 of 247	all consumables like, grease, lubricating oils, chemicals, ink & graphs for recorders etc. up to satisfactory completion of trial operation. The Contractor shall also arrange any additional quantities required specifically for the Performance Guarantee Test. Supply and application of the final paints and first fill lubricants on all the equipment to be erected under this specification. Supply of LDO, chemicals, lubricating oils upto COD. Supply and application of the final paints and first fill lubricants on all the equipment to be erected under this specification. Supply of LDO, chemicals, lubricating oils/lubricants, consumables etc. upto COD.	Supply and application of the final paints and first fill lubricants on all the equipment to be erected under this specification. Supply of LDO, chemicals, lubricating oils/lubricants, consumables etc. upto reliability test. Please confirm	The clause is deleted.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
13	3	1.2.1	Steam washing system	Normally it is not standard practice to adopt steam washing system for such large turbines. We request that this requirement be reviewed and revised suitably.	Bid specification prevails.
14	3	1.3.8, 1.4.10 Page 32 , 34 of 555	1.3.8 : Independent PLC system (DCS), 1.4.10 : Independent PLC system (DCS),	Would it be acceptable to customer If bidder quotes same hard & software for the controls of CHP/ AHP as being offered for main DCS?	Agreed.
15	3	1.3.16	Hoist	We understand that the 5T hoist referred is for maintenance area in the building. Please confirm.	Specification is self explanatory
16	Volume-II/Section-3	1.4.13 (Page 34)	Supports & Roads / Rail crossing for ash disposal piping including tunnels, culverts etc.	Kindly provide Longitudinal section drawings. Any kind of statutory approval/ permissions and right of way required for ash disposal piping including tunnel, culverts etc. are not in bidder's scope. Please confirm.	For Longitudinal section drawings please refer Addendum II Please refer Volume VI A Section 1 clause 4.4

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
17	3	1.5	Raw water pressure at TP	Please provide the pressure of raw water at terminal point.	Will be provided during detailed engineering.
18	3	1.7.2 and 1.7.3	Fuel oil transfer pumps	Please confirm availability of nozzles in the tank for the fuel oil transfer pump connection.	Confirmed
19	3	1.7.2 and 1.7.3	Fuel oil transfer pumps	Please clarify where is the controls for the transfer pumps. In cl 1.7.5 PLC is referred. Please clarify location of this PLC. Please clarify if feeders for the proposed pumps are available in the existing MCC of 500 MW plant. Interlocks for the proposed pumps will be taken from the existing tank instrumentation, please confirm.	1. Separate Transfer pump house. 2. MCC not available. 3. Level signals will be available from existing tank
20	3	1.7.2 and 1.7.3	Fuel oil transfer pumps	Please provide existing dyke area and pump house layout for reference. Please confirm space availability for the proposed transfer pumps in the area	
21	3	1.7.2 and 1.7.3, 1.7.8	Fuel oil transfer pumps	Please clarify if separate new pump house is required for the proposed transfer pumps in existing fuel oil area.	Yes.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
22	Volume: II Section 3 Section 11	1.7.15 86	Electric Heat tracing	Per Volume III-A, steam heat tracing is specified in mechanical specification and electrical heat tracing panel is mentioned in Volume II. Please confirm that steam heat tracing for HFO is acceptable.	Vol IIIA prevails.
23	3	1.7.18	Fuel oil pump house	Generally cable spreader room is not applicable for these MCC rooms. This is because the number of feeders is very less for this area. Please review.	Bid specification prevail
24	3	1.8	Compressed air system	For mill reject system only conveying air compressors will be provided. Service air and instrument air system will be fed from the station compressed air system. Similarly for ash handling plant, service air requirement if any will be met from station air. Only conveying air compressor and instrument air compressor will be provided. Please confirm. For CHP area, separate instrument air compressors are not provided. Please review.	Bid specification prevail
25	Vol -II Sect-3 Page 41 of 555	1.8.1	Non- oil lubricated screw compressors.	we propose to consider oil injected screw compressor / Non- oil lubricated reciprocating compressor. Pl.confirm.	Bid specification prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
26	3	1.11.6	Transformers	Please clarify if nitrogen blanketing system is required in addition to the spray system.	Nitrogen Injection based Fire Protection system shall be provided to Generator transformer, Station transformer and Unit Aux. Transformer, in addition to HVW Spray system.
27	3	1.11.6	Transformers	If nitrogen blanketing system is required, please confirm that it is for generator transformers only.	Nitrogen Injection based Fire Protection system shall be provided to Generator transformer, Station transformer and Unit Aux. Transformer, in addition to HVW Spray system.
28	3	1.15.2	All major transformers e.g. Generator & Station transformers, Unit Transformers, Unit Auxiliary Transformers & Station Auxiliary Transformers.	Station Transformers may not be applicable in case of GCB Scheme offered by Bidder.	Bid specification prevail
29	3	1.15.5	AC lighting & distribution boards, 220V DC distribution boards & fuse boards etc, ABT panels, control & protection panels, Synchronizing panels,	ABT type tariff metering panel is not envisaged in Bidder's scope as Switchyard is excluded. Instead Energy Accounting & Audit Meter may be Included as per Clause 3 of CEA Regulation No. 502/6/2009/DP&D/D-I dated 4th June 2010.	ABT means Auto bus Transfer

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
30	Sec-3	1.15.5	... Variable Frequency drives (if applicable) for ID fans,---ABT panels & Synchronizing panels etc. for complete plant	VFD is not applicable for ID Fan. No separate Synchronising Panel be provided. Synchronising will be part of swgr. Or ECP as per requirement. If 'ABT' means Auto Bus Transfer Panel, then it will be provided . If 'ABT' means 'Avialability Based tariff Panel' Then it should be part of Switchyard package. Pl.confirm	ABT means auto bus Transfer
31	3	1.15.6	Generator isolated phase bus ducts, HT phase segregated bus ducts (for 11kV & 3.3 kV switchgears) & LT non phase segregated bus ducts.	If Layout does not allow, Bidder may be allowed to use Cables for connections between Switchgears and Transformers.	Bid specification prevail
32	3	1.15.14, 1.15.15	Local control panels, Local push button stations and Energy saving system panel.	Bidder requests Client to clarify "Energy Saving System Panel" and scope for the same.	Refer volume IV.Sec-7.Clause No.6.21
33	Sec-3	1.15.14 & 1.15.15	 Energy Saving system panels	The scope and description are not Clear. Pl. clarify	Refer volume IV.Sec-7.Clause No.6.21
34	3	1.15.20m	Workshop	Please clarify if workshop equipment and building are included in EPC scope.	Yes, Included; list will be sent.

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
35	3	1.15.20 (m)	Workshop Equipment	Please furnish the list of workshop equipments.	Being furnished
36	Sec-3	1.15.20 (n)	 VFD equipment Building	AS VFD for ID fans are Not applicable, VFD equipment Building is not applicable.Pl.confirm	If radial fan is used, then VFD building is applicable.
37	3	1.15.20-ff	All the plants, areas, buildings etc. shown on plot plan & other drawings.	Bidder requests Client to amend this clause by excluding Electrical Work for Colony as the same is excluded in Main Scope of Work in Volume-II, Section-3, Clause No.-3.	If colony civil work excluded then colony electrical work also excluded.
38	3	1.15.21	However load flow & transient stability study which may be done on approved software.	Bidder wishes to clarify that load flow & transient stability is done on ETAP as per currently accepted Industry Practice. Bidder requests client to allow ETAP for all Electrical Studies.	Refer Corrigendum-II Master specification Volume - II
39	Sec-3	1.15.21 (a)	All the electrical system studies such as short circuit levels, voltage drops, grounding, relay setting, relay co-ordination etc & all sizing calculations such as transformers, busducts, switchgears, motors, cables, lighting, DC UPS system etc. manual calculations & E-Tap software	Following may please be noted with electrical system studies and sizing calculation viz software calculation and manual calculation: a. For Short Circuit levels, Voltage drops, Grounding, Relay setting, Relay co-ordination, Load flow and transient stability study will be done by E-Tap software. No manual calculation will provided for above studies. b. For Sizing calculation for transformer, busduct, cables, lighting, DC Battery & Charger only Manual calculation will be provided. Pl.confirm	Refer Corrigendum-II Master specification Volume - II

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
40	Volume II / Section-3	1.15.21 (a) Page- 49 of 555	All the electrical system studies such as short circuit levels, voltage drops, grounding, relay setting & relay co-ordination etc. & all sizing calculations such as transformers, bus ducts, switchgears, motors, cables, lighting, DC & UPS system etc. by manual calculations & ETAP software & their approvals & then AS BUILT. However load flow & transient stability study which may be done on approved software.	All design calculation/sizing calculation shall be carried out by approved software. We have not envisaged manual calculation at this stage however sample manual calculation can be submitted for review based on mutual agreement. Please confirm acceptance.	Refer Corrigendum-II Master specification Volume - II
41	3	1.15.21 (a)	...However load flow & transient stability study may be done on approved software.	Bidder's understanding is that the load flow and transient stability study done on ETAP is acceptable. Please confirm.	Refer Corrigendum-II Master specification Volume - II
42	Volume II / Section-3	1.16.12	Optical fiber interface between DCS and PLC /microprocessor based control in Off-site plants & Plant auxiliary area.	Connectivity between standalone PLC systems for Soot Blower with Station DCS shall be through OPC on standard twisted pair Ethernet cable.	Agreed.
43	3	1.16.26	Process plant simulator	Please clarify this requirement. Please let us know if separate simulator is to be supplied under this contract.	Separate simulator to be provided
44	3	1.16.30	All local panels, supervisory control panels / consoles.	Bidder requests client to Exclude any Back-Up Panel, Supervisory control Panelss other than Excitation System, Generator Protection, Unit Synchronisation and Bay Control Unit for Generator Bay. All Controls, Display, Mimic, Alarm & Annunciation will be built in DCS Workstations and Large Video Screen Display.	Bid specification prevails

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
45	3	1.16.38	24V DC battery & battery charger	It shall not be mandatory to feed Bidder's control system through 24VDC voltage level. As per cl. no. 4.2, page 22 of 718, section-1 of Volume:V of specification to use 2x100% parallel redundant UPS with 2 nos. of battery for 60 minute backup is envisaged for various C&I System which will be also used to feed DCS 240 VAC. Any other voltage level like 24VDC shall be derived inside the control system from AC supply.	Bid specification prevails
46	3	1.17.1	Railway siding	We request that the work towards railway siding be carried out by Mahagenco through RITES or other similar agencies as is normally adopted for other projects. These work require approvals from Railways which can be obtained by Owner directly.	Bid specification prevail
47	3	1.17.2	Spring foundations	The provision of springs for TG foundations depends on TG manufacturer practice. Please let us know if Mahagenco can accept foundations without springs for TG if the same is as per manufacturer practice.	Please refer Volume VI A section 2 Annexure I clause 7.0 (special attention)

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
48	3	1.17.5	Contour drg	Please provide ACAD or other similar data for site contour levels, if available.	Adequate information in readable format had been provided to bidders.
49			Soil investigation report	Please provide us the soil investigation report and/or borelog data, if available for the proposed site carried out by Mahagenco for reference.	Already furnished.
50	3	1.17.8.1	CW system	We understand that from the cooling tower outlet to the forebay channel can also be adopted.	Refer Volume VI A section 1 clause 4.11
51	Volume II Section-3	1.17.8.3	Mill reject system compressor house.	We may consider Mill reject handling system conveying Compressor in the AHP Compressor house. Hence, separate compressor house for MRHS system may not be required. Please confirm.	Bid Specification prevails
52	3	1.17.8.11	Ash pipes	This clause refers to existing ash disposal pipelines. Please clarify the scope to be carried out by the Bidder with respect to the existing ash pipe lines.	Please refer Addendum II to Bid specification & Volume VI A section 1 clause 4.4
53	3	1.22	One set of tools and tackles, fixtures etc. in new condition as required for regular operation and maintenance of the plant and the equipment offered.	Bidder wishes to propose that new tools and tackles shall be used for erection and commissioning of the plant and the same shall be handed over to the Client Kindly confirm.	Bid Specification prevails.

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
54	3	1.22	Tools	Certain special tools and tackles are supplied with the equipment and are used for erection and also maintenance. Such tools will be supplied in one set. After they are used for erection, they will be made to good condition and handed over to Owner.	Separate tools for maintenance & lab purpose to be provided
55	Volume-I/Section 3 Volume-III B/Section 6	Clause No. 2.4.4, Page no. 316 Clause No. 3.13, Page no. 207 of 313	Subcontractor should have designed & supplied at least on CP of MB type.... Each of these vessels shall have a min. cap. Of 500 cu.m/hr. ... The above plant should be in successful operation for period of at least one year Vendor should offer proven technology, which has successful operation track record for min. 2years in supercritical plant.	In view of the fact that no supercritical plant in India has been in operation for 2 years till now and to consider Indian suppliers also, Therefore Clause No. 2.4.4, Page no. 316 shall be considered and cl. no. 3.13 shall not be applicable. Please review and confirm.	Clause deleted. Vol I Prevails.
56	3	3.1	Power evacuation and transmission system beyond generator transformer and station transformer HV bushing. Necessary coordination with transmission package supplier shall be responsibility of the bidder under this contract.	As per Cl. 2.1.1, sectio-1, Vol. IV-A, page 19 of 440, "Connection from bus post insulator (BPI) to LA and then LA to bushing of generator transformer and station transformer's bushing shall be arranged by power plant EPC contractor." As per Bidder's understanding, terminal point is at the HV bushing of the Generator Transformer and station transformer. Please clarify	Bid Specification shall prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
57	3	4	Drains terminal point	Please inform the terminal point for the plant drains.	There will be 2 nos. of disposal points for storm water drains. The locations of the same is at bridge no. 17 & 18 of railway siding for 2 X 500 MW unit.
58	3	4	Terminal point for effluent water	Please indicate the terminal point for treated sewage water from the STP and also the water after ETP.	Treated sewage water is to be used for gardening and terminal points of the pipes shall be upto the farthest point of green belt within periphery of the plot. ETP water shall be taken to ash water sump of bottom ash handling system

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
59	3	4.6	TP for Fuel Oil, Auxiliary steam and raw water: Isolation valve on tapping shall be supplied by bidder.	1. Existing plants from where tapping are to taken are under commissioning as per Bid Specifications and hence Bidder proposes customer to supply isolation valve for all the terminal points where integration with existing system is required. 2. Terminal point for connecting return oil (from pump outlet) to tank shall be provided by customer (Not Specified in tender) 3. Indicative co-ordinates of the Terminal points on the plot plan for Fuel oil, aux steam and raw water etc and all other utilities which are connected with the existing system, to be speccified. pl. also refer to clauae 4.7 and 4.8	1. Bid Specification prevails. 2.Fuel oil : Please refer Fuel oil system P& ID. 3.Exact physical location shall be collected from site.
60	3	4.6	As per Terminal point list, tapping from header of outlet pipe from tank shall be in scope. Where as, as per P&I diagram, we have to terminal point is at tank nozzle connection.	Please provide piping arrangement drawing indicating provisions (TPs) of Fuel Oil pipe extension from existing plant tanks to 1 x 660 MW expansion.	The terminal point is tank outlet nozzle; adequate data has been provided in the specification; additional details bidder to get from site
61	3	4.7	Terminal Point for Auxiliary steam	Please specify the Pressure and Temperature of the Auxiliary Steam Available at terminal Point.pl. also refer to clauae 4.6 and 4.8	14 ata,310 deg C.

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
62	3	4.7	Aux steam	a) Please inform the pressure and temp of steam (operating and design) for the aux steam header. b) It is understood that the existing aux steam header already has tapoff made and blanked for use in the proposed unit. c) Please let us have the arrgt drg showing location of the aux steam header. d) Please inform the capacity (tph) of steam which can be sourced from the existing steam header. e) Please confirm that existing structures /pipe rack in existing plant can be used to support the aux steam piping taken to the proposed plant.	14 ata,310 deg C ; spare capacity is 70 TPH. Rest of the data will be provided during detailed engineering.
63	Volume - II/Section- 3 & Volume- VIIA2	4.7 & Process Flow Diagram: Auxiliary Steam System (PE189-PF-205, Rev P1)	Auxiliary Steam	Owner to kindly indicate the flow, pressure and temperature available at terminal point for Aux. steam system from existing plant. It may be noted that a pressure of 17 kg/cm2(a), temperature of 350 Deg C will be required at user end. Expected flow is 120 TPH considering SCAPH operation during start-up. Please therefore clarify whether we should consider auxiliary boiler separately in our scope. We intend to use existing pipe rack/sleepers for Aux steam header routing till plant boundary. Please confirm.	14 ata,310 deg C ; spare capacity is 70 TPH. Rest of the data will be provided during detailed engineering.

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
64	3	4.8	RW system	Please provide drawing showing location/arrgt of the raw water tapping point.	Tentative location of tapping point for Raw water is shown in the Bid plot plan drawing. However detail arrangement is to be decided by successful bidder.
65	Volume-II/Section-3	4.8 (Page 58)	Tapping from gravity water line for 2x 500 MW units.	Please provide the coordinates for tapping of water from the water pipe line laid/ proposed for 2x500 MW unit.	The scheme is being revised and will be sent to bidders.
66	3	4.8	RAW WATER: Tapping from gravity water line for 2x500MW units. Isolation valve on tapping and complete system downstream of this tapping shall be by bidder.	Please clarify the terminal point co-ordinates including Elevation and also please confirm the Pressure available at Terminal point.	The scheme is being revised and will be sent to bidders.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
67	3	4.11	Power supply for transfer pumps	Please clarify terminal point for power supply to the proposed fuel transfer pumps located in the existing fuel oil area.	Refer Plot plan for location & supply shown in Key SLD drawing.
68	3	4.11.2	Supply, Civil foundation, intermediate gantry foundation, supply, installation and connection of LA & bus post insulators including connectors on EHV side are in EPC contractor scope	1. Only LA & Bus Post Insulators in the immediate vicinity of Generator Transformer & Station Transformer and their Connectors are in EPC Contractor's scope. Please confirm that Bidder's understanding is correct. 2. HV Switchyard is excluded from Bidder's scope. LA, BPI & Tube Bus constitute very little scope related to HV Switchyard for which the Design & Engineering like Layout Plan & Elevation , Insulation Co-ordination, Equipment Selection and Supply etc. are already being done by Switchyard Contractor. In view of the above Bidder requests to exclude this from EPC Contractor's scope.	Bid specification prevail
69	Sec-3	4.11.2 & 4.11.3	Bus post Insulator(BPI) and HV terminal connector for GT and ST	It is requested to exclude BPI and HV terminal connector out of scope of this bid. It may be included as a part of Switchyard scope. Also Insulator for overhead conductors at A-row will in switchyard scope. Pl.confirm	Bid specification prevail
70	3	4.11.4	Inter connection of power plant earthing grids with switchyard package, earthing grids at minimum four points, also interconnection with existing earth grid 2 X 500MW units at minimum 4 points are in EPC contractor scope.	Bidder requests Customer to indicate the Co-Ordinates of the InterConnection Points of Earth Grid in Plot Plan for Bidder's Estimation.	Refer corrigendum-II Master Specification Volume - II.

