

M/S DELHI MSW SOLUTION LIMITED

(DIVISION OF RAMKY GROUP)

DELHI

1 X 24 MW MSW BASED POWER PLANT

ADDENDUM TO BID DOCUMENT

FOR

CIVIL PACKAGE

SEPTEMBER 2011

ENQUIRY NO.: 11196/IPP/002

PREPARED BY	CHECKED BY	APPROVED BY

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SECTION - 1

PREAMBLE TO SCHEDULE OF ITEMS FOR INCLUSION IN RATES

1.0 GENERAL

This preamble to the schedule of items is an integral part of the schedule and shall have as much force as though this is incorporated into the description of the items themselves.

Tenderer rate for any items of work in the schedule of items shall, unless otherwise stated, be held to include the cost of all materials, including wastages, conveyance and delivery, unloading, storing, fabrication, hoisting, all labour for finishing to required shape and size, tools and plants, power, fuel, consumables, all taxes royalties, other revenue expenses, temporary facilities like roads, drains etc., providing temporary storage facilities for cement, steel and other materials and their subsequent dismantling, scaffolding and other temporary works, setting out, fitting and fixing in position, site drainage, dewatering, offering samples for approval, cost of all tests, rectification of all defects, replacement of defective materials and work, interruptions to work required to accommodate the work of other agencies working on the site, continuation of work beyond working hour, in the night and holidays also if situation warrants so, site clearance on completion, maintenance work during the period of maintenance, bye-work necessary to complete any particular item of work as per specification and direction of the Engineer-in-charge, overheads, profits and other incidental charges.

- 1.1 Cement (Ordinary Portland Cement conforming to IS : 269-1989 and IS : 8112 – 1989 or Portland Pozzolana Cement conforming to IS : 1489 (Part – I) – 1991), fly ash conforming to grade – I of IS:3812-2003, reinforcement steel and structural steel (Plates and sections) required for the permanent work of the project will be supplied by the Tenderer. The Tenderer shall store these materials store this material at site of construction at his own cost.

Responsibility for insuring the quality of cement shall rest with Tenderer. If the Tenderer uses the cement without any check on quality which may result in poor quality concrete, the dismantling and redoing such defective structures shall be at Tenderer cost.

- 1.2 Good quality sand shall only be used in the project Contractor has to bring good quality sand from nearby area if good quality sand is not available locally. There will be outright rejection of any work executed with inferior quality of local sand. The Tenderer must take note of this and build up the rates of the corresponding items for using the good quality sand.

2.0 EARTH WORKS

The rate of the related items shall include, but not limited to the following :

3.1 General

- 3.1.1 Setting out works, profiles etc., with reference pillars and their removal after completion of work.
- 3.1.2 Taking levels and reference axes wherever necessary from reference lines and bench mark, both for the original ground levels as well as for the finished or as directed.
- 3.1.3 Unless otherwise specified site clearance such as clearing of shrubs, green brush wood, under – growth and small trees not exceeding 30 cm. in girth at one meter above ground including uprooting stacking the serviceable materials within 1 km lead and removal of all rubbish unserviceable materials up to 5 km lead.
- 3.1.4 Working in both dry, wet and foul condition.
- 3.1.5 No distinction of rate between the work done manually or mechanically.
- 3.1.6 Dewatering, wherever necessary.
- 3.1.7 Forming (or leaving) “Dead men” or “Tell – tales” borrow pits and their removal after measurements.

3.2 Site Levelling

- 3.2.1 The work shall include filling / back filling, leveling and compaction of the excavated earth. Payment shall be made for excavation only and no separate payment shall be made for filling / back filling except where earth is borrowed from elsewhere for site leveling works and will be paid separately.
- 3.2.2 Costs of all tests necessary and / or directed for the compaction of the filling / back filling of site leveling works.

3.3 Excavation

- 3.3.1 Planking and strutting to retain the excavated sides and to protect the adjoining structures and services including removing the same.
- 3.3.2 Dewatering of accumulated water from any source till completion of all work below ground level including provision of surface drains, catchments pits etc., wherever necessary.

- 3.3.3 Providing adequate protection for safety of labour, materials, adjoining property, services, structures and equipments and install barriers around the excavation area, foundation, trenches, pits and red lights during night time, engage night watchman for safety against risk or accident.
- 3.3.4 Stacking the excavated materials within the specified leads.
- 3.3.5 Forming (or leaving) suitable steps on the sides or / and providing adequate and stable side slopes in case of deep foundation or soft, loose or slushy soil and removal of steps after measurements.
- 3.3.6 Removing slips or falls in excavation.
- 3.3.7 Dressing and trimming to required level, profile and gradient.
- 3.3.8 Excavation to desired gradients in case of trenches.
- 3.3.9 Extra excavation beyond drawing / specification for necessary working space, for safety requirements and other allied works including back filling and compacting the same.
- 3.3.10 Removal of the surplus excavated earth, to the specified location as directed and leveling the same.
- 3.3.11 Filling with cement concrete (with stone aggregate) M5B and well rammed in position, all excavation taken down below the proper levels due to carelessness of the Tenderer.
- 3.3.12 Sprinkling of sand and water over final bed and ramming the same before laying soling and concrete.
- 3.4 Filling / Back Filling
 - 3.4.1 Filling / Back filling with excavated earth or from spoil heaps shall include the excavation / re-excavation from such sources, all / re – handling and removing un-wanted materials from the soil.
 - 3.4.2 Compacting, leveling, watering, trimming to levels, profiles and gradient as per drawing, specification and / or as directed.
 - 3.4.3 Cost of all tests, as specified and / or as directed for the filling / back filling works.

3.5 Technical clarification

- 3.5.1 Contractor has to identify suitable borrow pit outside the project limits. After getting the approval from OWNER/ CONSULTANT the contractor can bring the soil from borrow pit.
- 3.5.2 Location for disposal of surplus excavated materials will be decided at site during execution so as to avoid re-handling.
- 3.5.3 All kinds of soil shall mean ordinary, hard soil and soft / decomposed rock (including Late rite) as per classification of soil mentioned in the Tech. Specification excepting hard rock to be paid under separate item.

3.0 ANTITERMITE TREATMENT

The rate shall include, but not limited to the following :

- 4.1 Treatment of excavated foundations.
- 4.2 Treatment of back filling.
- 4.3 Treatment of plinth both on excavation and on filling.
- 4.4 Treatment around entry / exit of pipes.
- 4.5 Treatment of wood work in ground floor.
- 4.6 Service guarantee for 10 years including rectification of any defects, thereof, during guarantee period. 10 years guarantee bond will be signed jointly by the Tenderer and specialized firm.

4.0 CONCRETE (PLAIN AND REINFORCED)

The rate of the respective item shall also include, but not limited to the following as described hereinafter in different Sub –Heads.

5.1 Concrete

- 5.1.1 Setting out all works from reference axes and bench marks.
- 5.1.2 Cleaning, washing and screening of aggregates whenever necessary.
- 5.1.3 Dewatering of all foundations and areas during concreting.
- 5.1.4 Cement slurry / cement mortar slurry at construction joints and cold joints.
- 5.1.5 Provision of Building paper and bearing plaster at bearing of slabs resting over walls.

- 5.1.6 All the appropriate provisions as stipulated in the specification of concrete chapter for materials, Design Mix, Preparatory works / surface preparation for concreting, facilities for checking, batching, mixing, transportation, placing and compaction of concrete, requirements in special cases of concreting, appropriate finishes to exposed surface, curing by appropriate means, all types of testing including hydraulic testing for Reservoir, water tank etc., as directed.
- 5.1.7 Provision of construction joint (water bar excludes) and surface preparation of construction joint and cold joint, before placement of concrete.
- 5.1.8 Provision of chases, holes / openings as per drawing and grouting with cement mortar as directed.
- 5.1.9 Cleaning all anchor holes and keeping them, covered.
- 5.1.10 Protection of the structure / premises, foundations till final handing over and keeping the premises, basement, etc., dry.
- 5.1.11 The hacking or roughening the exposed surface to receive plaster or where it is to be joined with brick masonry wall.
- 5.1.12 Providing moulding, throating, drip course, etc., unless mentioned otherwise in Schedule of item.
- 5.2 Reinforcement
 - 5.2.1 Cleaning and protection of reinforcements and de-coiling and straightening of bars, if required.
 - 5.2.2 Provision of chairs, spacer bars, incidental welding, spacer blocks, binding wires, etc.,
- 5.3 Form Work**
 - 5.3.1 Setting out the form works as per drawing.
 - 5.3.2 Preparation of the design of the form work whenever necessary and providing the same.
 - 5.3.3 Provision of necessary staging and scaffolding, including all measures necessary for easy movement and inspection.
 - 5.3.4 Provision of splayed edges, notching, allowance for overlaps and passing at angles, battens, centering, strutting, propping, bolting, mailing, wedging, easing, striking and removal.

- 5.3.5 Cleaning the shuttering, preparation of the form work, surface sealing the joints, provision of chamfers, cambers and form of preparation for concreting, rectification of any faulty works all as specified and as directed.
- 5.3.6 Temporary opening in the forms for pouring concrete, if required, removing rubbish etc.,
- 5.3.7 Dressing with oil to prevent adhesion of concrete with shuttering and, raking or circular cutting.
- 5.3.8 Arrangement of M.S. dowel bars at the Junction of R.C.C. and brick work, dowel bars shall be paid under reinforcement items.

5.4 Embedded Parts

- 5.4.1 Cleaning the embedded parts including the fixtures before use.
- 5.4.2 Provision of all jigs – fixtures, templates etc which are not the integral parts of the embedded parts , but necessary for fixing the embedded parts in position including all necessary welding, tying plugging etc.,
- 5.4.3 Providing approved anti-corrosive paint on the exposed surface as directed.
- 5.4.4 Providing grease on the exposed portion of the anchor bolts and covering them by some approved means.
- 5.4.5 Protecting all embedded parts till the completion of the respective erection.