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
71	Sec-3	4.11.4	 Interconnection with existing earth grid of 2x500MW units at min. 4 points are in EPC contractor scope.	Point of interconnection not clear as roads and other structure is coming between existing and proposed unit. Pl. specify point of inter-connection.Pl.confirm	Bid specification prevail
72	3	4.11.6	Switchyard interface	We understand switchyard controls is also provided by transmission package vendor. Please confirm. So individual switchyard equipment is not interfaced with the control room. Please provide the expected interface between the switchyard control and the plant control room.	Corrigendum-II, annexure D, Table-1, Vol-IV A.
73	Volume II / Section-3	4.11.7 Page- 60 of 555	All interconnections & interfacing between various plants is in EPC contractor's scope.	We have envisaged below ground earth grid connection of proposed plant with 500 MW earth grid at four (4) points at plant boundary.	Specification is self-explanatory
74	3	5	Land: Land free of charges as available for the Construction of (a) Residential accommodation to be built by contractor at his own expense for his employees near site. (b) Site office, pre-assembly/ storage yard to be constructed by contractor at his own expense within plant site.	The Clause no. 4.1/4.4 of Vol-I, Sec. 2B & Clause no. 5 of Vol-II, Sec. 5 are Contradictory. Customer to organise the land for site office/ temporary structures & Lay down areas in side the plant boundaries and land for staff & labour colony at free of cost.	Volume I section 2B clause no. 4.1.1 shall prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
75	Volume-II/Section-3	5.1 (Page 60)	Land, free of charges as available for the construction of: (a) Residential accommodation to be built by the contractor at his own expense for his employees near the site.	We understand that the land for the construction of labour colony inside the plant shall be provided free of charges by the Owner. Please confirm.	Volume I section 2B clause no. 4.1.1 shall prevail
76	Volume II / Section-3	5.2 Page- 60 of 555	Construction power at 11 kV AC $\pm 10\%$, 3 Phase, 50 Hz $\pm 5\%$ and Construction water shall be made available at one point near the erection site by the Owner. Regarding charges, please refer Volume-I of this specification.	Bidder requests Owner to provide construction power of capacity 3 MVA approximate, at 11kV level at one location within plant boundary. Further downstream distribution of construction power shall be in Bidder scope of work.	Volume I section 2B clause no. 4.2 and 4.3 shall prevail
77	3	-	Scope of supply	Bidder's understanding is that Hydrogen Generation Plant is out of Bidder's scope of supply. Please Confirm	Confirmed
78	4	1.2	Codes and standards	Please review the requirement to include complete code or standard in English for any equivalent materials along with the tender. An extract can be provided in such case.	Bid specification prevails
79	4	1.6	Successful Bidder shall furnish two (2) sets of latest of national/international codes and standards to owner.	Bidder clarifies that furnishing national / international standards shall not be bidder's responsibility. It is difficult to quantify the required and relevant national / international codes and standards. It call for lot of extra work and cost implications. Laos, it is not allowed by the International standards committee to take & distribute the copies of the standards. Kindly accept.	Bid Specification prevails.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
80	4	1.6	Codes and standards	This requirement to provide copies of codes and standards is practically difficult due to following reasons: a) Copy right requirements. B) The specification does not indicate which type of standards should be furnished. For example there could be many minor standards referred in QAP or factory procedures for components. This extends to major and minor components. It is practically not possible to provide 2 sets of codes and standards for all such codes and standards. In many cases such reference to code/standard is made to only a insignificant portion of the code/standard itself. We request you to delete this requirement.	Bid Specification shall prevail
81	4	1.6	Successful bidder shall furnish two (2) sets of latest of national/ international codes and standards to the Owner	Bidder's understanding is that wherever codes and standards used are different from the specification requirement, in those cases only the codes and standards needs to be provided. Please clarify.	Bid Specification shall prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
82	4	2.2	Notwithstanding the Owner's wish to receive the benefits of new, advanced and improved technologies, a prime requirement is that all the systems and components proposed shall have been already adequately developed and shall have demonstrated good reliability under similar or more arduous conditions elsewhere, at least for continuous two (2) years in two different power stations.	client to note that as clause no. 2.2.3, Section - 3, Volume 1 it is mentioned that the for the respective equipments mentioned under that clause, the equipment of desired capacity (as defined under the clause) should have been succesful operation an at least One (1) plant for a period of not less than one (1) year from the date of opening of bid. However as per the caluse 2.2 of volume 2, it is mentioned that all the systems and components shall be been in service for at least 2 years in two different power stations. Bidder understands that the criteria as defined in clause 2.2.3 of volume - 1 shall remain applicable. Kindly ammend the clause of volume 2.	Vol I shall prevail
83	Volume II/ Section- 4	2.4.3 Page- 97 of 555	Pipe/Cable trench - Not applicable	Cable trenches in transformer yard in line with Vol IV-A, Section-1, Cl. 1.8.1.e shall be allowed	Provisions of Vol IV A Section 1 Cl 1.8.1 is applicable for transformer yard only.
84	Volume-II/Section- 4	5.1.1 (Page 103)	False flooring and ceiling	False ceiling may be provided only in the Central control room, Offices, training rooms. Other areas like switchgear rooms, MCC rooms etc. false ceiling will not be considered. Please confirm.	False ceiling shall be provided as per Volume VI A section 4 clause no. 4.1c & clause no. 6
85	Volume II/ Section- 4	Annexure-C 5.1.7 Page- 104 of 555	The Control Room lighting shall be designed to provide a glare free uniform illumination. The level of illumination shall be minimum 400 LUX.	We are considering 300Lux in line with Vol IV-B, Section 7, Cl. 5.4.4.1.e	Refer Corrigendum-II, vol.II.

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
86	4	6.1.4	Floor slabs	The requirement for space between floor slabs is not applicable for cable vault/cellar, MCC rooms, office areas. Please confirm.	For cable vault, the clear distance will be 3.5 m . For the rest, Bid specification shall prevail
87	Volume-II/Section-4	6.1.4 (Page 69)	The minimum clear height available between two consecutive floor slabs shall not be less than five (5) meters.	The clear gap between two consecutive floor slabs shall be based on functional requirement and minimum 3.5m shall be provided.	For cable vault, the clear distance will be 3.5 m . For the rest, Bid specification shall prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
88	4	6.1.5	Multistorey bldg - Staircase	The number of staircase for multistorey building depends on the floor area. For smaller buildings, example single storey cable cellar+MCC room or control room, single staircase is adequate. In general the provision of number of staircase would follow TAC and relevant Indian building codes. Please review and confirm	Bid specification prevails
89	Vol II - Section 4	6.1.9	Cable racks / pipe racks shall have hand railings in walkways on both sides 'at appropriate heights.	We propose to provide single walkway with handrails on each tier.	Pipe / cable rack shall have single walk ways @centre of each tier.
90	Vol II - Section 4	6.1.9	Concept of various mechanical and electrical equipment location and building dimensions (including column-row spacing) as shown in Plot Plan/Floor Plan drawing are to be adhered as far as possible. Any departure from this suggestive layout is primarily not recommended.	Layouts and floor plans are machine specific and therefore, as per our standard practice/machine design, the TG building and Boiler layout will be different than what has been provided in the specification. For example, front mill configuration layout is completely different than what has been shown in your lay out which is on the basis of side mill orientation. Hence, if the layout meets the specific criterion of operation and maintenance space/requirements, same shall be accepted.	Bid Specification shall prevail
91	4	6.1.10	Concept of various mechanical and electrical equipment location and building dimensions (including column-row spacing) as shown in Plot Plan/Floor Plan drawing are to be adhered as far as possible. Any departure from this suggestive layout is primarily not recommended.	Statement is not clear. Owner to clarify if changes in building size, column-row spacing with respect to tender specs in view of techno-economic optimization is permitted.	Specification is self-explanatory

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
92	4	6.2.2	Mill and bunker building	We understand that being EPC contract, the Bidder is allowed to provide the dimensions of the mill building (width and length) different from those specified meeting the equipment requirements and complying with the layout guidelines of the specification. Please confirm.	Bid specification prevail
93	Vol II - Section 4	6.2.2	Mills shall be located by the side of Boiler. The width of Mill/Bunker building shall be 12.5 M and the length of the same shall be 10.5 M per Mill. A clear walkway of 1200 mm (min) shall be ensured between the mills/ its foundation/ mill reject vessel edge and inner face of mill bay column. Raw coal bunker shall be circular in shape unless otherwise approved.	As explained above, as per our standard practice, the Boiler is with Front mill/bunker arrangement in D - E bay and hence, layout shall be done accordingly. The advantage in this layout is obvious and would reduce capital cost substantially.	Bid specification prevail
94	4	6.2.9	Walkway	We request you to revise the dimension to 400 mm from column face instead of 600 mm as it is difficult to achieve at the column locations.	Bid specification prevail
95	4	12.0	Sec - 4 Cold start-up Warm Start-up Hot Start-up	Sec - 8 > 50 Hrs > 36 Hrs 10 - 50 Hrs 8 - 36 Hrs < 10 Hrs < 8 Hrs	Client to note that there is a difference between the definitions of various start-up conditons as per section - 4 of the technical specification and as per section - 8 of the technical specification. Kindly resolve the discrepancy. Also refer to section 8 and clause 1.4.17 (a)
					Clause No. 12.0 section -4 prevails.

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
96	4	12.0	PLANT LIFE AND MODE OF OPERATION (a) Cold start-up (>50hrs. shutdown): 20 per year (b) Warm start-up (between 10 to 50 hrs. of shutdown): 140 per year (c) Hot start-up (Less than 10 hrs. shutdown): 180 per year	"(a) Cold start-up (>36 50 hrs. shutdown): 20 per year (b) Warm start-up (between 8 10 to 36 50 hrs. of shutdown): 140 per year (c) Hot start-up (Less than 8 10 hrs. shutdown): 180 per year" Reason: We understand start-up mode are described above according to Vol.II Section-8 clause 1.4.17 (GUARANTEES UNDER CATEGORY-III). Please confirm.	Clause No. 12.0 section -4 prevails.
97	Volume-II/ Section-4	12	The complete plant including all the equipment and systems individually and collectively shall be designed for continuous operation for an economic service life of thirty (30) years under the prevailing site conditions and for the type of duty intended. The allowable stresses shall be so selected so that life expectancy to minimum 2,00,000 hours of operation can be achieved.	Pressure parts material will be selected as per ASME using ASME published stress values which is considering 1,00,000 hrs creep life. With this approach, Bidder confirms that boiler will give expected life span of 30 years.	Bid Specification prevails.

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
98	1 1 1 3 3	Volume-II/ Section-4/12 Volume-IIIB/ 5.6 Volume-IIIB/ Datasheet A 1.6 C Volume-IIIB/ 3.1 Volume-IIIB/ 3.1.23 Volume-IIIB/ 3.4	The unit would be operated on base load with cyclic load variation. The load variation is expected to be as per schedule depending on power demand. The units shall also be suitable for two shift operation, if required Turbine shall be suitable for two cycle shift operation. Two shift operation and cyclic load variation. The steam turbine generator unit will normally operate as base load unit and in parallel with grid. The steam turbine generator unit will normally operate as base load unit and in parallel with grid. The plant is designed for base load service.	We understand that the unit will be base loaded and would be operated as per the number of starts mentioned in Vol II Section-4, Cl. No. 12.0, Page 76 of 555. Hence, we do not foresee the plant being operated in a two shift operation.	Confirmed
99	4	15	All paintings shall be used in accordance with the manufacturer's instructions. No thinners or other substances shall be added to the coating material without the approval of the engineer. The quality and vendor of the paints shall require approval of the owner.	Bidder has its own proven practices of painting & ensuring its quality which is based on the manufacturer's feedback and best engineering practices. We request you to remove approval of owner / engineer as mentioned.	Bid Specification prevails.

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
100	4	15.4	The contractor shall select the type and colour of primer & finish coat after approval by the owner.	Bidder has its own proven practices of painting & ensuring its quality which is based on the manufacturer's feedback and best engineering practices. We request you to remove approval of owner / engineer as mentioned.	Bid Specification prevails.
101	Volume-II/Section-4	Corrigendum-1 6.1.6 (Page 70) 6.00 (Page 104)	Toilets and drinking water facility	As per standard power plant practices, toilets are not provided for unmanned buildings like e.g. DG building, Compressor building, Transfer points of CHP, etc. Please confirm.	Bid Specification prevails.
102	4	17.1	MoEF requirements	If there are any conditions for the project provided by MoEF, same shall be informed along with the specification. If any new conditions arise after the contract award which call for changes to the agreed contract specifications, same shall be subject to mutual agreement between Owner and contractor.	Bid specification prevail

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
103	Vol II - Section 4	17.1 17.2.3	In case the Ministry of Environment & Forest stipulates any other conditions not specified hereunder while clearing the project, same shall be complied with by the Contractor. Any statutory changes in stipulations regarding noise limitation that may occur in future according to Maharashtra Pollution Control Board or Central Pollution Control Board or Ministry of Environment & Forest regulation during tenure of the contract, the Contractor shall comply with the requirement.	This shall be complied if it is technically feasible and with price implications. However, if any changes happen, this shall be mutually discussed and finalized.	Bid Specification shall prevail
104	4	17.1.1b	PCB requirements	If there any specific requirements of State Pollution Authorities please inform the same with the specification.	Bid specification prevail
105	4	17.1.2c	SO2	Please review requirement for World Bank Standards for SO2. We request that this requirement be deleted.	MOEF guideline to be follow for SO2

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Pre - Bid Queries					
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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
106	4	17.2.1	Maximum noise level shall not exceed 85 dB (A) when measured at 1.0 M away from the noise emission source.	We understand that the specified requirement refers to the maximum surface sound pressure level emitted by the equipment at a distance of 1m, and at a height of 1.5m above normally accessible walkways and platforms. As per definition of ISO 3746, the surface sound pressure level of an equipment / installation at a distance of 1m corresponds to the average noise level emitted by this equipment in free field conditions, on a measurement surface which envelops the equipment at a distance of 1m. According to this standard, the in-situ measured noise levels must be therefore corrected for both influences of the background noise and sound reflections (especially inside buildings), in order to determine the surface sound pressure level of the equipment. Please confirm our understanding is correct. Noise measurements will be carried out during the continuous operation of the Plant at base load, which corresponds to the most significant operating conditions in terms of noise emissions.	Shall not exceed 85 dB(A) 1.0 m equipment outline.
107	Volume II Section 4	17.2.1	Maximum noise level shall not exceed 85 dB (A) when measured at 1.0 meter away from the noise emission source.	Noise level may exceed 85 dB(A) at 1.0 m distance during transient/abnormal conditions.	Shall not exceed 85 dB(A) 1.0 m equipment outline.

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
108	4	17.2.2	Maximum noise level from its source within the premises shall not exceed 70 dB (A) as per Environment (Protection) Rules 1986, Schedule-III, 'Ambient Air Quality Standards' in respect of noise.	We understand that the overall noise level emitted by the Plant equipment during normal continuous operation, excluding the ambient background noise level caused by other external sources, shall not exceed 70 dB(A) at the Site property line in accordance with MoEF and CPCB rules. Please confirm.	Shall not exceed 85 dB(A) 1.0 m equipment outline.
109	4	17.2.3	Any statutory changes in stipulations regarding noise limitation that may occur in future according to Maharashtra Pollution Control Board or Central Pollution Control Board or Ministry of Environment & Forest regulation during tenure of the contract, the Contractor shall comply with the requirement. An exception will be made for the plant at startup operations and other big pressure reducing devices operating during emergency periods and for the safety valves.	For the design of the Plant, ALSTOM can consider the statutory requirements regarding noise limitation, which are in force at the signing of the Contract and will be binding..	Bid specification prevail
110	4	17.2.3	Statutory changes	If there any statutory changes resulting in modifications to the specifications after the contract award, implementation of the same shall be subject to mutual agreement between Owner and contractor. It is not practically possible to predict and assume compliance to future statutory changes.	Bid Specification shall prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**Pre - Bid Queries****Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
111	4	18.1.1	The comprehensive list of tests considered for each of the equipment/ systems shall be furnished as part of the bid.	Tests shall be conducted as per bidder's standard and proven practice. Bidder ensuring quality by giving reference of same model running world wide. Please confirm acceptance of bidder's standard and proven practice.	Bid Specification shall prevail
112	4	18.1.1	An indicative list of inspection and testing requirements for each package has been given for equipments across various volumes of this specification. Bidder shall note that these testing and inspections listed herein are the minimum requirements as perceived by the owner; the bidder shall consider this only as a general guidance and is not meant to be exhaustive. The bidder shall consider requisite testing and inspections across the equipments/systems forming the proposed power plant unit based on his own experience and in line with the current industry practices for identically rated power plant for the technology under consideration. The comprehensive list of tests considered for each of the equipment/system shall be furnished as part of the bid.	Standard ITP/QAP for major/critical items only shall be submitted as part of the bid.	Bid Specification shall prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**Pre - Bid Queries****Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
113	4	18.2.3	Before any item of plant or equipment leaves its place of manufacture, the Owner shall be given the option of witnessing inspections and tests for compliance with the specification and related standards. Advance notice shall be given to the Owner as agreed in the Contract, prior to the stage of manufacture being reached, and the piece of plant must be held at this stage until the Owner has inspected the piece, or has advised in writing that inspection is waived. If having consulted the Owner and given reasonable notice in writing of the date on which the piece of plant will be available for inspection, the Owner does not attend the Contractor may proceed with manufacture having forwarded to the Owner duly certified copies of his own inspection and test results.	As per bidder's standard practice, witness points agreed with the customer are entered in the final negotiated versions of the I & T Program. The customer or his acceptance authority will be informed of the readiness for such witnessing within the period agreed upon. If in case of inspections defined as witness points, the witnessing party is unable to participate on the announced date, the inspection will be performed by an internal inspection unit, independent of manufacturing, and the work will be continued. In case of acceptance tests by official authorities, the work will be stopped until the witnessing party is able to attend. In case of inspections defined as customer hold points, the work will be stopped until the witnessing party is able to attend or witnessing is officially waived. Delays resulting from failure to respond to the notification will not be the responsibility of bidder's. In addition, the I & T Program contain information with regard to the type of quality records: for internal purpose only or quality record handed over to the customer as part of the final documentation, on completion of the contract supply. Please confirm acceptance of bidder's standard and proven practice.	Bid Specification shall prevail

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
114	4	18.2.4	The contractor shall forthwith forward to the engineer duly certified six(6) copies of the Test Certificates.Distribution of six(6) copies of test certificates for approval will be two(2) copies to owner and four(4) copies to consultant.These four(4) copies will be further distributed by consultant after approval to owner,site and bidder.one copy will be retained with the consultant for record purpose. Further ,nine(9) copies of shop test certificates shall be bound with instruction manuals referred to elsewhere.Distribution of nine(9) copies of shop test certificates for approval will be Two(2) copies to owner,Three(3) copies to site,Two(2) copies to consultant,Two(2) copies to owner's library /record.	The documentation requirement are specified in varying nature,may be considered with submission of one set in soft form and two sets in hard form.	Bid Specification shall prevail
115	4	18.2.5	Under no circumstances any repair or welding of castings shall be carried out without the consent of the engineer. Proof of the effectiveness of each repair by radiographic and/or other non-destructive testing technique, shall be provided to the engineer.	Bidder follows the proven Inspection & Test programmes for weld repair of the castings. Proof of the effectiveness of each major repair by non-destructive testing technique, shall be provided to the engineer.	Bid Specification shall prevail

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
116	4	18.2.6	All the individual and assembled rotating parts shall be statically and dynamically balanced in the works. Where accurate alignment is necessary for component parts of machinery normally assembled on site, the Contractor shall allow for trial assembly prior to despatch from place of manufacture.	All rotors are completely assembled and balanced at 20% overspeed prior to shipment. Please confirm acceptance of bidder's proven practice.	Bid Specification is self-explanatory.
117	4	18.2.7	All materials used for the manufacture of equipment covered under this specification shall be of tested quality.	Please clarify the intent of specification. Whether material as per code specification is acceptable.	Bid Specification shall prevail
118	4	18.2.8	All pressure parts connected to pumping main shall be subjected to hydraulic testing at a pressure of 150% of shut-off head for a period not less than one hour. Other parts shall be tested for one and half times the maximum operating pressure, for a period not less than one hour.	client to note that as per ASME B 31.1 the requirement of hydrotesting of the piping shall be 1.5 x design pressure. The pressure shall be continuously maintained for a minimum time of 10 min and may then be reduced to design pressure and then held for such time as may be necessary to examine leakages. Bidder requests Client to kindly amend the hydrotesting requirement inline with the code requirement.	Bid Specification shall prevail
119	4	18.2.8	All pressure parts connected to pumping main shall be subjected to hydraulic testing at a pressure of 150% of shut-off head for a period not less than one hour. Other parts shall be tested for one and half times the maximum operating pressure, for a period not less than one hour	Please clarify if the testing in accordance with codes / standards are acceptable.	Bid Specification shall prevail

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
120	Volume II/ Section-4	19	The Contractor shall extend all possible assistance and co-operation to the Owner regarding the transfer of technology and developing expertise in the area of engineering operation and maintenance of the Plant.	The bidder shall extend possible assistance and co-operation to owner for supercritical Boiler / Turbine for operation and maintenance of the Plant. However the technology (supercritical Boiler / Turbine technology) is proprietary in nature shall not be transferred to owner.	Bid Specification prevail ; Reg Technology transfer, CI No. 45, Section 2 Volume 1 shall prevail.
121	4	ANNEXURE-A	List of standards for reference	Bidder requests client to include EN (European Standards) in the list.	Agreed.
122	4	Ann-A	List of codes/standards	The following codes/standards may also be added: a) EN b) AWWA c) VDI/VDE d) GB or eqvt	EN, AWWA and VDI/VDE are acceptable.
123	Vol II - Section 4	/ Annexure-A	List of Standards for reference	AWWA should be included	Agreed
124	4	Annexure-C, 3.0	OTHER MAINTENANCE REQUIREMENT In case the Generator stator cannot be handled by the turbine house crane, all provisions for its overhauling, including the arrangement to slide the stator on the turbine house floor, the foundation work for stator jacking / lowering assembly, dismantling of building end walls / structures etc. shall be kept.	We would like to clarify that if Strand Jack Arrangement is opted for lifting of generator stator, provision of strand jack for stator lifting shall be provided only during erection and no such provision for generator stator handling shall be provided during normal maintenance of the generator stator.	Agreed.