5.5 Pre-Cast Concrete

- 5.5.1 Provision of casting yard, and moulds.
- 5.5.2 All the provisions as stipulated in the specification of concrete chapter and special concrete chapter for materials, design mix, checking, batching, mixing, placement, compaction and curing of concrete, testing of concrete etc.,
- 5.5.3 Providing necessary moulds / shuttering and necessary surface finished after stripping off the same.
- 5.5.4 Transportation, handling, erection, filling the joints / holes with approved grouts, and provision of all necessary safety measures while handling and erection.
- 5.5.5 Setting in position in 1:2 cement mortar or as specified.

5.6 Grouting

- 5.6.1 Preparation of base surface as specified including dewatering wherever necessary.

- 5.6.2 Provision of necessary shuttering including necessary surface finish after stripping.
- 5.6.3 Curing by approved means.
- 5.6.4 Cleaning the pockets / holes before grouting.
- 5.7 Damp-Proof Course Concrete
 - 5.7.1 Preparation of base surface as specified including dewatering wherever necessary.
 - 5.7.2 Provision of shuttering including necessary surface finish after stripping.
 - 5.7.3 Curing by approved means.
 - 5.7.4 Provision of approved admixtures as per manufacturer's specification where such admixture is specifically mentioned.
- 5.8 Technical Clarification
 - 5.8.1 Coarse and fine aggregates should be as per specification.
 - 5.8.2 Owner / Consultant shall decide use of plasticizer.
 - 5.8.3 All laps, hooks, bends will be paid as per specification unauthorized laps, ties will not be paid, As per preamble to schedule of items" all incidental weldings are included. Tenderer should quote accordingly.
 - 5.8.4 Removal of shuttering should be as per specification (vide clause 4.22.9)

5.0 MASONRY

The rate of the respective items shall be for the complete finished work and shall also include, but not limited to the following bye works / activities all complete at all levels and locations and as per specification and as directed by the Engineer-in-charge.

- 6.1 Setting out the works as per drawings.
- 6.2 Dewatering during works in foundations and in some particular cases, if found necessary.
- 6.3 Provision of scaffolding, platform, ladder, etc. including all necessary safety measures and accessibility and removal of the same.
- 6.4 Necessary surface preparation of dissimilar materials for proper bonding with masonry works as specified and as directed.

- 6.5 Providing opening / holes for which no deduction is made in the measurement.
- 6.6 Extra provision necessary in ends of beams, joints, slabs and the like with necessary leveling.
- 6.7 Raking of joints, as the work proceeds.
- 6.8 Bedding for plates, lintels, corrugated sheets and the like with necessary leveling.
- 6.9 Extra provisions necessary for projection, string course, sills, jambs, soffits of openings.
- 6.10 Curing by appropriate means.
- 6.11 Provision of metal pins, dowels, cramps, etc., for stone veneering.
- 6.12 Provision of necessary form work, template and centering in case of arches.
- 6.13 Removal of unused materials, dirt, debris etc., and cleaning the above after completing the work in particular area, if required.
- 6.14 Provision for drainage holes and recesses for cement concrete blocks, to embed holdfasts for door, windows etc.,
- 6.15 Chases and holes for sanitary and other service viz, sanitary and electrical fittings hangers for pipes and cables support and for call bells, clamps for light and fans, etc., as shown in drawing or as directed.

6.0 PLASTERING AND FINISHING

The rate of the respective item shall be for the complete finished work and shall also include, but not limited to the following bye-works / activities all complete at all level and locations and as per specification and as directed by the Engineer-in-charge.

- 7.1 Preparation of surface to receive plaster / finish etc., cleaning of masonry / concrete surface of all dust, loose mortar dropping, traces of algae efflorescence and other foreign matter and roughening by wire brushing or hacking as may be required and raking out of joints where required.
- 7.2 Provision for scaffolding wherever required and removing the same.
- 7.3 Extra provision necessary to provide plastering / finishing in layers, when required.
- 7.4 All extra provisions necessary for plastering / surface finish in arises, bonds, bends, closing chases, rounded angles, drip courses, string courses, around openings / holes and around dissimilar materials like metallic / timber / asbestos.

- 7.5 Nominal sprinkling of the cement slurry on the surface for proper grip and satisfactory finishing of the plaster work, if required.
- 7.6 Providing richer mortar 1:3 in a width of 75 mm on either sides of arises of all doors and windows.
- 7.7 All provisions necessary to achieve levels and true profiles.
- 7.8 Curing by appropriate means.
- 7.9 Removal of unused materials, dirt and debris and cleaning of area thorough, after completion of the work in particular area, if required.

7.0 WHITE WASHING, COLOUR WASHING AND PAINTING

The rate of the respective items shall be for the complete finished work and shall also include, but not limited to, the following bye – works / activities at all levels and locations and complete in all respects as per specification and as directed by the Engineer-in-Charge.