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
125	4	Sl. No. 5.1.3(Annexure C)	Control room	The portion of floor area for control consoles/panels in the control room (indicated as 15% now) appears very low. Please review. This could be around 25-30% of floor area.	Bid Specification prevails
126	4	ANNEXURE-D	While developing the layouts, the following major layout parameters shall be ensured, as a minimum:	Being EPC Bid, Bidder shall be given flexibility to optimise layout at Bidding stage, Please confirm.	Bid Specification shall prevail
127	4	ANNEXURE-D	Floor levels in AB bay-- 0.0M,9.0M,17.0M	Floor levels at AB bay shall be 0.0M,8.5M,17.0M as per std practise. Please confirm	
128	4	ANNEXURE-D	Floor levels in BC bay-- 0.0M,9.0M,17.0M	Floor levels at BC bay shall be 0.0M,8.5M,17.0M as per std practise. Please confirm	
129	4	ANNEXURE-D	Level of Mezzanine floor 9.0m	Mezzanine floor shall be 8.5m as per std practise. Please confirm.	
130	4	ANNEXURE-D	TDBFP at Operating Floor and MDBFP at Ground Floor in AB Bay	TDBFP at Operating Floor and MDBFP at Mezzanine Floor in AB Bay	Bid Specification prevails
131	Vol II - Section 4	Specific Layout considerations (Annexure-D) Sr No. 1.0	AB bay, BC & CD bay widths : 36.0 M, 12.0 M & 12.0M	In line with OEM design and present ongoing Mahagenco project, we propose the turbine building bay width shall be as under: AB bay : 32.0 M, BC & CD bay widths : 12.0 M These dimensions are based on well established practices which meets all O&M criteria. It may also be noted that during recent bulk tender from NTPC, AB bay width has been asked as 29m. The overall cost of the project will unnecessarily increase if dimensions as specified are retained. OEM specific layout meeting specific O&M space requirement should therefore be accepted.	Bid Specification prevails

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
132	Vol II - Section 4	Specific Layout considerations (Annexure-D) Sr No. 4.0, 11.0, 12.0 & 13.0	Floor levels in B-C bay : 0.0 M,9.0 M, 17.0 Location of Deaerator : In BC bay at 38.0 M HP Heaters/LP Heaters at Operating Floor/ Mezzanine Floor respectively in B-C Bay. TDBFP at Operating Floor and MDBFP at Ground Floor in AB Bay.	Floor levels and equipment location shall be decided based on layout concept indicated above for an optimal solution.	Bid Specification prevails
133	Vol II - Section 4	Specific Layout considerations (Annexure-D) Sr No. 15.0	Clear Head room within Main plant Building for pipes, structures & cable trays, ducts etc. : 2.5 M	Refer 1.2.1 & 1.2.2 of Annexure-C. We suggest 2.0 M head room clearance be also accepted.	2.5 m shall be minimum
134	4	Annexure-D, SR no 15	Clear Head room within Main plant Building for pipes, structures & cable trays, ducts etc. : 2.5M	Refer Vol II, Section 4,Annexure-C,Sr no 1.2(page 99 of 555), head room is specified as 2.0M. Please clarify actual requirement.	2.5 m shall be minimum

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**Pre - Bid Queries****Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
135	5	1.12	Apart from Boiler, proper chemical cleaning shall be carried out in following pipe lines/equipment before commissioning (a) Deaerator (b) Boiler feed suction, recirculation leak-off lines (c) Boiler Feed discharge line by passing heaters (d) Attenuation lines (e) Condensate suction & discharge piping upto de-aerator by passing the feed water heaters. (f) Fuel oil lines.	a. Deaerator will be cleaned manually. As per recommended practice, we are not taking Deaerator in chemical cleaning circuit. b. Boiler feed suction and recirculation leak-off lines will be cleaned by DM water flushing. As per recommended practice, we are not taking these pipelines in chemical cleaning circuit e. Condensate suction pipeline will be cleaned by DM water flushing. As per recommended practice, we are not taking this pipelines in chemical cleaning circuit. f. Fuel oil pipelines will be cleaned by Oil flushing followed by air blowing. As per recommended practice, we are not taking this pipelines in chemical cleaning circuit.	Bid Specification prevails
136	5	1.13	...Supply of LDO, chemicals, lubricating oils upto COD.	Please clarify the scope of LDO. LDO is startup fuel and the same should be in scope of the Owner same as coal and HFO	Clause stands deleted. Refer Volume - I
137	5	1.14.10	The successful bidder shall arrange for tower cranes as per requirement for speedy erection activities	Tower crane is not suitable for our erection philosophy. Hence this may not be treated as an essential requirement.	Bid Specification prevails

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
138	5	1.16.12	Preservation of all materials / equipment under custody of the Contractor during storage, pre-assembly & erection, commissioning etc shall be the responsibility of the Contractor. All necessary preservatives and consumables like paints etc shall be arranged by the Contractor. Necessary touch up painting, periodic application of preservatives/ paints on pressure parts/other equipment even after erection until completion of work shall be carried out by the Contractor. The Contractor shall fabricate piping, install lub oil systems and carry out the acid cleaning of fabricated piping. The Contractor shall also service the lub oil system, carry out the hydraulic test of oil coolers etc.	Lub oil pipelines will be cleaned by Oil flushing followed by air blowing. As per recommended practice, we are not taking this pipelines in chemical cleaning circuit.	Agreed
139	6	6.6	Upon review, the Owner/Engineer shall put his remarks and one of the following action stamps on the drawing/ document:	Please clarify the details of category (a), (b), (c) and (d).	Will be finalised during post-award meeting.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**Pre - Bid Queries****Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
140	7	2.4	The Bidder shall also furnish copies of the reference documents / plant standards / acceptance norms/tests and inspection procedure etc as referred in Quality Plans along with Quality Plans. These Quality plans and reference documents/standards etc shall be subject to Owner's approval without which manufacture shall not proceed. These approved documents shall form a part of the contract. In these approved quality plans, Owner/Authorised representative shall identify Customer Hold Points (CHP), test/ checks which shall be carried out in presence of the Owner's Engineer or his authorised representative and beyond which the work will not proceed without consent of Owner/Authorised representative in writing. All deviations to this specification, approved quality plans and applicable standards must be documented and referred to Owner/ Authorised representative for approval and disposal.	1. ITP's shall be submitted to client for identification of Witness Points/ document submission points. Referenced documents in I&T plan will be available at shop for reference at the time of inspection 2. No Customer Holding Point's are offered. Only 'Witness Points' are offered which shall be finalised with customer during pre-award stage. 3. Bidder has proven test plans/procedures. Bidder shall provide reference to the relevant extracts of the acceptance criterion/procedure for the test/inspection.	Will be discussed during detailed engineering.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
141	7	2.4	The Bidder shall also furnish copies of the reference documents/plant standards/acceptance norms/tests and inspection procedures etc as referred in Quality Plans along with Quality Plans. These Quality plans and reference documents/standards etc shall be subject to owner's approval without which manufacture shall not proceed.	Bidder has proven test plans/procedures. As test plans are proprietary to bidder, bidder shall provide reference to the relevant extracts of the acceptance criterion/procedure for the test/inspection. Please confirm acceptance of bidder's standard and proven practice.	Bid Specification prevails
142	7	2.8	All brazers, welders etc employed on any part of the contract at Contractor's/ Sub-Contractor's works or at site shall be qualified as per ASME Section-IX or BS-4871 or equivalent international standard approved by the Owner. Such qualification tests shall be conducted in presence of Owner/his authorised representative.	Procedure Qualification / Welder qualification records at shop will be available for reference at shop. Site welder qualifications shall be furnished to client for approval.	Bid Specification prevails
143	7	2.8	All brazers ,welders etc employed on any part of the contract at contractors/sub contractors works or at site shall be qualified as per ASME section IX or BS4871 or equivalent international standard approved by the owner.Such qualification tests shall be conducted in presence of owner/his authorised representative.	Pre qualified welders/brazers with qualification data are considered as qualified welders/brazers.	Bid Specification prevails

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
144	7	2.9	All Non-Destructive Tests (NDT) shall be carried out in accordance with approved International Standard. The NDT operator shall be qualified as per SNT-TC-IA (of American Society of non- destructive examination). Results of NDT shall be properly recorded and submitted for approval.	The NDT operator shall be qualified as per SNT-TC-IA (of American Society of Non-destructive examination) / EN/ Equivalent.	Will be discussed during detailed engineering.
145	7	2.13	Repair/rectification procedures to be adopted to make any job acceptable shall be subject to the approval of the Owner.	Repairs/ rectification shall be done as per manufacturers recommendation.	Bid Specification prevails
146	7	4.2	The Contractor shall give the Engineer/Inspector fifteen (15) days written notice of any material being ready for testing. Such tests shall be to the Contractor's account except for the expenses of the Inspector. The Engineer/Inspector, unless the witnessing of the tests is virtually waived shall attend such tests within fifteen (15) days of the date on which the equipment is notified as being ready for test/inspection failing which the Contractor may proceed with test which shall be deemed to have been made in the Inspector's presence and he shall forthwith forward to the Inspector duly certified Six (6) copies of test reports.	We propose to keep the same as 10 days or less as it has been in case of earlier projects. 15 days for each and every stage would delay the process on a large extent.	Clause stands deleted;Regarding notice for inspection, provision of CI 3, Section 2A Volume I prevail.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
147	7	4.3	The Engineer or Inspector shall within fifteen (15) days from the date of Inspection as defined herein give notice in writing to the Contractor, on any objection to any drawings and all or any equipment and workmanship which is in his opinion not in accordance with the contract. The Contractor shall give due consideration to such objections and shall either make modifications that may be necessary to meet the said objections or shall confirm in writing to the Engineer/Inspector giving reasons therein, that no modifications are necessary to comply with the contract.	We propose to keep the same as 10 days or less as it has been in case of earlier projects. 15 days for each and every stage would delay the process on a large extent.	Reg notice for inspection, provision of Cl 3, Section 2A Volume I prevail.
148	7	4.4	When the factory tests have been completed at the Contractor's or sub-contractor's works, the Engineer/Inspector shall issue a certificate to this effect within fifteen (15) days after completion of tests but if the tests are not witnessed by the Engineer/ Inspectors, the certificate shall be issued within fifteen (15) days of the receipt of the Contractor's test certificate by the Engineer/Inspector. Failure of the Engineer/ Inspector to issue such a certificate shall not prevent the Contractor from proceeding with the works. The completion of these tests or the issue of the certificates shall not bind the Owner to accept the equipment should it, on further tests after erection be found not to comply with the contract.	We propose to keep the same as 10 days or less as it has been in case of earlier projects. 15 days for each and every stage would delay the process on a large extent.	Clause stands deleted;Regarding notice for inspection, provision of Cl 3, Section 2A Volume I prevail.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
149	7	2.8	For welding of pressure parts and high pressure piping, the requirements of IBR shall also be complied with.	For all IBR pressure parts and high pressure piping welding, the latest applicable requirements of the IBR (Indian Boiler Regulation) shall be essentially complied with. However, other piping shall be as per relevant code.	Specification is self-explanatory

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
150	7	Annexure A	FORMAT OF QUALITY ASSURANCE PROGRAMME ANNEXURE - A	We understand that referred format is for Manufacturing quality plan. Bidder requested the following approach on quality (I & T) Plans a. For bidder's equipment (Turbine, Generator, auxiliaries, Heat exchangers, DCS) - The ITPs/ status will be provided as per Bidder's standard formats. It is not feasible to transfer these into NTPC's format b. For BOP equipment, Quality plans shall be submitted in Annexure A- format	Bid Spec prevails
151	7	2.5	No material shall be despatched from the manufacturer's works before the same is accepted subsequent to pre-despatch final inspection including verification of records of all previous tests/inspections by Owner's Engineer/Authorised representative and duly authorised for despatch issuance of Material Despatch Clearance Certificate (MDCC).	The requirement of MDCC shall be limited to only major equipment, the list of which can be agreed upon as part of billing break-up. For such equipment, final certificate shall be provided for purpose of issuance of MDCC. MDCC to be obtained from the customer for the major subsystems before dispatch from the factory / Supplier to the site.	Clause 4., Section 2A Volume I prevail.
152	8	1.1.8 (III)	The P. G. test shall be carried out within four (4) months after first synchronisation. If the P.G. test is conducted beyond four (4) months from first synchronisation due to any reason attributable to Owner, the deterioration in performance shall be increased by the following amount for each month or part of the month by which the period between the first synchronisation and PG test exceeds four (4) months. (i) 0.1 % for the following eight (8) months (ii) 0.06 % for the period following thereafter.	As per tender specification P. G. test shall be carried out in line with ASME PTC 6. Aging shall be considered in line with ASME PTC 6 Report. We request you to accept the bidders proposal.	Bid Specification shall prevail

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
153	8	1.2.1	Efficiency of the steam generator at 100% TMCR while firing the design coal at rated steam parameters, rated coal fineness and rated excess air.	We propose to offer, Plant gross cycle heat rate at 100% TMCR (taking into account the steam generator efficiency) with 0% make-up, generator power factor of 0.85, design cooling water inlet temperature and Design coal firing (based on GCV) at rated steam parameters. For Steam parameters refer our comments/ queries raised in the pre-bid queries lotI/II. We request you to accept our proposal.	Bid Specification prevails
154	8	1.2.3	Guaranteed Turbine Cycle Heat rate in kCal/kWh under rated steam conditions, design condenser pressure with zero make up at 100% and 80% rated load. A weightage of 4 (four) and 3 (three) shall be considered for 100% and 80% heat rate values for arriving at the net heat rate.	As per Vol I, Section 3, Cl. no. 6.3, LD is applicable on Gross TG heat rate guarantee at 100% TMCR. As per Vol I, Section 1, Cl. no. 19, evaluation loading is applicable on 100% unit load at generator terminals. Also As per Vol. I, Section 1, Schedule 7 maximum gross TG Heat rate to be guaranteed. However as per this clause weightage average shall be considered for 100% and 80% heat rate values for arriving at the net heat rate. In our opinion, plant gross heat rate for EPC contract should be applicable. Please confirm.	Bid Specification shall prevail
155	8	1.2.3	Heat rate	We understand that the heat rate to be guaranteed is the gross turbine cycle heat rate. The formula for weighted average heat rate is expected to be as below $- (4 \times \text{HR}(100\%) + 3 \times \text{HR}(80\%)) / 7$ Please confirm	Confirm

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**Pre - Bid Queries****Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
156	8	1.2.4	Guaranteed Continuous TG output under rated steam conditions, design condenser pressure with zero make-up. Note: The condenser pressure while conducting the guarantee tests shall be measured at 300 mm above the top row of condenser tubes.	We propose 100% Gross STG power output with 0% make-up and with design cooling water inlet temperature' generator power factor of 0.85 excluding excitation power, and Design coal firing (based on GCV) at rated steam parameters. We request you to accept our proposal.	Bid Specification prevails
157	8	1.2.4	GUARANTEES UNDER CATEGORY-1 Guaranteed Continuous TG output under rated steam conditions, design condenser pressure with zero make-up.	"Guaranteed Continuous TG output at 100%TMCR under rated steam conditions, design condenser pressure with zero make-up." Reason: We understand TG output of 100% TMCR is the guarantee item. Please confirm.	Confirmed

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**Pre - Bid Queries****Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
158	8	1.2.5	The total auxiliary power consumption for all specified plant auxiliaries (as listed in Volume- I, Section -3) required for continuous unit operation at 100% of rated load under rated steam conditions and at design condenser pressure with 1% make-up.	(1) As per Vol II, Section 8 cl. no. 1.2.5 for Performance Guarantee Schedule, 1% make up to be considered for auxiliary consumption. (2) As per Vol. I, Sec 3, cl. no. 6.3 for LD and Vol. I, Sec 1, cl. no. 19.1 for Loading for Bid Price, Auxiliary consumption are given in per kWh basis, however as per Vol. I, Sec. 1, Schedule 7 for guarantee schedule 7, auxiliary consumption is to be guaranteed in kW. (3) As per Vol. I, Sec 3, cl. no. 6.3 for LD and Vol. I, Sec 1, cl. no. 19.1 for Loading for Bid Price, the auxiliary consumption is to be considered at 100% TMCR condition, however in the description of list of auxiliaries to be considered (Vol. I, Sec 3, cl. no. 6.3), it is specified that the individual plant and equipment are to be considered at full load/capacity / design capacity. Please clarify the requirement. In view of above, we propose following for auxiliary power consumption, The total auxiliary power consumption for all specified plant auxiliaries (as listed in Volume- I, Section -3) required for continuous unit operation at 100% of rated load under rated steam conditions and with 0% make-up, generator power factor of 0.85, design cooling water inlet temperature and Design coal firing (based on GCV).	1). Auxiliary Power Consumption shall be at zero % make up. 2). KWh is an error; it shall be read as kW. 3).The auxiliary power consumption shall be considered at 100 % TMCR

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Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
159	8	1.2.5	GUARANTEES UNDER CATEGORY-1 The total auxiliary power consumption for all specified plant auxiliaries (as listed in Volume-1, Section- 3) required for continuous unit operation at 100% of rated load under rated steam conditions and at design condenser pressure with 1% make-up.	"The total auxiliary power consumption for all specified plant auxiliaries (as listed in Volume-1, Section- 3) required for continuous unit operation at 100% of rated load under rated steam conditions and at design condenser pressure with <u>zero 1%</u> make-up." Reason: We understand auxiliary power consumption is guaranteed with zero make-up condition according to Vol.I Section-1 clause 19.1 Sr. No.4 and Vol.I Section-3 clause 6.3 Sr. No.1. Please confirm.	Confrimed
160	8	1.4.1	Steam generator parameters with Blended Coal: The steam generator shall be run continuously for 168 (one hundred and sixty eight) hours with blended coal at 70:30 ratio between domestic coal and imported coal for demonstration of stable operation at rated parameters.	The proposed boiler is suitable for firing blended coal comprising 70% Indian coal & 30% imported coal. However, customer to specify the Proximate analysis, Ultimate analysis, GCV, HGI, & Ash analysis of such fuel blend & install scientific blending plant such that during demonstration test, the test fuel blend conforms to the specified fuel blend.	Please refer coal analysis furnished in corrigendum-II
161	8	1.4.1	Steam generator parameters with Blended Coal : The steam generator shall be run continuously for 168 (one hundred and sixty eight) hours with blended coal at 70 : 30 ratio between domestic coal and imported coal for demonstration of stable operation at rated parameters.	Steam generator shall run continuously during trial opration as per vol. I sec 2 (GCC), cl. No. 37.3. Since the trial run operation covers the requirement specified in this guarantee, hence separate demonstration guarantee is not required. We request you to delete the requirement of category III guarantee.	bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
162	8	1.4.2	Steam turbine generator rated capacity at 89 mm Hg Condenser pressure.	Simulating the condition of maximum condenser pressure at site and operating plant for demonstration of this guarantee is difficult. The mechanism for demonstration of the test shall be discussed and evolved during detailed engineering stage and test if required shall be done during the commissioning test and not under demonstration guarantee. We request you to delete the requirement of category III guarantee.	Since condensing and cooling water system parameters are bidder specific, this aspect will be reviewed after review of heat balance conceived by the bidder.
163	8	1.4.3	Run back capabilities. The automatic runback capability of the unit (boiler-turbine-generator) on loss of critical auxiliary equipment (such as tripping of one ID/FD/PA fan/airheater/BFP/ CEP etc) shall be demonstrated ensuring smooth and stable runback operation.	These capabilities of the plant can be checked as a part of commissioning test and hence request you to delete the requirement of category III guarantee.	bid specification prevail
164	8	1.4.4	Rate of change of load and sudden load change withstand capability The capability of boiler-turbine-generator in regard to ramp rate and step load change as specified shall be demonstrated.	These capabilities of the plant can be checked as a part of commissioning test and hence we request you to delete the requirement of category III guarantee.	bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
165	8	1.4.5	Mill capacity at rated fineness Performance testing shall be done on coal mills toward establishing its capacity specified at the rated fineness, applying corrections for the variation in coal characteristics i.e. HGI (Hardgrove Grindability Index) and total moisture. Capacity demonstration test shall be carried out for the following conditions: (a) Capacity output of one coal pulverizer (of Owner's choice) shall be demonstrated for establishing its capacity at 100% mill loading, at rated pulverized coal fineness with specified design coal with new set of grinding elements. (b) Capacity output shall also be demonstrated on four coal pulverizers (of Owner's choice) of Steam Generator, not less than the 90% of guaranteed value of (a) above, at 100% mill loading with the originally installed grinding elements in nearly worn-out condition or at the end of guaranteed wear life of grinding elements, whichever is earlier. Capacity test as mentioned at (a) & (b) above shall be demonstrated at the following conditions occurring simultaneously during testing: Coal fineness Not less than 70% through 200 mesh and not less than 99% through 50 mesh screen Test Coal Any available coal from the specified range In case the guaranteed	Fineness through 50 mesh shall be 98%.	bid specification prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
			capacity of coal pulverizers as stated above are successfully demonstrated, remaining coal pulverizers will also be considered to have successfully met the above capacity guarantee requirement. However, in the event of any of the coal pulverizers not meeting the guarantee test, all the coal pulverizers will have to be tested to demonstrate guaranteed capacity.		
166	vol- II,sec-8, pg 169-555	1.4.5	Capacity demonstration test shall be carried out -----	Capacity test of ONE mill at rated capacity (i.e 90% of the Mill max. theoretical capacity) will be done for establishing its capacity at rated pulverized coal fineness (i.e 70% through 200 mesh and 98% through 50 mesh) and specified "design coal", applying corrections for variation in HGI, Moisture and PF Fineness.The capacity test shall be done in ONE Mill after 3000 hours of Mill Operation.	bid specification prevail
167			a) Capacity output of one coal pulveriser -----100% mill loading at rated pulverised coal fineness with specified design coal with new set of grinding elements		bid specification prevail
168			b)Capacity output shall also be demonstrated on four coal pulveriser --90% of the guaranteed value of (a)--- in nearly worn out condition or at the end of guaranteed wear life of grinding elements whichever is earlier.		bid specification prevail
169	vol-II, sec-8, pg-170-555	1.4.5	Capacity test as -----during testing	Capacity shall demonstrated at the following conditions coal fineness : 70% through 200 mesh and 98% through 50 mesh at specified "design coal", applying corrections for variation in HGI, Moisture and PF Fineness, where required.	Bid Specification prevails
170			Coal Fineness : not less than 70% through 200 mesh and not less than 99% through 50 mesh.		

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Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
171			Test coal : Any available coal from the specified range.		
172	vol-II, sec-8, pg-169-555	1.4.5	Performance testing shall be done on each mill towards establishing its capacity specified at the rated fineness, applying corrections for the variation in coal characteristics, i.e HGI & Total Moisture.	Capacity test of ONE mill at rated capacity (i.e 90% of the Mill max. theoretical capacity) will be done for establishing its capacity at rated pulverized coal fineness (i.e 70% through 200 mesh and 98% through 50 mesh) and specified design coal, applying corrections for variation in HGI, Moisture and PF Fineness, where required.	
173	8	1.4.6	Life of mill wear parts Life of mill wear parts, in hours of operation, for the entire range of coal characteristics specified.	Wear life for grinding elements shall be 6000 hours with a coal of max. 50 YGP. Correction curve supplied by MILLS shall be used if actual coal being grinded is of a higher YGP. Wear life shall be defined as achievement 100 mm of wear on grinding rolls and 45 mm of wear on BRS.	bid specification prevail
174	8	1.4.7	No fuel oil support above 30% BMCR load It shall be guaranteed that oil support for flame stabilization shall not be required beyond 30% of BMCR load when firing the coals from the range identified. It shall be demonstrated that with any combination of mills/ adjacent mills in service, the steam generator does not require any oil firing for stable and efficient boiler operation at and above 30% BMCR loads.	The minimum stable load without fuel oil support shall be 40% of BMCR load, with two adjacent mills in service and mill loading not less than 50%	bid specification prevail

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Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
175	8	1.4.8	Performance characteristics of fans The performance characteristics of FD, ID and PA fans including their capacity, head developed, power consumption and margins envisaged on capacity and head shall be demonstrated.	These capabilities of the plant can be checked as a part of Routine Test/ Shop Test or Commissioning test and hence we request you to delete the requirement of catagory III guarantee.	bid specification prevail
176	8	1.4.9	Equal load sharing of pumps/fans while running in parallel shall be demonstrated.	These capabilities of the plant can be checked as a part of Commissioning test and hence we request you to delete the requirement of catagory III guarantee..	bid specification prevail
177	8	1.4.9	Equal load sharing of pumps/fans while running in parallel shall be demonstrated	Equal load sharing of pumps/fans while running in parallel is not achievable and hence shall not be demonstrated.	bid specification prevail
178	8	1.4.10	Steam temperature imbalance It shall be demonstrated at SH and RH outlets (in case of more than one outlet) that the temperature imbalance between the outlets does not exceed 10 deg. C under all loads including transients.	The SH & RH temperature imbalance between the outlets are considered maximum 30 °C differential during steady state operation only	bid specification prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**Pre - Bid Queries****Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
179	8	1.4.11	It shall be guaranteed and demonstrated that the spray water flow to SH attemperation system does not exceed the value considered for design (to be indicated in the bid) while maintaining the rated SH outlet steam temperature at BMCR. It shall also be guaranteed and demonstrated that the RH temperature is maintained at the rated value without any spray water requirement, at all loads for which the specified RH steam temperature is required to be maintained at the rated value.	SH spray shall be maintained at around 4% at all operating loads. RH spray shall be zero at guarantee load of 100% TMCR only.	bid specification prevail
180	8	1.4.11	It shall be guaranteed and demonstrated that the spray water flow to the SH attemperation system does not exceed value considered for design while maintaining the rated steam temepatrue at BMCR	Please clarify the mechanism for demonstration of guarantees relating to BMCR load at site.	Will be evaluated after recepit of detailed scheme by bidder.
181	8	1.4.12	Furnace Exit Gas Temperature (FEGT) It shall be demonstrated that maximum furnace exit gas temperature (FEGT) shall be minimum 60 Deg C below the minimum initial deformation temperature (IDT) of ash. A comprehensive thermal performance test (TPT) shall be conducted for this purpose. FEGT shall be demonstrated through such TPT by indirect measurement.	The furnace exit gas temperature shall be at least 60°C below IDT at the plane downstream of the RH finish section because (1) RH finish section is a platenized surface (SI/D of 1.15 < 1.2) and (2) the St is greater than 15" (381mm) which ASME defines as the dividing line between radiant and convective sections.	Bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
182	8	1.4.13	Air Heater exit temperature.	Since Air heater exit temperature forms the part of Steam generator Efficiency guarantee which is forming a part of category I guarantee. Hence we request you to delete the requirement of category III guarantee.	Bid specification prevail
183	8	1.4.14	Air heater air-in-leakage It shall be demonstrated that the air-heater air-in-leakage and maximum drift in air leakage do not exceed the specified value.	These capabilities of the plant can be checked as a part of Commissioning test and hence we request you to delete the requirement of category III guarantee..	Bid specification prevail
184	8	1.4.15	Electrostatic Precipitator (a) The performance/acceptance tests shall be carried out in accordance with method-17 of EPA (Environmental Protection Agency of USA) code ASME PTC. (b) The ESP air in leakage shall not be more than 1% of total gas flow at ESP inlet at the guarantee point condition and shall be demonstrated. (c) The maximum pressure drop through the ESP at the guarantee point flow condition shall not exceed 20 mmWC which shall be demonstrated. (d) The gas distribution in the various stream and fields shall be demonstrated.	(b) Air Leakage shall have impact on performance of ESP as well as auxiliary power consumption of the Fan, which are already covered in the category I guarantees. Hence we request to delete the requirement of guarantee under category III for air leakage. Air leakage can be tested as a part of commissioning test if required. (c) Pressure drop guarantee across ESP is not required to be guaranteed separately under category III, since same shall have impact on auxiliary power consumption which is covered in category I guarantees for the overall plant. We request to delete the requirement of category III guarantee for pressure drop across Air Heater. (d) The requirement of gas distribution again has impact on the overall performance of the ESP, which is covered under category III guarantee. Gas distribution shall be checked as a part of commissioning test and hence we request request to delete the requirement of category III guarantee.	Bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
185	8	1.4.16	Turbine-Generator set capability The steam turbine generator shall be capable of delivering at generator terminals the output as indicated in the heat balances under the following conditions: (a) Continuous TG output corresponding to VWO condition under rated steam conditions with 1% make up. While conducting this test, the condenser pressure measurement shall be done at 300 mm above the top row of condenser tubes. (b) Maximum continuous output at generator terminals corresponding to all HP Heaters out of operation under rated steam conditions with 1% make up.	(a) This is interpreted as an capability guarantee. The bidder shall have the right to adapt the massflow to demonstrate the output guarantee. Please confirm. (b) This capability of TG to deliver output at specified condition can be checked as a part of commissioning test and hence we request you to delete the requireriment of category III guarantee.	(a). Will be evaluated after recepit of detailed scheme by bidder (b). Bid Specification prevails.
186	8	1.4.16(a)	GUARANTEES UNDER CATEGORY-III Turbine-Generator set capability Continuous TG output corresponding to VWO condition under rated steam conditions with 1% make up.	"Continuous TG output corresponding to VWO condition under rated steam conditions <u>and at design condenser pressure</u> with 1% make up. " Reason: We understand TG output corresponding to VWO is guaranteed at design condenser pressure condition according to Vol.III-B Section-1 clause 3.4. Please confirm.	Confirmed

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
187	8	1.4.16(b)	GUARANTEES UNDER CATEGORY-III Turbine-Generator set capability Maximum continuous output at generator terminals corresponding to all HP Heaters out of operation under rated steam conditions with 1% makeup.	"Maximum continuous output at generator terminals corresponding to all HP Heaters out of operation under rated steam conditions <u>and at design condenser pressure</u> with 1% makeup." Reason: HTC understand Maximum continuous output at generator terminals corresponding to all HP Heaters out of operation is guaranteed at design condenser pressure condition, which is same as other guarantee conditions. Please confirm.	Confirmed
188	8	1.4.17 (a)	Start-up, Loading, Unloading and Shutdown capabilities (For Turbine Generator) Unit Start Up Start-up time (upto full load) and loading capabilities for Turbine Generator together for cold start condition (greater than 36 hrsshutdown), warm start conditions (between 8 and 36 hrs shutdown) and hot start conditions (less than 8 hours shutdown) as indicated by the contractor in the offer and accepted by the Owner shall be demonstrated ensuring that the various turbine operational parameters like vibration, absolute and differential expansion, eccentricity and steam-metal temperature mismatch etc are within design limits.	These capabilities of the plant can be checked as a part of Commissioning test and hence we request you to delete the requirement of catagory III guarantee..	Bid Specification shall prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
189	8	1.4.17 (b)	Sudden Total Loss of External Load On occasions, the steam turbine generator unit may experience sudden total loss of all external load. Under these conditions, the steam turbine generator unit shall not trip but shall continue to be in operation under the control of its speed governor to supply power for the plant auxiliary load with HP-LP bypass in operation while staying within the agreed limits of steam to metal temperature mismatch, exhaust hood temperature, absolute and differential expansion, vibration and eccentricity. The same shall be demonstrated.	These capabilities of the plant can be checked as a part of Commissioning test and hence we request you to delete the requirement of catagory III guarantee..	Bid Specification shall prevail
190	8	1.4.17 (c)	Steam Metal Temperature Mismatch Limitation The steam-metal temperature differential for cold, warm and hot start up, loading/unloading and shutdown conditions shall be within the permissible limits indicated by the Bidder in the offer and accepted by the Owner.	These capabilities of the plant can be checked as a part of Commissioning test and hence we request you to delete the requirement of catagory III guarantee..	Specification is self-explanatory

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
191	8	1.4.18	Constant Pressure and Sliding Pressure Operation - The constant pressure operation from 0 to 35/40% of TMCR & 90% TMCR to VWO condition and sliding pressure operation from 35/40% to 90% TMCR in conjunction with the steam generator, HP-LP bypass system and Instrumentation & Control system shall be demonstrated. In sliding pressure mode of operation, during quick load increase, the idle control valve (s) must respond rapidly to pick up 20% of operating load, so that immediate increase of boiler pressure is not required. The load response capability shall be demonstrated in steps of 5%. Changeover from constant pressure mode to sliding pressure mode and vice-versa shall also be demonstrated.	These capabilities of the plant can be checked as a part of Commissioning test and hence we request you to delete the requirement of catagory III guarantee. We propose following operation concept as per standard and proven practice of the Bidder : 1) 0 to 40% TMCR: Constant Pressure Operation. 2) 40% TMCR to 100% TMCR: Pure Sliding Pressure Operation, with instantaneous output increase of 5% achieved through overload valve. This is in accordance to cl. no. 4.8 (d) of Grid Code (L/68(84)/2006-CERC, dtd: 14/03/2006). 3) 100% TMCR to 105% TMCR: Constant Pressure Operation through overload valve. The generating unit shall be capable of instantaneously increasing the output by 5%, limited to 105% TMCR as per cl. no. 4.8 (d) of Grid Code (L/68(84)/2006-CERC, dtd: 14/03/2006). No throttling is envisaged in sliding pressure operation.	Will be evaluated after receipt of detailed scheme by bidder.

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
192	8	1.4.19	Generator Capability The Generator stator and rotor windings inclusive of main and neutral leads shall be provided with Class-F insulations but rated for class-B temperature rise. The maximum permissible temperature of different parts of the generator for continuous operation shall be as specified in IEC 34- 1/34-3 as applicable.	The generator is designed to operate within class B temperature rise limits acc. to IEC 60034-1 at rated cooling conditions as applicable. The temperature margin resulted from class F insulation and class B temperature rise limits provides temperature safety margin due to hot spots and generator reliability over its life time. Therefore, it is neither possible nor allowed to demonstrate the Class F insulation (155°C) by performing generator temperature rise test up to Class F insulation limit (155°C). Please note that the temperature rise test on site, if performed, is to prove that any of the measured temperatures of generator parts will not reach class B temperature rise limits acc. to IEC 60034-1 at rated load of the generator. All insulating materials used to insulate active parts of the generator are ordered from ALSTOM qualified suppliers with specified F insulation temperature class 155°C (at least) acc. to IEC 62114 and that is indicated on incoming material certificates. We request to delete the requiriment of catagory III guaantee as specified.	Bid specification prevail
193	8	1.4.20	Short Circuit Capability The Generator shall be capable of withstanding a 3-phase short circuit at the generator terminals when operating at maximum continuous rated MVA and rated power factor, 105% rated voltage and with fixed excitation for 3 seconds as per IEC 34-4.	This requirement specified is a design requirement and not a test requirement. IEC or IEEE standards also do not requires to demonstrate same at the specified conditions. Moreover, such sudden short-circuit is not normal operation condition. Hence we request to delete the requiriment of catagory III guarantee.	Bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
194	8	1.4.21	Excitation System Performance (a) The excitation system shall be capable of supplying field forcing for Thirty (30) seconds in case of all types of faults, including close in faults of the generator. (b) The ceiling voltage shall not be less than 150% of the machine excitation voltage. (c) Nominal excitor response ratio shall not be less than 3.0 per second.	These capabilities of the plant can be checked as a part of Commissioning test and hence we request you to delete the requirement of catagory III guarantee..	Bid specification prevail
195	8	1.4.22	Capacity with Reduced Hydrogen Pressure Generator shall be capable of operating at reduced capacity at reduced generator hydrogen pressure in accordance with values furnished.	These capabilities of the plant can be checked as a part of Commissioning test and hence we request you to delete the requirement of catagory III guarantee.	Bid specification prevail
196	8	1.4.23 (a)	(a) The value of design condenser pressure to be measured at 300 mm above the top row of condenser tubes shall be guaranteed under VWO condition, 1% make-up, design C.W. inlet temperature and C.W. flow. The condenser vacuum shall be measured with a vacuum grid utilizing ASME basket tips.	Since the condenser pressure is forming part of Heat rate guarantees, separate demonstration guarantee at other conditions are not requiried. we request you to delete the requirement of catagory III guarantee. We also request you to review the pre-bid query/comment regarding the condenser design point.	Bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
197	8	1.4.23 (b)	(b) Temperature of condensate, at outlet of condenser, shall not be less than saturation temperature corresponding to the condenser pressure at all loads.	Please appreciate that even with our highly optimised tube layout and uniform steam distribution arrangement, minimum subcooling or practically zero sub-cooling may not be ruled out at certain loads and hence Temperature of condensate, at outlet of condenser, shall be near to saturation temperature corresponding to the condenser pressure at all loads. This query was also raised in the first set of pre-bid queries. Please confirm. Also the tempearature of condensate at outlet of condenser is forming part of Heat rate guarantees, separate demonstration guarantee at other conditions are not requiried. Hence we request you to delete the requirement of catagory III guarantee.	Will be evaluated after receipt of detailed scheme by bidder.