- 8.1 Preparing the base surface including necessary rectification and treatment.
- 8.2 Provision of surface ladders, scaffolding etc., wherever necessary.
- 8.3 Provision of prime coat wherever applicable.
- 8.4 Curing by appropriate means wherever applicable.
- 8.5 Cleaning the splashes and dripping on floors, equipments, pipelines etc.,
- 8.6 Additional work to rectify the improper workmanship specially if final finish is not satisfactory.
- 8.7 Protection of painted surface during application and till final handing over.
- 8.8 Provision of brushes, abrasive papers, indigo (neel) and gum.

8.0 FLOORING, PAVING AND FACING

The rate shall include, but not limited to the following.

- 9.1 Preparation of the base / sub grade before laying the flooring.
- 9.2 Provision of the under course (where applicable) including the required surface preparation.

- 9.3 Provision of dividing strips wherever required.
- 9.4 Provision of necessary covers, chambers, edging, rounding, and the like in the junction of floors with dado / skirting / other vertical surfaces around the pipes / openings / ends and other types of like cases.
- 9.5 Provision of small channels, grooves and the like.
- 9.6 Curing by appropriate means.
- 9.7 Provision of backing in case of linoleum / rubber / PVC / or similar flooring.
- 9.8 Working in isolated areas.
- 9.9 Provision of grinding and polishing when specified.
- 9.10 Necessary rectification to damages.
- 9.11 Protecting the floor till final handing over and maintaining the same within the maintenance period.
- 9.12 Additional thickness, the thickness mentioned shall be finished and minimum.
- 9.13 Applying cement slurry on the sub-base / structural slab before flooring to have a proper grip.
- 9.14 Provision of necessary panels to prevent construction cracks.
- 9.15 Finishing the surface ribbed or chequered or laid to falls if so desired.
- 9.16 Flooring in discontinuous strips or areas to suit the needs.
- 9.17 Providing necessary slopes as desired and rectification wherever any flooring is anti-slope.
- 9.18 Providing nosing at plinths, sills and steps etc., of so desired.

9.0 WOOD WORKS

The rate shall include, but not limited to the following:

- 10.1 Frames and Scantlings
 - 10.1.1 Making necessary holes / openings in masonry / concrete for fixing and jamming the same with appropriate materials.

- 10.1.2 Provision of bituminous coatings or other anticorrosive paint coatings on the surface in contact with concrete / masonry.
- 10.1.3 Provision of rawl plugs. Screws, nails, pins, adhesives and the like, necessary for joinery and fixing.
- 10.1.4 Provision of temporary wooden bracings and their removal.
- 10.1.5 Provision of rebates, roundings and other type of curvings as per drawing.
- 10.2 Shutters
 - 10.2.1 Provision of necessary wooden cleats, wooden blocks, with necessary screws, nails, adhesives etc.,
 - 10.2.2 Provision for mouldings, rebates, roundings and other types of curvings as per drawings.
 - 10.2.3 Provision of all necessary nails, screws, washers, bolts, nuts, putties, adhesives, etc.,
- 10.3 General
 - 10.3.1 Provision of finishing as desired and directed by the Engineer-in-charge.
 - 10.3.2 Rectification of damages and / or replacement of defective / rejected works.
 - 10.3.3 Provision of protection till final handing over and maintaining the same within the maintenance period.

10.0 METAL DOORS, WINDOWS, VENTILATORS, ROLLING SHUTTERS

The rate shall include, but not limited to the following:

- 11.1 Making necessary holes / openings in masonry / concrete for fixing and jamming the same with approved materials.
- 11.2 Shop fitting, assembly and shop coat of primer.
- 11.3 Doors, windows, gates, rolling shutters, glazed doors and windows and other items which are measured in Sq.m shall include all the necessary frames, angles, plates, sheets, holdfasts or lugs, locking arrangements, handles, bolting devices on both sides, hinges, pivots, guide rails and guide channels (wherever applicable), roller (wherever applicable), hood (wherever applicable), rubber linings, gaskets and the similar other fixtures necessary for fixing and locking arrangements (locks shall be separately paid unless otherwise mentioned in particular schedule of items).

- 11.4 Steel doors, rolling grills, louvers, etc., which are measured in Kg. shall also include all the appropriate fittings and fixtures as mentioned in 11.3 and the whole thing shall be weighed as a single item for payment, unless otherwise stated.
- 11.5 Glazed doors / windows shall also include the glazing / glass panes, glazing beads, glazing clips, putty, gasket and the like,
- 11.6 Rectification of damages and / or replacement of defective / rejected works.
- 11.7 Provision of protective measures till final handing over and protection / maintenance of the same within the maintenance period. Protection of glass panes / glazing after final hand over shall be the responsibility of the Owner.
- 11.8 Keeping the entire steel work free from corrosion and scrapping off and cleaning the rust, if any.