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
198	8	1.4.23 (b)	Temperature of condensate, at outlet of condenser, shall not be less than saturation temperature corresponding to the condenser pressure at all loads.	Please appreciate that even with our highly optimised tube layout and uniform steam distribution arrangement minimum subcooling or practically zero may not be ruled out at certain loads and hence Temperature of condensate, at outlet of condenser, shall be near to saturation temperature corresponding to the condenser pressure at all loads. Please confirm.	Will be evaluated after receipt of detailed scheme by bidder.
199	8	1.4.23 (d)	Air leakage in the condenser under full load condition shall not exceed more than 50% of design value taken for sizing the condenser air evacuation system.	The requirements specified shall be tested as a part of Commissioning test and hence we request you to delete the requirement of category III guarantee.	Bid specification prevail
200	8	1.4.23 (e)	When one half of the condenser is isolated, condenser shall be capable of taking at least 60% T.G. load under TMCR conditions.	The capability requirement specified shall be checked as a part of Commissioning test and hence we request you to delete the requirement of category III guarantee.	Bid specification prevail
201	8	1.4.23 (f)	The capacity of each vacuum pump in free dry air under standard conditions at a condenser pressure of 25.4 mm Hg (abs) and sub cooled to 4.17°C below the temperature corresponding to absolute suction pressure shall be demonstrated. Correction curves for establishing the capacity at site conditions shall also be furnished.	The capability requirement specified shall be checked as a part of Commissioning test and hence we request you to delete the requirement of category III guarantee.	Bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
202	8	1.4.23 (g)	The air and vapour mixture from air cooling zone of condenser shall be 4.17°C below the saturation temperature corresponding to 25.4 mm Hg (abs) suction pressure. Correction curves for establishing the same at site conditions shall also be furnished.	The requirements specified shall be tested as a part of Commissioning test and hence we request you to delete the requirement of category III guarantee.	Bid specification prevail
203	8	1.4.24	Condensate Extraction Pumps (a) Each CEP set shall be capable of delivering flow and total dynamic head corresponding to run out point as specified. (b) The vibration, noise level and parallel operation of any two of the three pumps shall be demonstrated.	The requirements specified shall be tested as a part of Commissioning test and hence we request you to delete the requirement of category III guarantee.	Bid specification prevail
204	8	1.4.25	Vacuum Pump (a) Each pump shall be capable of meeting functional requirements. (b) The vibration, noise level and parallel operation of the pumps shall be demonstrated.	(a) This is already covered in cl. No. 1.4.23 (d), (f) & (g), hence delete this clause from here due to repetition of requirement. (b) The requirements specified shall be tested as a part of Commissioning test and hence we request you to delete the requirement of category III guarantee.	Bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
205	8	1.4.26	Boiler Feed Pumps (a) Each Boiler Feed Pump set shall be capable to deliver flow and total dynamic head corresponding to runout point as specified elsewhere. (b) The vibration, noise level and parallel operation of the pumps shall be demonstrated as per specification requirements. (c) Cold startup/hot startup of the unit using TDBFP with motive steam from auxiliary steam header shall be demonstrated.	(a) & (b) The requirements specified shall be tested as a part of Commissioning test and hence we request you to delete the requirement of category III guarantee. (c) Bidder requests Owner to delete this Category-III guarantee as unit start-up requirement using TDBFP is not envisaged in respective specification and customer PFDs i.e. PE-189-PF-204 & PE-189-PF-205. Auxiliary steam if considered for BFP Drive turbine operation then operation of drive turbine becomes inefficient with primary source of steam and is loss of cycle heat rate. It is therefore recommended to use 2 x 30% MDBFP for starting of the plant in case of cold startup/ Hot start up.	Bid specification prevail
206	8	1.4.27	Drip Pumps (if envisaged) (a) Each Drip Pump shall be capable of delivering flow and total dynamic head corresponding to design point as specified. (b) The vibration, noise level shall be demonstrated.	The requirements specified shall be tested as a part of Commissioning test and hence we request you to delete the requirement of category III guarantee.	Bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
207	8	1.4.28	Lube Oil Purification system capacity and purity (a) Lube Oil Purification system capacity and purity shall be demonstrated (with requisite correction curves for variation in inlet oil purity). (b) The maximum solid particle size and free moisture in the purified oil shall not exceed the specified values and quality of oil shall confirm to class 15/12 (as per ISO 4406) when centrifuging oil is heated to a temperature of not more than 65°C.	The requirement specified shall be tested as a part of Routine Test/ Type Test/ Commissioning test and hence we request you to delete the requirement of category III guarantee.	Bid specification prevail
208	8	1.4.29	Auxiliary/Equipment Cooling Water system (a) Vibration, parallel operation and noise level of all pumps at the rated duty point shall be demonstrated at site. (b) Design heat load of plate type heat exchangers and inlet and outlet temperatures of the plate type heat exchangers on the primary and secondary side to be demonstrated at site. Pressure drop across the plate type heat exchanger on the primary and secondary water circuit to be demonstrated at site.	(a) The requirement specified shall be as a part of Routine Test/ Commissioning test and hence we request you to delete the requirement of category III guarantee. (b) Design heat load shall be demonstrated however since the pressure drop across PHE has impact on auxiliary consumption of pumps and same being covered in total auxiliary consumption plant, we request you to delete this requirement from category III guarantee.	Bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
209	8	1.4.30	Condenser Cooling Water Pumps (a) Each Condenser Cooling Water pump set shall be capable to deliver flow and total dynamic head corresponding to runout point as specified elsewhere. (b) Vibration, parallel operation and noise level of all pumps shall be demonstrated at site.	The requirement specified shall be tested as a part of Routine Test/ Type Test/ Commissioning test and hence we request you to delete the requirement of category III guarantee.	Bid specification prevail
210	8	1.4.31	HP/LP Bypass capabilities The HP/LP Bypass system shall satisfy the following functional requirements under automatic interlock action. It shall come into operation automatically under the following conditions: (a) Generator Circuit breaker opening. (b) HP/IP stop valves closing due to turbine tripping. (c) Sudden reduction in demand to house load Under all these conditions while passing the required steam flows as per the relevant heat balances, the condenser shall be able to swallow the entire steam without increasing the exhaust hood temperature and condenser pressure beyond the maximum permissible value indicated by the BIDDER in his offer and accepted by the OWNER.	The requirement/ Capacity specified shall be tested as a part of Commissioning test and hence we request you to delete the requirement of category III guarantee.	Bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
211	8	1.4.32 (a)	Dissolved O ₂ content in feed water at deaerator outlet without chemical dosing at all loads, not to exceed 0.005 cc/litre determined as per ASTM-D-888 – Reference method-A or Indigo Carmine method.	Dissolved oxygen content in feed water at deaerator outlet shall be as per HEI. Kindly accept.	Bid specification prevail
212	8	1.4.32	(a) Dissolved O ₂ content in feed water at deaerator outlet without chemical dosing at all loads, not to exceed 0.005 cc/litre determined as per ASTM-D-888 – Reference method-A or Indigo Carmine method.	Our understanding is that dissolved oxygen in feedwater at deaerator outlet of 0.005 cc/litre is from 50~100% load without chemical dosing. Please clarify.	Will be evaluated after receipt of detailed scheme by bidder.
213	8	1.4.32 (c)	Continuous and efficient operation and performance of feed heating plant without undue noise and vibrations at all loads and duty conditions.	The requirements specified shall be tested as a part of Commissioning test and hence we request you to delete the requirement of catagory III guarantee.	Bid specification prevail
214	8	1.4.33	Automatic on-line Turbine Testing (ATT) system On-load testing of turbine protective equipments shall be demonstrated without disturbing normal operation and keeping all protective functions operative during the test.	The requirements specified shall be tested as a part of Commissioning test and hence we request you to delete the requirement of catagory III guarantee.	Bid specification prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
215		1.4.34	All the plant, equipment and systems shall perform continuously without exceeding the noise level over the entire range of output and operating frequency specified. Noise level measurement shall be carried out using applicable and internationally acceptable standards. The measurement shall be carried out with a calibrated integrating sound level meter meeting the requirement of IEC 651 or BS 5969 or IS 9779. Sound pressure shall be measured all around the equipment at a distance of 1.0 m horizontally from the nearest surface of any equipment/ machine and at a height of 1.5 m above the floor level in elevation. Corrections for background noise shall be considered in line with the applicable standards.	The near field noise measurements will be performed according to the standard ISO 3746:2010 in several test points, chosen regularly distributed on an enveloping measurement surface at a horizontal distance of 1 m from the equipment outline and at a height of 1.5 m above the ground or walkways.	Bid specification prevail
216	8	1.4.35	Condensate Polishing Unit (a) Effluent quality at outlet of each vessel at its rated design flow and design service length between two regenerations (with requisite correction curves for variation in the influent quality). (b) Pressure drop across the polisher service vessel, as specified, in clean and dirty condition of resin at rated design flow.	(b) Pressure drop across vessels shall have impact on auxiliary power consumption which is covered in Auxiliary power consumption guarantees and hence request to delete pressure drop across vesseld from category III guarantees.	Agreed

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
217	8	1.4.36	Superheater and Reheater Temperature Control Test This test shall be conducted to guarantee that SH/RH temperatures are maintained within +/- 5°C of rated temperature condition from 40% to 100% TMCR including conditions: HP Heaters out of operations, HP-LP Bypass operation.	The superheat and reheat steam temperatures at SH and RH outlet shall be maintained within +/- 5°C of rated temperature condition from 60% BMCR to 100% BMCRs per the volume IIIA/Section-1/ Clause 10.4 & 10.5 / Page No 88 of 223.	50% to 100%
218	8	1.4.36	Superheater and Reheater Temperature Control Test: This test shall be conducted to guarantee that SH/RH temperatures are maintained within +/- 5°C of rated temperature condition from 40% to 100% TMCR including conditions: HP Heaters out of operations, HP-LP Bypass operation	Our understanding is that load range is 60~100% as per Cl. No. 1.12, Section 1, Volume IIIA, Page 84 of 223. Please clarify.	50% to 100%

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
219	8	1.4.37	Flue Gas Temperature demonstration The Bidder shall demonstrate that flue gas temperature at the entry and exit of various Boiler heating surfaces and also the variation across the cross section perpendicular to gas flow do not exceed the values considered for the pressure parts design at all loads of boiler.	Since the flue gas temperature at entry & exit of various boiler heating surfaces/ variation of the same across a cross-section perpendicular to gas flow are influenced by many operating parameters that could vary from those used for arriving at the average (Bulk) temperatures considered for design and since pressure parts design is on the basis of metal temperatures resulting from bulk fire side/ fluid side temperature / fluid mass flux etc., demonstration / guarantee of flue gas temperature at entry & exit of various boiler heating surfaces / variation fo the same across a cross-section perpendicular to gas flow, is practically not feasible. However this specification may please be deleted.	Bid specification prevail

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Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
220	8	1.4.39	For Balance of Plants, functional guarantees like capacities and parameters (except power consumption at individual system level) shall be demonstrated as per the specification furnished under respective sections forming part of this specification. Wherever applicable, Owner may, at his sole discretion, consider shop test result as primary indicators of the performance.	We request you to furnish the details on the guarantees required under this category to limit the extent of category III guarantees.	These have been covered under respective package specifications.
221	8	1.4.40	Utility Consumption Bidder shall have to indicate and demonstrate utility (e.g. DM Water, Clarified Water etc) consumptions.	Utility consumption is normally not guaranteed due to various reasons, including multitude points of consumption which are not under the control of the contractor. We request you therefore to delete this requirement from guarantee.	Bid Specification shall prevail
222	8	1.5.1	Steam Generator Efficiency: The steam generator efficiency (by loss method) shall be determined as per the requirements of BS EN 12952 - 15, 2003 (by loss method)	The boiler performance test shall be conducted in accordance with ASME PTC 4.	PTC 4 Confirmed
223		1.5.3	Performance/ Acceptance test for Steam Generator: The performance test shall be conducted in accordance with the latest version of ANSI PTC 4.0.....		

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**Pre - Bid Queries****Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
224		1.5.3	The measurement and computation of heat losses shall be carried out as per stipulations of ASME PTC 4.0		
225	8	1.5.7 (b)	Combined pressure drop in condenser tube, water box and inlet and outlet piping shall be measured in between intake and discharge point of the C.W. system with cleanliness factor of 0.9 and COLTCS in service.	It is not understood why pressure drop is included in the performance test for condenser. client to note that since the auxiliary power guarantee is already given by the Bidder and secondly since it is a full EPC project hence such performance testing of the condenser is not applicable.	Agreed
226	8	1.5.1	The steam generator efficiency (by loss method) shall be determined as per the requirements of BS EN 12952 - 15, 2003 (by loss method).	The boiler performance test code shall be ASME PTC 4. Please confirm.	PTC 4 Confirmed
227		1.5.3	The performance tests shall be conducted in accordance with the latest version of ANSI PTC 4.0.		
228		1.5.3	The measurement and computation of heat losses shall be carried out as per stipulations of ASME PTC 4.0.		

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
229	8	1.5.1 (a)	The steam generator efficiency (by loss method) shall be determined as per the requirements of BS EN 12952- 15, 2003 (by loss method) and other stipulations brought out hereunder.	Two different test codes are specified for Boiler performance test in the tender specification. Bidder shall carry out the performance test for boiler efficiency with ASME PTC 4 only.	PTC 4 Confirmed
	8	1.5.3	The performance tests shall be conducted in accordance with the latest version of ANSI PTC 4.0 except for the specific requirements brought out herein below.		
230	8	1.5.1 (b)	The guaranteed efficiency shall comply with following limiting parameters with design coal firing: (i) Excess air at economizer outlet at 100% TMCR load: 20% (minimum) (ii) Corrected flue gas temperature (at 100% TMCR load):135 Deg C or as predicted by the bidder at air preheater outlet.	Since the Boiler shall be designed with 15% excess air the boiler efficiency guarantee shall be furnished with 15% excess air. Please accept .	
231	Volume-II/ Section- 8	Cl .No 1.5.3	The efficiency tests shall be carried out with the steam generator operating at the guaranteed point condition i.e. corresponding to 100%, 75%, 60% TMCR, or at the agreed loads	Steam generator operating Guarantee point is 100% TMCR. Hence Performance/ Acceptance test for efficiency shall be carried out at Guarantee point i.e. 100% TMCR only. Please confirm.	
232	vol II, sec - 8, pg 183-555	1.5.4	Corrections shall be applied to the tested efficiency to correct it to the design conditions for variations in the following parameters only, - v) Moisture in Coal.	In addition to Moisture the PF fineness variation and HGI correction also shall be applied to arrive at the corrected mill capacity.	Agreed.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
233	8	1.5.5	ESP test	The test for ESP will also be carried out along with the plant performance test. Please review and confirm.	Bid specification prevail
234	Section – 8	1.5.5, Page 184 of 555	Outlet dust concentration of ESP with one field out in each stream while firing worst coal shall be 50 mg/Nm ³	We interpret that the ESP shall be designed for outlet dust concentration of 50mg/Nm ³ while firing 100%BMCR-WC with all fields in service and guaranteed for a dust concentration of 50mg/Nm ³ at 100% TMCR-WC firing condition with one field out of service i.e. in line with Cl:11.0 of datasheet-A. Kindly confirm.	Please refer Data sheet A, Vol IIIA , Section 2, Sl. No.11 (a)
235	Section – 8	1.5.5, Page 184 of 555	Outlet dust concentration of ESP with one field out in each stream while firing worst coal shall be 50 mg/Nm ³	ESP shall be designed for a dust concentration of 50mg/Nm ³ while firing 100%BMCR-WC with all fields in service and guaranteed for a dust concentration of 100% TMCR-WC firing condition with one field out of service i.e. in line with Cl:11.0 of datasheet-A	Please refer Data sheet A, Vol IIIA , Section 2, Sl. No.11 (a)
236	8	1.5.5	Performance / Acceptance Test for Electrostatic precipitator : The Performance Test for ESP will commence after a min. period of 3000 Hrs of continuous operation after completion of Trial Run.	Performance test for ESP will be carried out along with PG testing of the complete unit i.e. within 3 months from the date of 1st synchronisation.	Bid Spec prevails

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**Pre - Bid Queries****Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
237	8	1.5.6	Corrections to the test results for steam turbine shall be applied as per the correction curves provided. When the system is properly isolated for a performance test, the unaccounted leakages should not be more than 0.1% of the design throttle flow at that load. However, during the test, if it is found that the unaccounted for leakage is more than 0.1% of design throttle flow at that load, then heat rate will be increased by an amount equal to half the difference between actual unaccounted for leakage expressed as percentage of design throttle flow at that load and 0.1% (allowed by the code).	The unaccounted for leakages shall be limited to 0.3% of designed throttle flow. Bidder will provide a correction curve to correct measured heatrate Vs leakages. Leakages will be calculated based on the following formula. $m_{LS} = m_{FW} - m_{losses}$	Bid Spec prevails
238	8	1.5.7	Combined pressure drop in condenser tube, water box and inlet and outlet piping shall be measured in between intake and discharge point of the C.W. system with cleanliness factor of 0.9 and COLTCS in service.	Pressure drop across condensing plant shall have impact on auxiliary power consumption which is covered in Auxiliary power consumption guarantees and hence we request you to delete the requirement of separate guarantee on the pressure drop.	Agreed
239	9	2.1	The Bidder shall indicate and include in his scope of supply all the necessary start-up, commissioning and recommended spares in addition to mandatory spares as specified elsewhere in the specification	As per this clause, recommended spares to be included in the scope of supply, however at other clause it is mentioned to be quoted separately. Please clarify the scope of recommended spares.	Recommended spares to be quoted separately.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
240	Vol II, Sec 9	2.1.5	The bidder shall guarantee supply of spare parts, which will be made based on manufacturer's drawings on special order from owner for 30 years after commissioning of the plant.	During the first ten years of the plant operation, ALSTOM PAC commits itself to support the customer with spares and service. Beyond ten years, Spares and service can be offered "on request" basis through a separate dedicated maintenance contract.	Bid Specification shall prevail
241	Vol II, Sec 9	2.1.6	Warranty period of all kind of spares shall be six thousand (6000) hours of operation, except normal wear or eighteen months from the date of receipt at site, whichever is later.	Defect liability period shall be same as specified in GCC (Vol I, Section 2) clause no. 44.14. Please confirm.	Confirm. (This clause is deleted)
242	Section: 9	2.1.6 Page 194 of 555	Warranty period for all kinds of spares shall be 6000 hours, except normal wear or 18 months from the date of receipt at site, whichever is later.	Kindly note that the Warranty period for all kinds of spares shall be 6000 hours, except normal wear or 18 months from the date of receipt at site, whichever is earlier.	Volume 1 Section 2 Cl 44.1.4 shall prevail.
243	9	2.2	Recommended spares	Bidder's recommended spares are already included in the given specification Mandatory spares list. Hence, no additional recommended spares are envisaged. Please confirm bidder's understanding.	Bid Specification is self-explanatory.
244	9	2.4	Mandatory spares parts	Mandatory spares will be provided as per applicability of bidder's design.	Bid Specification shall prevail
245	Section: 9	2.4.2 Page 195 of 555	During finalisation of detailed engineering.... , then the owner/consultant shall revise the list for compliance by the contractor without any cost implication.	Owner is requested to finalise the spares list at this stage.	Bid Specification prevails

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
246	Vol- II Sect-9,	Annexure - A Page 197 of 555	Mandatory spares List (Mechanical)	We do not find list of mandatory spares for Mill Rejects Handling System in the mandatory spares list of tender technical specification. You may kindly consider inclusion of the same	Agreed ; list will be furnished to bidders.
247	9	PG 204 OF 556	Mandatory spares	We understand that where "sets" are specified, 1 set refers to requirements of one equipment; for example in case of ID fan bearings, 1 set refers to 1 set of bearings for 1 no. ID fan. Please confirm.	Specification is self explanatory.It means that bidder has to supply one set of mandetory spares for each equipment.
248	9	20 PG 244 OF 556	Mandatory spares for drain cooler	Client to note that the mandatory spares for the drain cooler are applicable only if an external drain cooler is offered otherwise the section is not applicable. Kindly confirm.	Specification is self-explanatory
249	9	23 PG 245 OF 556	Condenser Tubes - 10 %	Client to note that there is actually no requirement for providing 10% extra tubes separately for the condenser as the condenser is already designed at VWO, 1% MU heat load conditon and the plant will actually opearate at much lower heat load and hence even there is some tube leakage there will not be any effect on the turbine output at 100% TMCR guarantee case. Accordingly kindly delete the requirement.	Bid Specification shall prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
250	Section: 9 Volume: III-C	4.2.1 Page 259 of 555 4.9 Page 181 of 245	Complete set of Drive Gear Box unit Drive shall consist of hydraulic motor and power pack unit without any gear box.	Complete set of drive gear box unit is not applicable because the Slew drive is hydraulic motor and power pack unit without any gear box.	Will be evaluated after receipt of detailed scheme by bidder.
251	Section: 9 Volume: III-C	43.1 Page 259 of 555 5.9.15 Page 181 of 245	Complete set of Drive Gear Box unit The bucket wheel drive shall be through high torque low speed hydraulic motor without reduction gear unit.	Complete set of drive gear box unit is not applicable because the Bucket wheel drive is hydraulic motor unit without gear box.	Will be evaluated after receipt of detailed scheme by bidder.
252	Section: 9 Volume: III-C	43.2 Page 259 of 555 5.9.15 Page 181 of 245	Coupling Assembly The bucket wheel drive shall be through high torque low speed hydraulic motor without reduction gear unit.	Coupling assembly is not applicable because the Bucket wheel drive is hydraulic motor unit without gear box & fluid coupling.	Will be evaluated after receipt of detailed scheme by bidder.
253	Section: 9	5 page 263 of 555	Idlers: Belt width 1800 mm	Idlers for suitable belt width shall be provided as per quantity mentioned in tender specifications.	To be taken up during bid evaluation stage