11.0 **GLAZING (WHERE GLAZING PAID SEPARATELY AS IN THE CASE OF NORTH LIGHT GLAZING)**

The rate shall include, but not limited to the following:

- 12.1 Glazing beads, beads, glazing clips, putty and the like.
- 12.2 Glazing bars in the case of north light & roof glazing.
- 12.3 Rectification / replacement of defective works.
- 12.4 Protection of the work till final hand over.

12.0 WATER SUPPLY, DRAINAGE AND SANITATION

The rate shall include, but not limited to the following:

- 13.1 Excavation, shoring and timbering, back filling and consolidation for pipes laid underground. Earth work and refilling in the case of items of S.W gully chambers, manholes, drop connections, vent shafts, road gully chambers and inspection chambers.
- 13.2 Jointing, haunching, encasing in concrete where required for pipes laid underground, unless otherwise stated.
- 13.3 Making necessary holes / chases / openings in masonry / concrete / flooring / paving / facing for laying and installation of the pipe lines / fixtures / specials and making good of the same with the similar / approved materials.
- 13.4 Supporting with clips, buckets, clamps, supports, saddles and the like and concealing in the case of pipes laid over ground. Provision of rungs if required in man holes.

- 13.5 All required specials e.g. bends, tees, shoes, cowls plugs and the like, excluding valves unless otherwise mentioned in particular schedule of item.
- 13.6 Painting as described in the schedule of items specification.
- 13.7 Finishing to required shape, size and gradient.
- 13.8 Setting, fitting and fixing in position, straight cutting and waste, return of packings, threading.
- 13.9 Caulking joints with appropriate material.
- 13.10 Testing of pipelines and man holes where called for including provision of all testing equipments etc.,
- 13.11 Jamming of supports in wall in the case of wash basins, sink and the like.
- 13.12 Fixing wooden plugs, etc., in wall for installing wash basin, kitchen, sink, mirror, towel rail, toilet paper holder etc.,
- 13.13 Rectification of damages and / or replacement of defective / rejected works.
- 13.14 Provision of protecting the same till final handing over and maintaining in accepted condition within the service maintenance period.
- 13.15 The form work required for concrete and RCC provided in various items of this section such as bedding.
- 13.16 Rounding or bottoming of the trench bed to fit the lower part of the pipe and grips dug to take sockets, collars etc., is included in the rate for laying the pipes.
- 13.17 All jointing materials like cement, sand, hamp / Jute Yarn., Tarred gasket bitumastic compound and red lead etc.,

13.0 ROAD WORK

The rates of related items shall include, but not limited to the following.

- 14.1 Payment of earthwork in formation for road shall be made on the basis of pre-section and post-section measurement after due compaction as specified.
- 14.2 Ordinarily, only soil with maximum laboratory dry density (when tested as per IS:2720 – Part VII) not less than 1.44 gm/cc shall be employed for construction of road embankment. Engineer-in-charge may, at his discretion, relax this requirement depending on availability of materials and other relevant factors.

- 14.3 Unless otherwise specified cost of all bye works and associated works viz., setting out. Survey works, de-slushing, dewatering, training channels, blinding materials, etc., shall be deemed to have been covered in the quoted rates of items.
- 14.4 Ash carpeting shall be applied only in slushy area and as per direction of Engineer-in-Charge for soil stabilization.
- 14.5 Cleaning and clearing the surface of all grass, bushes, trees and other vegetation growth, rubbish and other decayed materials. De-rooting of bushes and trees to the full depth and filling and ramming the cavities thus formed unless otherwise specified so in schedule of items.
- 14.6 Formation of embankment in layers and consolidating the same, including stripping of existing ground.
- 14.7 Using power roller or hand roller as specified in schedule of item along with cost of fuel and other running and operational charges.
- 14.8 Stacking of road construction materials in proper stacks as directed.
- 14.9 Cleaning and clearing the soling cost of the road, of all caked mud, animal dung, etc., and rectification of defects in camber and grade by filling up depressions and pot holes with stone boulders. Rolling dry and wet so that bed is true to grade and camber.
- 14.10 Making two parallel mud walls 200 x 150 mm size along the outer edges of the soling coat, laid true and parallel having a distance between them equal to the width to be metalled and at other places also like road junctions and sharp curves if so required by the Engineer-in-charge.
- 14.11 Cleaning and clearing the water bound macadam surface of all caked mud, animal dung and high patches and subsequent cleaning by wire brush, chisel, pick axe or any other tools as directed by the Engineer-in-charge and finally with hard brooms and fanning with gunny bags so as to expose the edges of the stones to a depth of 6 mm without dislodging the interlock of the metals.
- 14.12 Repairing the pot holes, depressions, undulations, etc. in the macadam surface with chips or ballast pre-coated with tar / bitumen including a tack coat and rolling the surface to correct camber and grade.
- 14.13 Sprinkling water over macadam surface to damp it in case cold quality emulsion is to be used.

- 14.14 Providing required dia rope along the outer edges of the macadam surface, fixing in position with nails, spikes or any other approved device so as to maintain well defined edges of the black topping.
- 14.15 Cleaning and clearing 250 mm on either side of the black topping line and water sprinkling on it so as to prevent outside dust coming in contact with black topped work.
- 14.16 Providing and spreading sand over newly black topped surface if specified so in schedule of item / specification.