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
254	Section: 9	8 page 263 of 555	Vibrating Grizzly Feeder	No Vibrating grizzly feeder is required in CHP. Please confirm.	To be taken up during bid evaluation stage
255	9	5.8.4 PG 268 OF 556	Mandatory Spares of Crusher	Please confirm whether list of spares given for crusher in tender specifications are for ring granulator type or impactor hammer reversible type since type of crusher is mentioned differently in tender specifications & mandatory spares list.	For Impactor .
256	9	PG267/270 OF 556	Mandatory speares - Vibrating Grizzly feeder and Rack & pinion gate.	Spares for the vibrating grizzly feeder, rack and pinion gate have been listed in the mandatory list which to be supplied by the bidder but same were not shown the flow diagram as well as in specifications. Please clarify the contradiction and furnish the revised mandatory list for CHP if so required.	Vibrating feeder is shown in the Process flow diagram PE-189-PF-226. Rack and pinion gate along with Rod gate is required below grizzly hopper for which spares shall be provided.
257	9	1.2.7 PG 298 OF 556	Travelling water screen bearings-1 set	please note that as per technical specification there is no travelling water screen envisaged, whereas the spare list indicates travelling water screen bearings. It appears the spares for trvelling water screen with bearings is indicated inadvertantly, hence may please be deleted Please clarify.	Not applicable

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
258	9	1.7-1.11 PG 319 OF 556	Complete valves assembly : 100% of each type, size and class	Please clarify whether one (1) spare valve or 10% of each type, size and class is to be supplied.100% seems to be a typographical error.	10 % of each type and size
259	Volume II Section-9	Pg No. 349 of 555 Pg No. 354 of 555	Sr. No. 1.0 :- EOT Crane Sr. No. 4.0 :- Miscellaneous EOT Crane & Hoist	Spares covered under sr. no. 4 are more elaborate and complete as compared to spares covered under sr. no. 1. Please check and confirm that the spares considered are adequate for sr. no. 1(EOT Crane).	Sl. No. 4 shall be followed.
260	9	1.3.10 PG 398 OF 556	Mandatory spares: Magneto optical disk (MOD) drive unit: 2 no.	Is this equivalent to a floppy drive. Owner / Consultant to note that floppy drives are not a standard part of the PC systems and its use is becoming obsolete. Please clarify the requirement.	It is not a floppy drive.It is high capacity storage device.
261	9	1.11 PG 400 OF 556	Mandatory Spares: PCs: 2 no's of each type & model.	Please clarify the requirement. Is it Computers (PC) or OWS?	It is OWS.
262	9	1.0 Annexure E.	SPECIAL TOOLS AND TACKLES FOR ELECTRICAL EQUIPMENTS	The offered generator will be delivered with special tools as per its standard and applicability. If any more items should be included - detail description is required of each item mentioned in Annexure E. bidder's request to elaborate following items: Cutter trolley, Inner trolley, Rail, Sheet , Half ring, Ring, Screw, Segment, Supporting ring. Please confirm acceptance of bidder's standard and proven practice.	Bid specification prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
263	9	G 443 OF 55	Tools & Tackles list	Maintenance Tools & tackles list is not specified in the tender specification. Please furnish the same	Being furnished
264	9	2.1.6	Warranty period of all kind of spares shall be six thousand (6000) hours of operation, except normal wear or eighteen months from the date of receipt at site, whichever is later.	Defect liability period shall be same as specified in GCC (Vol I, Section 2) clause no. 44.1.4. Please confirm.	Confirmed.
265	9	2.1.6	Warranty period for all kinds of spares shall be 6000 hours, except normal wear or 18 months from the date of receipt at site, whichever is later.	Kindly note that the Warranty period for all kinds of spares shall be 6000 hours, except normal wear or 18 months from the date of receipt at site, whichever is earlier.	Volume 1 Section 2 Cl 44.1.4 shall prevail.
266	9	GENERAL	Mandatory spares	For certain equipment, for example motors or instruments, the spares are specified under the equipment as well as under electrical section. We understand that whenever spares are specified under the equipment category it need not be repeated under the general category also. Please confirm.	Confirmed
267	Section 9	General	Spares list is in pdf format.	Kindly provide the whole list in editable (word) format.	Readable format has been provided to bidder
268				Please note that certain items mentioned in the mandatory spares list may not be applicable as the equipments are OEM specific. Instead equivalent quantity of OEM applicable items will be provided as spares.	List will be finalised during detailed engineering.

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
269	10	Ann-A	RW analysis	Please inform the turbidity + suspended solids to be considered for design of pretreatment plant.	Clariflocculator shall be designed considering TSS : ≤ 2000 ppm Centrifuge & Thickener shall be designed considering TSS : 1000 ppm
270	10	Annex C	Analysis of coal: Imported coal	Please provide the imported coal ultimate and proximate analysis (not the range) and Blended coal ultimate and proximate analysis (70% Indian coal: 30% Imported coal) along with ash analysis. Please understand that in the absence of imported coal analysis, it is difficult to conduct design and performance check. We have, however, assumed the same and arrived at the blended coal analysis. The same is also enclosed at sheet Vol II-Annex. You may please send your consent in order to proceed.	Being furnished
271		Annex C-Notes- 2	Annex C-Notes- 2		

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
272	10	Ann.C	Analysis of coal: Worst Coal F.C. - 25.50, Vol. matter - 21.56, Moisture - 12.00, Ash - 41.20, Total - 100.26 HHV = 3500 kcal /kg	The worst coal proximate analysis: 1. The sum total is 100.26, Kindly clarify. 2. Pl confirm the HHV 3500 kcal/kg is on ARB	
	10	Ann C	Boiler and auxiliaries shall also be suitable to operate continuously at Design / Rated parameters for 100 % BMCR condition for fuel of 30 : 70 ratio of IMPORTED : Indigenous Coal	3. Kindly provide the analysis of imported coal most likely to be fired on ARB basis including HGI in addition to the range of coal.	
273	10	Annexure - C	Coal Analysis for imported coal: Fixed Carbon --30-55 % Volatile matter -- 25-40% (ADB) Moisture -- 10% Max (ARB) Ash -- 8 - 14% max(ADB) HHV -- 5500 - 6500 (ARB) Kcal/kg	MahaGenco is requested to provide the value of the constituents of imported coal analysis (not the range) and Blended coal analysis (70% Indian coal:30% Imported coal) along with ash analysis. Also, all the constituents shall be indicated in ARB basis. However in the absence of imported coal exact element analysis, we have assumed the same and arrived the blended coal analysis. The same is also enclosed for your review and concurrence. Refer Annexure-1	
274	10	Annexure - C Note - 2	Boiler and Auxiliaries shall also be suitable to operate continuously at Design/ rated parameters for 100% BMCR condition for fuel of 30:70 ratio of imported: indigenous coal as specified		

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
275	11	1	For approval of any vendor ,other than as indicated in enclosed list,the bidder has to submit credentials for scrutiny and approval of MAHAGENCO.The contractor shall note that the equipment shall be in successful operation for similar duty condition and similar application for minimum one year from the date set for bid opening.the bidder shall note that it is the "sole discretion" of MAHAGENCO to approve the vendors.	Vendor credentials for critical items only shall be submitted. Desired evidence for all items in support of successful operation of one year being qualifying requirement shall be possible for predefined items only.	Bid specification prevail
276	11	1.5, 1.36 and 1.40	Approved makes of BFP, CEP and BFPDT	We are a regular manufacturer of BFP, BFPDT and CEP for 500 MW and 660 MW sets. We possess required manufacturing facilities and technology for manufacture of these equipments. Therefore, at S. No. 1.5, 1.36 and 1.40, for the suppliers of BFP, BFPDT and CEP (respectively), kindly include our name in the list of approved makes.	Bid specification prevail
277	Vol- II Sect-11, Page 495 of 555	36	Mill Reject Handling System.	Considering limited number of vendors, additional vendor M/s Melco India Pvt Ltd, an approved vendor is being proposed for consideration. Please confirm.	Bid specification prevail
278	11		Vendor list	Please suggest atleast three approved makes for the given below euipments: -Auger coal sampling unit -Split case bearings	Bid specification prevail

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 VOLUME-II					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	Resolution
279	Volume II	General		In case of conflict between Volume II requirements vis-a-vis detailed specifications given in Volume III to Volume VIII, we presume that the detailed specifications shall prevail. Please confirm.	Volume III to VIII shall prevail.
280	Volume-II	General - works related to ash pond	-	Ash pond bund (for Bottom ash lean slurry and HCSD) construction, levelling of ash pond area, pond excavation, compacting, lining of pond, service road, lighting are excluded from bidder's scope. Please confirm.	Refer Volume II Section 3 Cl 3 (Exclusion).
281	Volume-II/ Section - 11,		LIST OF APPROVED VENDORS	Additional vendor shall be added apart from the list given in the bid document. Additional vendors shall be approved if they meet the provenness criteria mentioned in Volume I, Section 3, page 309, Cl. No. 2.0. Acceptance is requested.	Specification is self-explanatory

BHUSAWALTHERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**PRE - BID QUERIES****Bid Specification No. DG/BSL U-6/2011/T-1 Volume-II Annex**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation		Bidder's Query / Stipulation		Resolutions
Bhusawal Coals:			Auxiliary Power Consumption: Total auxiliary power consumption of all auxiliaries (as listed below) at 660 MW load with Zero make up, 76mm of Hg back pressure and 100% unit load with respect to the guaranteed Auxiliary Consumption as per Schedule - 7.				
	Parameter	Unit	Design coal	Worst Coal	Coal Blend	Imp. Coal	Bidder shall refer reply revised
			(Indian)	(Indian)	70% DC + 30% Imp. C	(Not to be considered for boiler design)	
	Prox. Analysis						
	Total H2O	% W	10.8	12	10.6	10	
	Ash	% W	33.76	41.2	28	15	
	VM	% W	26.61	21.56	28	33	
	FC	% W	28.83	25.24	32.9	42	
	Ult. Analysis						

BHUSAWAL THERMAL POWER STATION 1 x 660 MW UNIT - 6 PROJECT**PRE - BID QUERIES****Bid Specification No. DG/BSL U-6/2011/T-1 Volume-II Annex**

Sr. No.	Section No.	Clause No.	Bid Specification Stipulation		Bidder's Query / Stipulation		Resolutions
	Total H ₂ O	% W	10.8	12	10.6	10	analysis of coal furnished in Corrigendum - II
	Ash	% W	33.76	41.2	28	15	
	C	% W	40.34	35.87	46	59	
	H	% W	2.61	2.66	3	4	
	S	% W	0.7	0.6	0.7	0.8	
	N	% W	0.97	0.72	1.2	1.8	
	O	% W	10.82	6.95	10.5	9.4	
	HHV	Kcal/kg	3731	3500	4300	5700	
	HGI		55	50	55	55	
Performance Guarantee: TMCR with DC							
Design / Selection: BMCR / TMCR with WC							
Boiler suitable to fire Coal Blend comprising 70% DC + 30% Imp. Coal.							
(Note: Coal Blend comprising 70% WC + 30% Imp. Coal would be less onerous)							

BHUSAWAL THERMAL POWER STATION 1X 660 MW UNIT - 6 PROJECT

RESPONSE TO PRE - BID QUERIES

Bid Specification No. DG/BSL U-6/2011/T-1

VOLUME - III A

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
1	1	1.12	Superheater & Reheater Outlet Steam temperature control range shall be Within ± 5 °C for all loads from 60 % to 100 % range BMCR	This requirement of control range is not inline with the requirement of Clause No. 4.0 of datasheet Page No. 85 of 223 which describes Boiler control range shall be 50% to 100% BMCR.	Clause No. 4.0, data sheet A prevails.
2	1	2.1	Primary fuel – 100 % coal (Indigenous coal / Indigenous blended with IMPORTED coal on 70:30%)	Kindly provide the value of the constituents of imported coal analysis (not the range) and Blended coal analysis (70% Indian coal:30% Imported coal) along with ash analysis. Also, all the constituents shall be indicated in ARB basis.	Representative analyses of Imported coal furnished; please refer Corrigendum - II
3		3.1	The steam generator and auxiliaries shall be designed for indigenous Worst coal and the coal to be considered for performance guarantee shall be Design Coal; However, the Owner intends to use IMPORTED coal blended with the DOMESTIC coal whenever the need arises. The boiler and auxiliaries shall be suitable for generation of 100% BMCR capacity with rated pressure and temperature for a fuel mix of 70:30 ratio between DOMESTIC (Indian) coal and IMPORTED coal.	However in the absence of imported coal exact element analysis, we have assumed the same and arrived the blended coal analysis. The same is also enclosed for your review and concurrence. Refer Annexure-1	

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
4	I	2.2.4	Steam generator structure, water circulation system, water-steam separator system with two or more separators and a storage vessel for collecting the separated water.	Alstom standard design is with two (2) nos. of Integral Separator cum Storage Tank for a 660 MW power plant capacity.	Bid Specification shall prevail
5		5.47	Minimum Two (2) steam separators along with a drain collection vessel at the evaporator outlet shall be provided.		
6	1	2.2.6	Two stage attemperation system for superheaters including 2 x 100% pneumatic control station.	Single stage De-SH shall be provided for superheater and single interstage De-SH shall be provided for Reheaters.	Bid Specification shall prevail
7	1	2.2.6	Two stage Attemperation system for superheaters including 2 x 100% pneumatic control stations. Each control valve shall have one motor operated upstream isolating valve and one manually operated downstream isolating valve. Quick acting block valve (Pneumatically operated) shall be provided on the common supply header for each attemperation control system. One non-return valve shall be provided on the spray water line near the spray point and one flow nozzle shall be provided on each spray water line downstream of the control station	Due to very high pressure we shall provide motor operated bulk valve on the common SH spray line as per ASME TDP-1 requirement for sure shut off.	Bid Specification shall prevail
	1	5.6.7	SH Spray system for attemperation consisting of valves, pipelines and accessories shall be adequately sized for the maximum requirement. Suitable IX solenoid operated pneumatic block valves shall be provided to close in the event of unit trip out to prevent any water leakage.....flow. Location of spray water tapping from the feed water system shall be selected by the Bidder.		

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
8	1	2.2.7	Emergency attemperation system for reheater in which arrangement of control stations shall be similar to that of Super Heater Control stations.	Single stage De-SH shall be provided for superheater and single interstage De-SH shall be provided for Reheaters.	Bid Specification shall prevail
9	1	2.2.8	Economiser sytem with connecting pipes headers etc with non return valves and motor operated valves with integral by pass.	In super critical boilers feed water isolation at economiser inlet is not provided to keep the feed piping design pressure at optimum value. Kindly clarify whether the isolation requirement is to be envisaged..	economiser inlet valve is not required
10	1	2.2.11	The primary and secondary steam coil air preheater(SCAPH) with condensate collection tanks, control valves	Since SCAPH in primary stream will not be in operation during oil firing /start -up, it is proposed to provide SCAPHfor secondary side only. Please confirm	Agreed.
11	1	2.2.11	Primary and secondary steam coil Preheater with condensate collecting tanks,control valves for supplying steam along with necessary controls	Since bidder has proposed to provide 2 nos of trisector RAPH , SCAPH is not required for Primary air.	Agreed.

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
12	1	2.2.12	Start-up drain and vent regulating valves and isolating valves shall ... at superheater and reheater outlets, lowest set pressure safety valves on the water separators shall be provided with silencers.	For once through supercritical boilers start-up vents are not envisaged since the boiler will be started with HP-LP bypass in operation. The vent valves provided will be used for air release purpose only during boiler filling. Hence motorised valves and silencers are not necessary.	Bid Specification shall prevail
	1	2.3.1.4	All vent pipes and safety valves escape pipes to a level of 1 meter above SG house roof.		
	1	2.3.2.5	Start-up drain and vent regulating valves with motor drives	As per the bidder standard the vent pipe shall be routed to the safe location.	
	1	2.3.2.6	Start-up drain and vent isolating valves with motor drives		
	1	2.3.2.8	All start-up vents, lowest set pressure spring loaded safety valves on Superheater outlet and Reheater outlet shall be provided with silencers.		
	1	5.25.2.3	The start-up vent lines shall be provided with one motorised isolating valve and one motorised regulating valve.		

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
13	1	2.2.12	Electromatic relief valves at superheater and reheater outlets, lowest set pressure safety valves on the water separators shall be provided with silencers.	Inline with ASME guidelines for once through boilers Electromatic relief valves are only provided on SH outlet and no requirement of ERV at RH outlet. Further the plant is equipped with HP-LP bypass system which controls the reheater pressure and hence ERV is not required at RH outlet functionally. However spring loaded safety valves shall be provided at RH inlet and outlet.	Shall be considered as per regulatory norms.
	1	2.3.2.7	Electromatic Relief Valves shall be provided on SH and RH outlet,	Also ERV at RH outlet is not mandatory as per IBR though IBR does not cover super critical boilers. In view of the above ERV in the RH outlet is not required both as per code and functional requirement.	
14	1	2.3.1.15	Provision of Auxiliary Steam for initial requirement from existing units (2x500MW) along with necessary piping, valves and fittings from auxiliary steam header of existing units (2x500 MW) is covered in Bidder's scope along with their drains, steam trapping equipment etc.	As per the Specification Clause, our understanding is that there is no provision of Auxiliary Boiler. Steam requirement for 660 MW unit shall be drawn from existing units. Under above circumstances, please note that supercritical unit require aux steam during start-up. Therefore please confirm the followings: - whether existing plant can feed the required aux. steam to this new supercritical unit of 660 MW @ approx. 70 tph, 16 bar, 250 degC - 660 MW unit can't start if aux. steam from existing plant is not available.	70 TPH steam @ 14 ata & 310 deg C is available at the TP.

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
15	1	2.3.1.7	Steam Generator fill lines from Boiler Fill Pumps discharge line near Steam Generator area (in the Compressor room) and from the discharge of Boiler Booster Pump inside station building during start ups.	Boiler filling will be done by boiler fill pumps located near DM water storage tanks and no separate filling line is envisaged from discharge of boiler booster pump (BFP booster pump).	Bid Specification shall prevail
16	1	2.3.2.2	Feed check valve and isolating valve with motor drive; the feed check valve location to be ahead of isolating valve in the direction of flow. Isolation valve & feed check valve at economiser inlet.	client to note that the feed check valve shall be located at the downstream of the HP heaters. However there is no requirement to provide an isolation valve at such location as per Bidder's standard & proven practice. It shall be further noted that as per IBR amendment dated March 12, 2007 to regulation 520, feed water discharge piping for feed water system without economizer inlet isolating valve can be designed. Kindly confirm the acceptance.	Isolation valve at economiser outlet may be deleted; rest of the scheme will be evaluated after receipt of detailed scheme by bidder.
17	1	2.3.2.10	MSSV	we understand that the bypass line referred here is small capacity bypass for equalising. Please confirm.	motorised regulating as well as isolation valve for charging shall be provided.