SECTION – 2

GENERAL DESCRIPTION OF SCOPE OF WORK

SECTION - 2

GENERAL DESCRIPTION OF SCOPE OF WORK

1.0 Turbo generator foundation

The Turbo generator Foundation is a cast-in-situ reinforced concrete Frame foundation which consists of top deck slab, beams, columns and base raft. The base raft shall be extended to a depth, which conforms to the allowable bearing pressure of the soil.

2.0 Static Equipment Foundations

All the static equipment foundations shall be constructed with cast-in-situ reinforced concrete. All foundations shall be extended to a depth, which conforms to the allowable bearing pressure of the soil.

3.0 Technical Building

This building accommodates **MSW tipping floor, Refuse pit, Crab Crane, Boiler, Station building**

Station building houses turbogenerator, all the auxiliaries of the turbogenerator, EOT crane, maintenance area, switchgears, control room, battery room, ventilation and air conditioning room, offices & toilets etc.

4.0 MSW tipping floor

MSW tipping floor will be in RCC and designed for the truck loads. Tipping floor will be supported by RCC frame work and shallow foundation will be adopted for this structure. Roll up shutter shall be electrically operated.

5.0 Refuse pit

Refuse pit will be designed as storage structure. Refuse pit will be partly underground (approximately 6.0m) and partly above the ground (approximately 7.0m). Refuse pit walls are designed for inside Waste material pressure and outside earth pressure. Base slab will be given proper slopes and drainage system for removal of collected leach ate. Walls and base slab shall be coated with Coal tar epoxy painting

6.0 Station building

The sub structure of the building will be Isolated / Raft foundations and superstructure with RCC frame work, with concrete cast in situ floor slabs and concrete cast in situ roof slab for the control room and other rooms other than the machine room. The roof will be pre-coated steel with curvature or “Proflex” make type sheeting directly resting on building walls. External walls will be 200mm thick concrete block and internal walls will be 100mm thick concrete block work as per functional requirement of the building. The building frame shall support the overhead EOT crane moving on gantries.

The control room, DCS room and battery charger room shall be fully air conditioned. Offices will be provided with window air conditioners as per the requirement. Lift will be provided in the office area for easy access. Staircases will be provided as per the requirement at suitable locations.

7.0 Non-Plant Buildings

Non-Plant Buildings like, Fuel shed, Pump house etc., will be of concrete shallow foundations and superstructure with reinforced concrete / Structural steel frame work, reinforced concrete cast in situ / curved metal sheeting roof. External walls shall be of 200mm thick concrete block masonry and internal walls will be of 100mm concrete block masonry depending upon the functional requirement of the buildings.

Exterior and interior walls, ceiling shall be plastered and painted with approved colour and brand. Doors and rolling shutters with steel frame and adequate windows / ventilators with anodised aluminium frame and fly mesh screens with 6 mm thick glass shall be provided.

Around the buildings a 1.0m wide smooth finished concrete walkway and necessary steps and ramps shall be provided. Beyond this 1.0m wide landscaping corridor in front of storm water drain & roads shall be provided where possible.

8.0 Transformer

Transformers, breakers etc. shall be supported on reinforced concrete (Grade of concrete at least M-20) pedestals and foundations. The foundations shall be extended to a depth which conforms to the allowable bearing pressure of the soil. Necessary embedments, guide rails shall be provided for installation and easy manoeuvrability of the transformers.

An oil drainage pit filled with broken stones shall be provided around each transformer from which oil shall be drained to a common tank (soak pit) and shall have capacity equal to 100% of the volume of the largest transformer.

Brick, blast / fire wall (if required) shall be provided to prevent the spread of fire or explosion from one transformer to another transformer. The height of the blast / fire wall shall be extended 0.5m above highest point of the transformer. The blast / fire walls will be provided on all three sides transformers.

Cable Trenches will be constructed as per the requirement and as described in cable trenches.

9.0 Auxiliary Cooling Tower

The FRP cooling Tower shall consist of Hot Dipped Galvanised (HDG) steel columns and RCC basin for water storage. The cooling tower basin shall have water proofing to avoid seepage of water. The minimum grade of concrete shall be M-25 for the super structure. Approach platforms shall be provided for approaching various levels of the cooling tower.

10.0 Cable / Pipe Trenches

Cable trench walls and base slab will be of cast in situ reinforced concrete (Grade of Concrete M-20) & HYSD reinforcement steel bars conforming to IS: 1786. Trenches shall be covered with precast RC cover slabs of standard design. Suitable slope in the longitudinal direction shall be provided and to be connected to nearby plant drainage

system. Necessary embedment and edge protection angles shall be provided as per functional requirements.

11.0 Pipe Racks

Pipe rack supporting structure will be of structural steel columns with interconnecting longitudinal & transverse beams, properly braced with vertical & horizontal bracings. All structural steel members will be painted suitably. Width and tier of the rack shall be as per the system requirements. Access ladders at suitable places will be provided.