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
18	1	2.3.2.10	AC motor driven main steam stop valve with separate bypass line with one motor operated isolating and one regulating valve.	Some integral bypass valves will be provided for Large size gate valve, if necessary as per valve supplier recommendation. Basically, motor bypass valves are not provided.	
19	1 1	2.3.3 2.7	Thermal insulation for hot surfaces to limit the surface temperature to 60 deg C. ensure skin temperature of not more than 60°C with ambient temperature of 45°C and Steam Generator at 100% MCR.	The temperature differential between the surface temperature and ambient temperature should be 20 - 25 °C in order to have an optimum thickness with air velocity of 1 m/s.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
20	1	2.3.1.2	Drain collection headers and drain connections to the flash tank. Flash tank shall be provided with condensate collection tank with condensate Drain Transfer Pump to STG Condenser.	As per bidder standard drain is circulated from water separator drain tank to following	Will be evaluated after receipt of detailed scheme by bidder.
	1	2.3.1.8	Steam Generator draining facility from bottom ring header and other drains. Connection piping between steam separator and storage vessel, storage vessel to boiler flash tank, flash tank to drain collection tanks, drain collection tanks to condenser etc.	(1) To Economizer through BCP. This operation is normally used to recover the heat from the drainwater to the feed water with BCP. (2) Directly feed to condenser . Drain water shall be recovered to condenser directly through WDC valve during BCP not in operation or during swelling at start-up operation.	
	1	5.5.1	To facilitate start-up of the steam generator, an atmospheric flash tank	Hence drain collection tank along with condensate pump is not required. However	
	1	5.26	Boiler start-up Recirculation Pump and drain system with start-up drain re-circulation pumps shall be provided and the start up drains.....atmospheric flash tank, drain receiving tank, 2 X 50% condensate transfer pumps, valves etc.	Boiler flash tank is provided to receive other drains from boiler. From Boiler flash tank this drain shall be led by gravity to Boiler Blow Down pit. And from Boiler Blow Down pit this drain shall be pumped to CMB.	
21	1	2.3.5.9	Elevator	As there is only one boiler in the plant, please review requirement to have two elevators. We feel one elevator for the boiler would be adequate.	Bid Specification shall prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
22	1	2.3.5.12	Interconnecting platform shall also be provided between the steam generator and bunker buildings at three elevations.	Interconnecting platform between Boiler and station building shall be provided at one elevation. Preferably at feeder elevation as per our arrangement.	Bid Specification shall prevail
23	1	2.12	Gravimetric raw coal feeders with drives and raw coal chute to mills including suitable chute bypassing mill for emergency bunker evacuation.	Bidder shall provide belt type gravimetric coal feeder as it is proven for large size power plants and bidder has many reference plants with belt type feeders. Further the boiler layout has been standardised with belt type feeder and hence bidder request owner to accept belt type gravimetric feeder for this proposal.	Bid Specification shall prevail
	1	5.16.2	The coal pulverising and firing system shall consist of medium speed coal mills with drives, Gravimetric coal feeders with drives		
	1	5.16.3.2	Each coal mill shall be provided with a separate Gravimetric coal feeder.		
	1	5.16.27.1	Feeder type: gravimetric, all metallic rotary feeder,RC feeder for each mill		
24	1	2.13	Pulverisers and motors with handling devices: No. of pulverisers shall be N+2 as described in data sheet A	We propose One (1) mill as standby at 100% TMCR with worst coal.	Bid Specification shall prevail
25		5.16.3.1	Each coal mill shall be designed with 15% margin over coal mill flow at BMCR with worst/design coal whichever, as per specified design criteria works out maximum. Total number of mills shall be N+2 where N=6 (minimum) for 100%TGMCR operation with worst coal.		

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
26	1	2.13	Pulverisers and motors with handling devices. Number of Pulverisers shall be N+2 as described in Datasheet - A.	The number of mills shall be decided as per bidder standard based on the coal properties, boiler design parameters, mill size etc. Bidder propose the mill selection criteria as follows: N+2 at 100 % BMCR with design coal N+1at 100% BMCR with worst coal firing N= No. of operating mills, In line with the clause no 1.4.5 (b) maximum mill loading is considered as 90 % .	Bid Specification shall prevail
	1	Data sheet-A.	Number of pulverisers: N+2		
	1	Sr.No:14.2	Each coal mill shall be designed with 15% margin over coal mill flow at BMCR with worst / design coal whichever, as per specified design criteria works out maximum. Total number of mills shall be N+2 where N = 6 (minimum) for 100% TGMCR operation with worst coal.		
	1	5.16.3.1	Maximum loading of the mill with worst coal and design coal (for sizing which ever is higher) :85% at 100% BMCR		
	8	Sr.No:14.6	Capacity output shall also be demonstrated on four coal pulverisers (of Owner's choice) of Steam Generator, not less than the 90% of guaranteed value of (a) above, at 100% mill loading with the originally installed grinding elements in nearly worn-out condition or at the end of guaranteed wear life of grinding elements, whichever is earlier.		
27	1	2.23	Load carrying oil burner with a total capacity sufficient to produce up to 30% Boiler maximum continuous rating (BMCR).	The minimum stable load without fuel oil support shall be 40% of SGMCR load, with two adjacent mills in service and mill loading not less than 50%	Bid Specification shall prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
28		3.4	The design of Steam Generator shall be such as not to call for oil support for flame stabilisation above (30%) rated output while firing entire range of coal		
29		3.7	The Steam Generator and all interconnected piping shall be designed for full load operation as base load. However, plant and equipment shall be capable to operate continuously up to a reduced load of 30% BMCR with coal without oil support.		
30		2.2	Coal start -up fuel - LDO upto 10% BMCR, beyond 10% upto 30% HFO.		
31		2.3	Capacity of oil burners for load carrying - Upto 30% BMCR (Without Coal firing)		
32	1	2.23	Load carrying oil burner with a total capacity sufficient to produce up to 30% Boiler maximum continuous rating (BMCR).	LDO burners shall be designed for 10% BMCR of boiler heat output and the HFO burners shall be designed for 30% BMCR of boiler heat output basis.	2.23. Confirmed. 5.22.1.1 : Specification is self-explanatory
	1	5.22.1.1	The Oil Firing System shall include Heavy Oil System to be used up to 40% rated output for support to stabilize coal firing.		
33	1	2.5.1 (c) 13.8	Electrically operated guillotine type gas tight isolations: Before and after each regenerative air heater on both flue gas and air side Double multi louvre type isolation dampers shall be provided before and after each regenerative air heater on air side	Kindly confirm whether double multi louvre type isolation dampers can be provided on the gas side also from layout considerations.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
34	1 / 29	3.10	The Steam Generator and auxiliaries shall perform continuously within the specified noise limit 85 db at a distance of 1.0 M.	The noise level from non continuous operating valves (like PCV, WDC valve etc,) may exceed 90dBA The noise level for safety valves including ERV shall be limited to 115dBA with silencer. Noise level around Mill will be 90dBA.	85 dB at a distance of 1 m from equipment shall be for continuous operating equipment.
35	1	3.14	Steam Generator shall be capable to undertake forced cooling under emergency.	This point is not clear. Please elaborate. However furnace cooling can be done by using the fan during boiler shut process.	Bidder's understanding is correct.
36	1	3.2	The boiler and auxiliaries shall be suitable for generation of 100% BMCR capacity with rated pressure and temperature for a fuel mix of 70: 30 ratio between DOMESTIC (Indian) coal and IMPORTED coal.	The coal blending (70 % Domestic and 30% imported) shall be considered based by Heat basis. Please confirm.	Shall be on weight basis.
37	1	3.2	The Steam Generator shall be capable of starting and picking up load without HP-LP bypass system with whole range of specified coal.	Once-through steam generator requires high water quality and if the boiler start-up is done without HP/LP bypass large amount of make-up water will be injected and it is difficult to keep high water quality during start-up . Hence it is not recommended for boiler start-up without HP-LP bypass system in operation.	Agreed.

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
38	1	3.6	The Steam Generator shall be designed for continuous operation with all the High Pressure Feed Water Heaters out of service,.....temperature, under such conditions. However, during cold start-up, feed water temperature may go down to 110 Deg C and even less at the time of black start (i.e. in absence of auxiliary steam). The superheater and reheater temperature control system shall be designed to maintain the rated steam temperature with the HP heaters out of service from 60% BMCR to 100% BMCR.	The boiler is not designed for all HP heaters out condition as the feed water temperature will be very low under such condition which will reduce the mill drying capacity. However the boiler is designed with One train HP heater out of service @ 100 % TMCR output and the boiler can be operated at reduced load with all HP heaters out of service with rated steam temperature.	Bid Specification shall prevail
39	1	5.2.6	The furnace walls shall be either spiral wound and vertical tubes or vertical rifle tubes, as per the manufacturer's practice.	As per Vol II, Sec 3, cl. No. 1.1.1, furnace/evaporator shall be with vertical wall. Bidder's standard design for furnace is with both spiral wall (Lower furnace) and vertical wall (Upper furnace) tubes design. Please confirm the acceptance.	Vol IIIA Section 1, Cl 5.2.6 prevails.
40	1	5.2.9	Coal bunkers	The storage capacity of 16 hours for the bunkers is quite large and would result in a very large structure. For other similar projects capacity of 10 to 12 hours is being adopted. Kinldy review.	Bid Specification shall prevail
41	1	5.2.9	Sixteen (16) Hrs storage of coal in bunkers shall be considered for structural design.	Twelve (12) hrs storage of coal in bunkers is considered. Please confirm	

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project					
Pre - Bid Queries					
Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
42	1	5.4.9	The design pressure shall be at least 1.05 times the maximum operating pressure or highest set pressure of the spring loaded safety valve for full discharge, or as required by IBR/ international Codes, whichever is higher. The design temperature shall be at least 40°C above the maximum fluid temperature for convection zones and 50°C for radiant zones.....time. This margin shall be equal to at least 5% of the maximum operating pressure with evaporator tubing without scaling or actual expected increase in pressure drop in water wall/ evaporator section, whichever is higher.	Design pressure for once-through boiler is decided according to ASME regulation where the design pressure is lower than the safety valve set pressure. The design temperature for un-heated parts (not within gas path) will be 15-20 C above maximum fluid temperature as per IBR requirement, For heated zones the design temperature will be as per metal temperature calculation.	Shall be considered as per regulatory (IBR/ ASME) provisions.
	1	Data sheet-A. Sr.No:8.1	Steam water separator Design pressure:1.05 times of maximum continuous operating pressure or highest safety valve set pressure whichever is higher.		
	1	Data sheet-A. Sr.No:8.2	Design Steam temperature :+ 40°C (minimum).		
43	I	5.5.1	The condensate from the condensate collection tank shall then be transferred to the condenser by the provision of 2 X 100% condensate transfer pumps for minimizing the make- up water requirement	We propose to provide 2 X 50% condensate transfer pumps. Please confirm,	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
44	1	5.5.1	ATMOSPHERIC FLASH TANK : The condensate from the condensate collection tank shall then be transferred to the condenser by the provision of 2 X 100% condensate transfer pumps for minimizing the make-up water requirement.	2 X 100% condensate transfer pumps will be considered. Please confirm.	
45		5.26	START-UP RECIRCULATION AND DRAIN SYSTEM: The start up drains shall be routed to the main condenser in the TG area through necessary atmospheric flash tank, drain receiving tank, 2 X 50% condensate transfer pumps, valves etc.		
46	1	5.6.5	The superheater shall be of proven design, made of seamless tubes and shall be designed to maintain superheat steam temperatures at superheater outlet between 50% BMCR to 100% BMCR under all operating regimes.	As per Vol III-B, Section I, cl. No. 3.6 and 1.12, Super heater and rehaeter temperature control range is required as 60% BMCR to 100% BMCR. Whereas as per clause no 4.0, 5.8.1 and 5.6.5 same is requiried as 50% BMCR to 100% BMCR. We are considering that The superheat and reheat steam temperatures at SH and RH outlet shall be maintained at rated value from 60% BMCR to 100% BMCR rating. Please confirm	Clause 5.6.5 is correct.
47	1	5.6.5	The super heater shall be of proven design, made of seamless tubes and shall be designed to maintain superheat steam temperatures at superheater outlet between 50% BMCR to 100% BMCR under all operating regimes	Please clarify whether the required steam temperature control range has to be considered as 60% TMCR (control load) to 100% BMCR.	

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
48	1	5.6.5	The super heater shall be of proven design, made of seamless tubes ... superheater outlet between 50% BMCR to 100% BMCR under all operating regimes.	Superheater and Reheater outlet temperature shall be maintained at rated value from 60% BMCR load to 100% BMCR load.	
	1	5.6.6	Superheater outlet temperature shall be maintained at ... The steam Generator shall have minimum superheat attemperation flow during TMCR operation.	As per bidder standard spray flow SH is maintained at all loads. SH temperature control is achieved by water fuel ratio and further by spray. Further spray water for SH attemperation is taken from economiser outlet and hence overall heat rate is not affected.	
	1	5.7.2	The Reheater outlet steam temperature shall be maintained at specified value from 50% to 100% Boiler MeR....spray shall be provided for emergency control.		
	1	5.8.1	The outlet temperature of SH and RH shall be guaranteed ... out of operation and HP - LP bypass operation.		
	1	Data sheet- A. Sr.No:1.12	Superheater & Reheater Outlet Within Steam temperahre control range: $\pm 5^{\circ}\text{C}$ for all loads from 60 % to 100 % range BMCR		
	1	Data sheet- A. Sr.No:4	Boiler control range shall be 50% to 100% BMCR. Minimum load with separator running dry shall be 30 % BMCR.		
	1 / 179	1.4.36	Superheater and Reheater ...40% to 100% TMCR including conditions: HP Heaters out of operations, HP-LP Bypass operation.		
49	1	5.7.2	Primary reheat steam temperature control system shall utilise the tilting of burners.	Our offer envisages opposed wall firing with gas biasing dampers at economiser outlet in the divided backpass for Reheat steam temperature control.	MAHAGENCO will revert.

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
50		22.1.1	Arrangement of burners : Corner fire with Tilting arrangement		
51	1	5.8.1	The outlet temperature of SH and RH shall be guaranteed to be maintained within $\pm 5^{\circ}\text{C}$ of the rated temperature condition from 60% to 100% BMCR.....	Please clarify whether the required steam temperature control range has to be considered as 60% TMCR (control load) to 100% BMCR.	50% to 100 % BMCR
52	1	5.9.4	Provision of space shall be kept for at least 20% addition of additional economizer surfaces in future. This space provision shall be over and above the gap provided between two horizontal banks of heat exchanger for the purpose of maintenance. Structure/hanger design shall be suitable for loads due to these additional surfaces (filled with water) also.	As per bidder standard , no space for future installation of economizer heating surfaces is envisaged.	Bid Specification shall prevail
53	1 / 53 1 / 90	5.11.9 Data sheet-A. Sr.No:13.1	The Air Heater shall have peripheral duplicate A.c. drive to be able to run the air heater at the rated RPM in the event of failure of one of the Air Heater drives. Air Heater:Rotary Regenerative, Tri-sector type or Bisector Type. Each with two peripheral AC motor drive and one independent air motor drive along with one air receiver of minimum 10 minutes capacity.	As per OEM standard centrally mounted motor drive shall be provided.	Bid Specification shall prevail
54	1 / 56	5.12.4	Cross-connections with sufficient number of power operated dampers shall be provided such that, to the limits of their capacity, the Steam Generator may continue to operate safely following the loss of any one F.D. fan, I.D. fan or air heater (if applicable).	Cross-connection duct at FD and PA fan outlet shall not be provided due to layout constraints. However Cross connection shall be provided at ESP outlet for ID fans.	Bid Specification shall prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
55	1	5.12.16	Piezometer rings to measure fan inlet air for PA and FD fan shall be supplied.	The primary air measurements are provided at respective mill inlet and the secondary air for combustion is measured at hot air duct to burners from airheater outlet. Hence kindly clarify whether additional air flow measurement at fan suction is to be provided.	Not Required.
56	1	5.15.1	The Bidder shall furnish Soot Blowers for the Furnace, Superheaters, Reheaters, Economiser and Air Heater, complete with all piping and accessories, including valves, controls and control panels. Short retractable rotary wall blowers shall be provided for the Furnace; long fully retractable rotary soot blowers for Superheaters, Reheaters and Economizers and sweep action blowers shall be provided for the regenerative Air Heaters.	As per bidder standard, for low gas temperature zone (ex. Economizer), Semi retractable soot blowers will be applied which will clean the entire heating surface. For Airheater semi retractable type soot blower shall be provided as per OEM standard.	Bid Specification shall prevail

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Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
57	1	5.16.3.1	Each coal mill shall be designed with 15% margin over coal mill flow at BMCR with worst/ design coal whichever, as per specified design criteria works out maximum. Total number of mills shall be N+2 where N=6 (minimum for 100% TMCR operation with worst coal)	The coal mills shall be selected based on the following: a) Mills with Static classifier and Max. mill loading 90% . b) Total no of Mills - 7 c) At 100% BMCR with worst coal - No standby mills d) At 100% BMCR with Design coal -1 mill as standby e) At 100% TMCR with worst coal - 1 mill as standby f) At 100% TMCR with design coal - 1 as mill standby	Bid Specification shall prevail
58	I	5.16.3.1	Each mill shall be designed with 15 % margin over coal flow at BMCR Total no of mills N+2 where N = 6 minimum at 100 % TGMCR with worst coal	Considering the mill loading limited to 85 % capacity and each mill catering to 4 burners, the number of burners with 6 mills being 24 it is suggested that the maximum heat input to burner shall be 60 million.- please confirm.	Bid Specification shall prevail
59	1	5.16.4	The coal mills and bunker bays shall be arranged on the steam generator left and right sides.....	As per the bidder standard, the coal mills and bunkers will be provided at the Boiler front. Similar coal mill and Bunker layout arrangement has been accepted in various projects worldwide.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
60	1	5.16.5	Two coal isolation gates shall be provided at each bunker outlet....	Rod gates shall be provided at bunker outlet and a motor operated isolation gate shall be provided at coal feeder inlet.	Bid Specification shall prevail
	1	5.16.27.6	The guillotine gate of Rotary feeder (between bunker and feeder) shall be motor operated. The provision for manual operation shall also be kept.		
61	1	5.16.09	The classifier provided at the mill outlet for screening the pulverized coal shall be a dynamic classifier with provision to adjust the fines size to suit the combustion requirement.	Considering fuels to be fired in the boiler, OEM recommendation is to use static classifier for mills. Please confirm.	Bid Specification shall prevail
62	vol-III A, Sec-1,pg 65-223	5.16.9	The classifier provided at the mill outlet for screening the pulverised coal shall be a dynamic classifier with provision to adjust the fines size to suit the combustion requirment.	For fineness of 70% through 200 mesh and 98% through 50 mesh static classifier would meet the requirement. Hence dynamic classifier is not envisaged and not being provided.The blades of Static classifier can be manually adjusted to adjust the fines size to suit the combustion requirments.	Bid Specification shall prevail
63	vol-III A, Sec-1,pg 64-223	5.16.16	Classifiers of the pulveriser shall be adjustable with the mills on operation to permit fineness of the fuel to be maintained under any condition. Classifier wear parts shall be suitably lines with ceramin.	Pulverisers are provided with static classifiers which can be adjusted manually with the mills in operation to permit fineness of the fuel to be maintained under any condition. For large changes, the ring-roll setting or increase in spring compression etc. need to be carried out, taking shutdown on mill.The classifier blades/ vanes are made of suitable wear resistant material and hence, separate lining is not provided over them.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
64	vol-III A, Sec-1,pg 65-223	5.16.23	Bidder shall clearly describe in the proposal, the means provided to measure the coal level in the mill.	The offered Mills works on a different principle and hence, coal level measuring is not applicable for this type of Mill.	Bid Specification shall prevail
65	vol-III A, Sec-1,pg 65-223	5.16.24	Suitable device for coal flow distribution as required shall be provided by the bidder.	There are four discharge valves provided at Mill outlet for coal air flow distribution as required. Further distribution for Boiler requirement is taken care in pulverised coal pipes.	Bid Specification shall prevail
66	1	5.16.27.4 (a)	The feeder shall be of all metal construction. There shall be only one rotating part in the feeder to reduce wear & tear/maintenance and power consumption.	Since bidder proposes to provide the gravimetric type belt feeder, there are two rotating parts in the feeder. One is for belt drive and other is for clean out conveyor drive.	Bid Specification shall prevail
67	Vol IIIA, Sect-I Page 67 of 223	5.17.2	Two mill reject storage silowith worst coal & 24 Hrs stoorage capacity.	As per normal practice ,capacity of mill rejects storage silo is selected considering 1% of actual coal fired at 100 % BMCR with 16 Hrs storage capacity. Pl.confirm acceptance.	Bid Specification shall prevail
68	1 Pg No. 67 & 68 of 223	5.17.2, 5.17.6 (b),(C),(d)	Two Mill reject silos (one for each coal mill bay).....100% PLF with worst coal & 24 Hour storage capacity.	For Front Mill arrangement, one number of silo is required which will be sized for 12 hrs effective storage capacity. Please confirm.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
69	1 Pg No. 68 of 223 & Pg No. 69 of 223	5.17.6 (g) Volume III-C Crusher Datasheet-A Sr. No. 2.2	Maximum size of mill reject....(-) 40mm* In case bidder expects higher size....suitable capacity crusher shall be provided for bring down the size of rejects to (-)40mm.... Coal output size : 95% (-)20mm with fines not less than (-)3mm.	As per Crusher datasheet - A, Sr. No. 2.2, 95% of coal is (-) 20 size and 5% coal size is higher than 20mm. Also in pyrite hopper, provision is made to handle oversize mill rejects particles of more than 40 mm size through oversize reject chute, provided above grid. Hence, crusher may not be required for mill reject handling system. Please confirm.	Bid Specification shall prevail
70	Vol IIIA, Sect-I Page 68 of 223	5.17.6 i)	Inlet/ outlet** valves of mill reject discharge hopper - Pneumatically operated knife edge gate valve.	One (1) No. pneumatically operated isolation valve shall be provided at pyrite hopper inlet and 1 (no.) manual operated isolation valve at pyrite hopper outlet. Pneumatic operated valve has been envisaged at inlet of conveying vessel in line with earlier executed projects. In addition a Manual isolation valve at the outlet of pyrite hopper has been envisaged before the pneumatic vessel inlet valve which will remain open under normal operation. This valve shall be closed only in case of downstream equipment is to be attended. Please review and confirm.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
71	Vol IIIA, Sect-I Page 68 of 223	5.17.6 n)	Piping = MS IS:3589	Conveying / instrument Piping as required shall be provided as IS: 1239 heavy grade for pipe sizes up to 150NB. Please requested to confirm.	Bidder's undersatnding is correct; specification stands amended.
72	1	5.23.12	Expected wear life of ID fan components shall not be less than 25000 hours from the date of commissioning.	The expected wear life of the ID fan blade shall be achieved considering the dust burden of 150mg/Nm3.	Bid Specification shall prevail
73	Volume III A, Section - 1	Process Flow Diagram - Feedwater System / 5.25.2.4	MOV at the inlet of economiser	As per the IBR amendment Reg 520, boiler feed water discharge piping can be designed without economizer inlet valve for maximum sustainable pressure (not with shut off pressure) by providing suitable mechanical safety provisions.	Not Required..
74	1	5.25.2.5	Motor operated (M.O.) main steam stop valves shall be provided with M.O. bypass valve (integral) at SH outlet.	Some integral bypass valves will be provided for Large size gate valve, if necessary as per valve supplier recommendation. Basically, motor bypass valves are not provided.	motorised regulating as well as isolation valve for charging shall be provided.
75	1	5.25.2.7	Start-up vents, Super-heater and Re-heater safety valves shall be provided with silencers. The sizing of the Boiler Safety Relief valves 5 be as per IBR stipulation.	The sizing of the safety valve shall be in accordance with ASME guidelines. IBR does not state about the supercritical boiler safety valve selection.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
76	1	Volume-III A/5.25.1 5	Silencers for all the safety valves on Pressure Vessels, superheater and reheater separately shall be provided in order to minimise the noise nuisance when the valve lifts.	1. Silencers for all Safety valves are normally not provided and hence not being envisaged for this project e.g. Deaerator, HP & LP Heaters, GSC etc. Please confirm acceptance. These safety valves will be activated during commissioning stage/ plant start-up only for testing purposes. Safety valves popping during normal operation for such applications would be extremely rare and hence silencers are not provided.	Bid Specification shall prevail
77	I	5.26	Boiler start-up Recirculation Pump and Drain system with start- up drain re- circulation pumps shall be provided and the start up drain shall be routed to the main condenser in the TG area through necessary atmospheric flash tank, drain receiving tank, 2 X 50% condensate transfer pumps, valves etc.	We propose to provide 2 X 50% condensate transfer pumps. Please confirm,	Bid Specification shall prevail
78	1	5.26.1 c)	(c) The start-up drain water recirculation system along with pipes/valves/flash tanks, Condenser etc. shall be sized in such a way that Steam Generator start up is possible, even with start up recirculation pump out of service.	Considering the reliability of Boiler circulation pump and also the design requirement of starting the boiler through low load start up system without boiler circulation pump, we propose to adopt 1 x 100 % Boiler Circulation Pump. Please confirm acceptance.	
79		5.26.3	Boiler start-up drain recirculation pumps and their motors shall meet the following requirements: (a) Number of pump : 2 X 100% (sized for maximum flow)		

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
80	I	5.26.3	The design temperature shall be at least 40 deg.C above the maximum fluid temperature for convection zone and 50 C for radiant zone	Design temperature margin of 40 C is not applicable for economiser zone - pl confirm	Bid Specification shall prevail
81	1	5.26.3	a) 2 x 100% (sized for max flow). b) gland less zero-leakage type with overhung impeller. c) Submerge type with wet stator with water coolers. Motor for steam generator start-up recirculation pumps shall be a wet motor, specifically designed by the pump manufacturer.....	Bidder will provide one BCP sized for about 25%BMCR flow. As per bidder standard the boiler can be started even BCP is out of operation. Hence stand by BCP is not required and not provided.	Bid Specification shall prevail
	1	Data sheet- A. Sr.No:12	2 x 100% Boiler circulation pumps for initial start-up/ low load operation.		
82	1	5.27.1	Aux steam header	We understand Bidder can offer two aux steam headers (high temp and low temp) or single aux steam header design. Please confirm.	Spec is self explanatory
83	1	5.27.1	Auxiliary steam system shall consist of one (1) auxiliary pressure reducing station (APRS) and a desuperheater on the steam line tapped off from the main steam line.	The steam for the auxiliary steam system shall be tapped from CRH Steam instead of the main steam line. The tapping of steam from main steam line will result in loss of high temperature steam.	Bid Specification shall prevail
84	1	5.27.3	The interconnection between auxiliary steam systems of the adjacent unit shall also be provided with separate isolating valves on both the sides and with required steam trapping equipment.	Manual Isolating valves shall be provided on both ends of HT and LT Aux steam header for future unit connection. Please confirm	Will be evaluated after receipt of detailed scheme by bidder.

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
85	1	6.1	Maximum Design pressure : As per NFPA but shall not be less than ± 660 mm WC at 67 % yield strength.	Maximum Design pressure : As per NFPA but shall be within ± 660 mm WC at 67 % yield strength.	Bid Specification shall prevail
86	1	6.11	Power Supply System	Power supply distribution will be decided during detailed engineering. Please clarify whether CHP Switchgear is that of the existing plant or new plant. If existing switchgear is to be used, please furnish details.	Specification is self-explanatory
87	1	8.2	Design Temperature: Design Steam temperature + 40°C (minimum).	Design Temperature of Water Separator shall be as per standard supercritical boiler design practice	Bid Specification shall prevail
88	1	10.7	Tube and header materials: Design Metal Temperature: Upto & including 550° C :Alloy steel to ASME SA-335:P-11/ P-12/P-22/;ASME SA213:T-11/T-22/or equivalent Upto & including 600° C: Alloy steel ASME SA-335/P-91/ 92; SA213 T-91/92 or equivalent	Design Metal Temperature: Upto & including 550° C :Alloy steel to ASME SA-335:P-11/ P-12/P-22/;ASME SA213:T-11/T-12/T-22/or equivalent Upto & including 600° C: Alloy steel ASME SA-335/P-91/ 92; SA213 T-22/T-91/92 or equivalent, Austenitic stainless steel	Clause suitably amended; please refer Corrigendum- II
89	1	14.1	Pulverisers Type : Vertical Spindle, Bowl Mills.	Pulverisers Type can be : Vertical Spindle, Bowl Mills/ Vertical Spindle, Roll Wheel	Bid Specification shall prevail
90	1	14.6	Maximum loading of the mill with worst coal and design coal (for sizing which ever is higher) - 85% at 100% BMCR	Max. Mill loading of 90% at 100% BMCR with worst coal and design coal may please be accepted.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
91	Sec- 1	14.8	PULVERISERS Input coal size to pulveriser 20 mm and below with 15% excursion up to 35 mm.	As per Volume – IIIA , Section – 1, Cl. No. : 14.8, Input coal size can be only up to 20 mm, However 15% excursion upto 35 mm is accepted.	
92	1	14.8	Input coal size to pulveriser : 20 mm and below with 15% excursion up to 35 mm.	Maximum Coal particle size at inlet of coal mills can be 50mm depending on mill design.	Bid Specification shall prevail
93	vol III-A, sce- 1, pg -94 of 223	14.9	Expected Output coal size from pulveriser - 70% through 200 mesh (75 micron) and 99% through 50 mesh (300 micron)	Pulveriser offered are equipped with static classifier which will achieve 70% through 200 mesh and 98% through 50 mesh. This will not result in unburnt carbon loss and will meet the boiler requirements.	Bid Specification shall prevail
94	1	12	2 x 100 % boiler recirculation pumps for initial start up / low load operation	The circulation pump is required to be in operation only during start up. Even when the pump is not available the boiler can be started up. Kindly clarify the need for 2x 100 % recirculation pumps.. Normally for similar boilers one pump is provided.	Bid Specification shall prevail
95	1	20.4	Maximum speed :1000 rpm	FD Fan Maximum Speed : 1500 rpm	Bid Specification shall prevail
96	1	21.1	Flue gas velocity : Maximum 13 m/sec.	Flue gas velocity : Maximum 13 m/sec before ESP. After ESP 16 m/sec	Bid Specification shall prevail
97	1	22.1.1	Arrangement of burners : Corner fire with Tilting arrangement	Arrangement of burners : Corner fire with Tilting arrangement / Alternatively Front or Rear wall fired burners as per Boiler designer's standard practice.	MAHAGENCO will revert.

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
98	I	5.5(datasheet)	Maximum heat input per burner = 55 million	Considering the mill loading limited to 85 % capacity and each mill catering to 4 burners, the number of burners with 6 mills being 24 it is suggested that the maximum heat input to burner shall be 60 million.- please confirm.	Bid Specification shall prevail
99	1	data sheet A	Minimum load with separator running dry shall be 30% BMCR	Minimum once through load with separator running dry shall be 35% BMCR (i.e SGMCR).	Bid Specification shall prevail
100	1	data sheet A	Maximum loading of the mill with worst coal and design coal (for sizing which ever is higher) – 85% at 100% BMCR	Max. Mill loading shall be 90% at 100% BMCR with worst coal and design coal.	Bid Specification shall prevail
101	1	data sheet A	Expected output coal size from Pulveriser – 70% through 200 mesh (75 micron) and 99% through 50 mesh (300 microns)	The output fineness that we are proposing for mill selection is 70% through 200 mesh & 98% through 50 mesh. Please confirm.	Bid Specification shall prevail
102	1	Datasheet 1.12	Within ± 5 °C for all loads from 60 % to 100 % range BMCR	Please clarify whether the required steam temperature control range has to be considered as 60% TMCR (control load) to 100% BMCR.	Shall be 50 to 100 % BMCR
103	1	Data sheet-A. Sr.No:3	Boiler operation with H.P/L.P bypass: Boiler operation shall be capable of cold start-up without bypass. The plant shall be designed for modified sliding pressure operation. The Steam Generator and the auxiliaries shall operate continuously for a power supply frequency variation between 47.5 Hz and 51.5 Hz. In case of load rejection, Boiler firing rate shall be brought down to 60% BMCR.	As per our supercritical boiler design HP /LP bypass valve shall be in operation during cold start-up. Please confirm your acceptance	Agreed.

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
104	1	Datasheet 4.0	Boiler control range shall be 50% to 100% BMCR.	Please clarify whether the required steam temperature control range has to be considered as 60% TMCR (control load) to 100% BMCR.	Bid Specification shall prevail
105	1	Data sheet-A. Sr.No:6.2	Maximum gas velocity before gas flow changes direction:10 m/s	Maximum average gas velocity shall be 10 m/sec in upper furnace (before gas flow changes direction).	Bid Specification shall prevail
106	1	Data sheet-A. Sr.No:7.1	Excess Air at APH inlet : 20%	Bidder will design the boiler with 15% of excess air. Bidder's technology partner has lot of reference installations with 15 % excess air for large capacity boiler.. However the draft system shall be designed for 20 % excess air.	Bid Specification shall prevail
107	1	Data sheet-A. Sr.No:7.3	Unburnt Combustibles at Economiser outlet as % of Fly Ash to be considered for determining boiler efficiency : 1.5 %	Since bidder will provide the advance burner system the the unburnt Combustibles at Economiser outlet as fly Ash is less than 1.5% as specified in the tender specification. Hence bidder should determine the boiler efficiency considering the actual unburnt combustibles.	Bidder shall consider 1%.
108	1 1	Data sheet-A. Sr.No:10.1 Data sheet-A. Sr.No:11.2	Convection pass gas velocity: Max 10 m/s Economiser Gas velocity:Max 10 m/s	Maximum average gas velocity shall be 10 m/sec.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
109	1	Datasheet 10.5	RH temperature variation; By burner tilting with supplementry water spray	For boiler equipped with burners mounted on walls (non tilting type) ,temperature control methods other than burner tilting will be employed.	Bid Specification shall prevail
110	1	Datasheet 21.5	Duct plate; minimum thickness : 8mm for gas duct 6mm for air duct	Following Duct thickness is proposed. Gas duct : 7mm before ESP 6mm after ESP Air duct : 5mm Kindly confirm. This is adopted for other similar power stations in India.	Bid Specification shall prevail
111	1	Data sheet, Item 14.1	Coal mill	We understand that the vertical spindle, medium speed MPS type mills are also acceptable.	Bid Specification shall prevail
112	1	Data sheet Item 14.5	Mills- Wear life of grinding components	Please review the wear life requested for the grinding components. The value is very high for Indian coals.	Bid Specification shall prevail
113	1	Data sheet-A. Sr.No:14.10	Pulveriser Noise level : Not exceeding 85.0 DBA at a distance of 1.0M	Noise level around mill will be 90 dB(A) at a distance of 1.0 m.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
114	1	Data sheet-A. Sr.No:17.5	PA fan margins test block: Margins over theoretical calculated requirement at 100% BMCR with worst coal having highest moisture, considering 10% leakage in air heater.	Bidder understands theoretical air shall be calculated as follows 1. 100 % BMCR firing worst coal 2. Ambient temperature - 27 deg C and 60 % RH 3. AH leakage - Actual leakage Further the margin shall be applied over theoretical air arrived as above and with power supply frequency - 50 Hz shall be 1. Head - 30 % 2. Flow - 25 %	Bid Specification shall prevail
115	1	Data sheet-A. Sr.No:19.4	ID fan: Maximum Speed 600 rpm	The ID fan shall be selected with maximum speed of 750 rpm as per OEM standard. The no. of stages can be single or two.	Bid Specification shall prevail
116	1	Data sheet-A. Sr.No:19.5	ID fan capacity: (i) Excess air-20% over Stoichiometric air. (ii) Air heater air in-leakage - Primary air leakage 15% and Secondary air leakage 10%. (iii) Air in leakage- 1 % of ESP inlet gas flow and 2% through ducts	(ii) Since bidder will provide the trisector air heater in the proposed project the total airheater leakage (primary + secondary) is about 6%. Hence for the ID fan selection the total airheater leakage shall be considered instead of primary air and secondary air leakage separately. (iii) Since we ensure the air ingress through the duct is zero same shall be considered for ID fan sizing.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
117	1	Data sheet-A. Sr.No:20.6 (vi)	FD fan Margin(Test Block): (i) Head - 30% (Over theoretical Requirement) (ii) Capacity - 20% (Over theoretical equipment)	Bidder understands theoretical air shall be calculated as follows 1. 100 % BMCR firing design coal / worst coal 2. Ambient temperature - 27 deg C and 60 % RH 3. AH leakage - Actual leakage Further the margin shall be applied over theoretical air arrived as above and with power supply frequency - 50 Hz shall be 1. Head - 30 % 2. Flow - 20 %	Bid Specification shall prevail
118	1	Data sheet-A. Sr.No:21.1	Duct flue gas velocity: Maximum 13 m/ sec.	We propose to apply flue gas velocity as follows Boiler to ESP - 15 m/s ESP to chimney - 20 m/s	Bid Specification shall prevail
119	1	Data sheet-A. Sr.No:21.2	Duct Air velocity: Maximum 16 m/ sec.	We propose to apply air velocity as follows Cold air - 15-20 m/s Hot air - 20 m/s	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
120	1	Data sheet-A. Sr.No:21.5	(i) Minimum thickness - 8 mm in gas duct. (ii) Minimum thickness - 6 mm in air duct. (iii) Corrosion allowance of 1.5 mm shall be considered for stress calculation.	We propose to apply the duct thickness as follows: 1. Hot and Cold Air duct - 5 mm 2. Gas ducting - 6mm 3. Material - SA36 or equivalent 4. Corrosion allowance shall not be considered for stress calculation.	Bid Specification shall prevail
121	1	Datasheet :Note 6(page 106)	Mill turn down ratio shall normally be 4:1.	Mill turn down ratio shall be 2:1, as minimum 50% mill loading is recommended.	Bid Specification shall prevail
122	1	Data sheet Item 122.1.1	Burners	We understand that the wall fired burners (opposed wall firing) without tilting arrangement as per boiler manufacturer standard technology is also acceptable.	Bid Specification shall prevail
123	1	Note-1.0	BMCR capacity	Normally the BMCR of boiler is considered as 102% of the turbine VWO steam flow plus continuous steam requirement for auxiliary systems at that load. The specified capacity of 110% of TMCR appears high. Please review and confirm.	Bid Specification shall prevail
124	1	DATA SHEET-A NOTES: 1.0	Steam flow at 100% Boiler Maximum Continuous Rating (BMCR) shall be 110% of Turbine Maximum Continuous Rating (TMCR) flow.	As per CEA guideline, Steam flow at 100% Boiler Maximum Continuous Rating (BMCR) is 107% of Turbine Maximum Continuous Rating (TMCR) flow. Please clarify if CEA guideline is acceptable.	Bid Specification shall prevail

Bhusawal Thermal Power Station 1 x 660 MW Unit - 6 Project Pre - Bid Queries Bid Specification No. DG/BSL U-6/2011/T-1 Volume-III-A					
Sr. No.	Section No.	Clause No.	Bid Specification Stipulation	Bidder's Query / Stipulation	RESOLUTION
125	1	General	-	Mill Reject Handling System specification i.e. design criteria is not available. Please provide details for Mill reject handling system.	Please refer Corrigendum - I
126	1	General	Specification does not state requirement.	Oily water drain from pit in transfer pump house shall be transferred to near by oily water pit in dyke area of fuel oil storage tank of existing plant. Kindly Confirm.	Will be evaluated after receipt of detailed scheme by bidder.
127	1	General	Specification does not state requirement.	Since the return line temperature for HFO will be high, and consequently will raise the FO day tank temperature over a period of time, hence we propose HFO cooler in long recirculation line from Boiler to HFO day tank. This equipment is required for system safety. Please confirm.	The bidder shall consider as required for the system
128	1	Volume- IIIA/ Datasheet- A Note 1.0	Steam flow at 100% BMCR shall be 110% of TMCR flow.	Owner may kindly recheck this requirement since the boiler will be unnecessarily over sized. As generally followed, 100% BMCR can be 107% of TMCR flow, which would be adequate for the purpose.	Bid Specification shall prevail
129	1 Page 51 of 247	Corrigendum-1/		Amendment through corrigendum-1, Sr. No. 2 of Pg. No. 51 of 247 is contradictory with specification clause no. 5.17.6 (e) of Volume III-A of 1 % of mill capacity. Please note that mill capacity is selected with margin. Hence does not required extra margin of 125 % of mill reject generated as per mill capacity.	Bid Specification shall prevail