The steel columns will be resting on RCC pedestals / footings (grade M-20). The analysis and design of structures and foundations will be done as per provisions those laid down in the IS codes.

12.0 Roads and Pavement

Any new roads proposed within the plant shall be either double lane RCC roads with 7.0m and 1.0m wide shoulders on either side of the roads or shall be single lane RCC roads with 4.0m and one meter wide shoulders on either side of the road. Roads geometry and construction shall be in accordance with Indian Road Congress (IRC) or equivalent. All the roads shall be designed to withstand the largest expected loads. Minimum longitudinal slope of the road shall be 1 in 200 where there are curbs on each side. Without curbs the roads may be laid flat. Slope from crown to edge should be 1 in 50 generally on straight stretches. Super elevation shall be provided on curves.

The sub grade shall be compacted to the levels, falls, widths and cambers as per the grade requirements. Sub base will be laid on a prepared sub grade. Base and final road surfacing shall be of concrete. Precast RC kerbs on both sides of road shall be provided. The rainwater shall be collected in road side gullies and let into the plant surface drainage system.

Paving areas shall be properly graded and compacted to required grade and slopes before providing the base layer. Reinforced concrete paving (grade M-15) shall be done in alternate panels not exceeding 3.0m x 3.0m in size. Construction joints shall be filled with sealing compound. Around equipment foundations / columns isolation joint shall be provided upto full depth of the pavement. Expansion joints shall be provided at a maximum spacing of 15.0m.

Top surface of the pavement shall be provided with adequate slopes as required for the surface drainage.

13.0 Ramp

Ramp shall be provided for the trucks to access the tipping floor at 7.00M elevation from the normal pavement level. Retaining walls to be provided along the edges of the Ramp, and between the RCC walls borrow pit soil will be filled according to the earth work specification .The vertical gradient of the ramp is limited to 1 in 15.

14.0 Cover shed for Tipping floor & Refuse pit

The tipping floor shall be covered with steel roof supported by RCC columns approximate height of the shed above tipping floor shall be 11.0M.

The refuse pit will also covered by steel shed. The height the shed will be 32.0M from the finished floor level. This shed will have a concrete column upto 18.0m and remaining height will be structural column. A crap crane will be running approximately at the height of 28.0M from FFL.

15.0 Surface Drainage

All the paved and unpaved areas shall be adequately drained. The surface drainage system shall be designed for surface washings and/or rain/fire water as the case may be.

Contaminated area surface drainage shall be collected and discharged through catch pits. The catch pits shall be of RCC construction and shall be covered with CI / MS gratings. Uncontaminated areas surface drainage shall be done through rectangular RCC drains to be connected to open storm water drains and emptied into catch pits. Care shall be taken not to contaminate the existing natural pond if any.

The catch pits, interconnecting pipes and rectangular / trapezoidal drains shall be sized for carrying the design discharge when running full. Adequate bottom slope shall be provided to maintain minimum velocity.

The paved areas shall be sloped towards the catch pits drains.

At the road and other crossings suitable pipe / open RC culverts shall be provided.

16.0 Plumbing And Sanitary System

Plumbing and sanitary system shall serve all toilets, showers, bathrooms, kitchens and laundry room. Wherever possible all discharge pipes shall be fully vented. The design, installation, testing and maintenance of all plumbing systems & sanitary appliances shall comply with latest Indian Standards.

Toilets shall have one eastern style water closet and one western style water closet. All piping shall be concealed.

Eastern type water closets shall be flush mounted with the adjoining floor sloping into them for positive drainage. Floor drains shall be designed in such a way that their traps are always filled with water to guard against odours as well as insect and rodent infiltration.

All wash basins shall be equipped with pop up drain stops. All sinks shall have water taps.

All urinals and water closets shall have automatic flush valves with sensors. The minimum acceptable mounting height of a shower head shall be 1.8m from the finished shower floor.

17.0 Sewerage Drainage System

The sewerage drainage system consists of connecting the sanitary waste disposal from different buildings to the Septic tank through necessary pipeline. All the pipes shall be of RCC material. Minimum size of pipe at a service connection shall be 100mm and the minimum size of pipe for sewers shall be 200mm. Minimum slope in service connections shall be 1 in 40 and in sewers 1 in 400. All sewers shall be located along with roadways or public open spaces. Manholes shall be provided at the head of each sewer, at all changes in slope, direction or pipe size or at junctions of sewers. The maximum distance between manholes shall be 50m.

18.0 Site Clearance

All the materials and equipment employed for construction purpose shall be taken away from the site. All the rubbish and unwanted plant material shall be cleared and dumped away from the site. All areas within and outside the site which have been used during the construction shall be cleared and the ground surface shall be left in a safe and aesthetically good condition.

19.0 Fencing / Compound Wall

The Compound walls may be required to be installed on the main road side leading to the factory. Fencing is required in the transformer / switch yard area. Necessary handrails may be required at locations where steps are provided to reach different levels since the plant is located at different levels, compound wall or fencing for height of 2.5 metres may have to be erected appropriately.

SECTION – 3
NON TENDERED ITEMS

SECTION – 3

M/S.DELHI MSW SOLUTIONS LIMITED				
2x600 MSW BASED POWER PLANT				
Schedule of Non-tendered items				
SL. NO	DESCRIPTION OF ITEMS	UNIT	UNIT RATE	REMARKS
I	EARTH WORK EXCAVATION:			
1	Excavation in all kinds of ordinary/hard soils (also soils intermixed with boulders and slushy soils) for foundations, footings, trenches, etc. including dewatering, shoring, strutting, disposal of excavated earth upto 50m lead and lift up to 2.5m.	Cum		
1a	Same as item 1 but in ordinary rock (blasting not required) Upto 50m lead & lift 1.5m depth	Cum		
1b	Same as item 1 but in hard rock (Controlled blasting).Upto 50m lead & lift 1.5m depth	Cum		

1c	Same as item 1 but in hard rock (requiring blasting).Upto 50m lead & lift 1.5m depth	Cum		
1d	Same as item 1 but in hard rock (by using Rock Splitter and jack hammer) Upto 50m lead & lift 1.5mdepth	Cum		
1e	Extra for every additional Lead of 500m or part thereof in Item1,1a,1b 1c,1d.	Cum		
1f	Extra for every additional Lift of 1.00m or part thereof in Item1,1a,1b 1c,1d.	Cum		
1g	only blasting-			
	i)0.60m depth hole with blasting	No		
	ii)0.90m depth hole with blasting	No		
	iii)1.20m depth hole with blasting	No		
1h	Drilling for pre-bored cast in situ piles, including mobilisation ,set up drilling rig, Drill in all type of soil, use of bentonite / casing pipe (retrieved) , take SPT at select depths and select the pile resting depth after ascertaining the N > 50 /as directed by engineer to stop boring, demobilize , handling and disposal of the displaced materials from the bored hole as per engineers instructions, dewatering at all times till completion of concreting -all complete (excluding rate for concrete and reinforcement and pile testing) For actual drilling done pro-rata rate will be applied			
	a) 300mm Dia up to 4.5m long	m		
	B) 300mm Dia up to 6.0m long	m		
	C) 300mm Dia up to 8.0m long	m		
	D) 500mm Dia up to 4.5m Long	m		
	E) 500mm Dia up to 6.0m Long	m		
	F) 500mm Dia up to 8.0m Long	m		
	G) 500mm Dia up to 10.0m Long	m		
	H) 500mm Dia up to 15m Long	m		
1i	Cement concrete of grade M25 using 20 mm down gauge granite aggregate for piles of all diameter and depths but up to 0.6m approx beyond pile cut off levels, slicing and removing the extra length 0.60m approx of the pile beyond the cut off, making good the reinforcement bars,(concreting of pile cap not included and is included under the concreting rates taken under "foundations footing and plinth beams "with other schedules of the bid.)	m ³		

1j	Conduct Pile Test as per relevant Indian Standards for compression ,tension and lateral load carrying capacity of the pile. Non-destructive testing shall be done and the Tested pile/ piles shall be re-used (hence no separate charges for drilling casting of test piles are payable). Selection of pile /piles shall be done by the client engineer. Testing charges to include for mobilisation , demobilisation of all plant /equipments / testing tools and accessories, experts, technician and labour ,submission of 3 copies of test report all included.	LS		
1k	Grading of site as per the reduced levels specified in the construction drawings by cutting or filling as detailed in the approved for construction drawings including degree of compaction specified .Rates inclusive of all plant and equipments, technicians, labour ,compaction testing charges including experts deployed throughout the completion of work for periodic testing of degree of compaction after specified rolling thickness, use of water required during rolling, all leads and lifts, preparation of the existing ground level to receive new earth and finishing of the final ground level as directed by client engineer. Approximate maximum level up to which filling may be required is 2m from existing ground level. If cutting is resorted it will be to a maximum of 1m. Rates to include for bringing in imported earth from test pits, identification and testing of specimen from test pits before being approved for use , etc all inclusive	Sqm		
II	BACK FILLING:			
a	Backfilling foundations/ trenches, plinth filling. Etc., with selected excavated materials are barrowed from outside and consolidating the backfill by watering and ramming in layers of 300 mm all lead and lift as per IS specification at all levels& locations or as directed by the engineer in charge.	Cum		
b	Extra for every additional Lead of 500m or part thereof in Item2a	Cum		
3	CARTING & SOLING			

a	Disposal of excavated material (earth/murum/sand/rocks/etc)with in or out of the factory premises up to a initial lead of 500m dumping and leveling the dumped soil and leveling the area from where the material is transported, complete at all levels& location as directed by engineer in charge	Cum		
b	Extra for every additional Lead of 500m or part thereof in Item 3a.	Cum		
c	Supplying and laying dry hard stone metal soling with hand packing including binding with stone chips, stone dust as directed with watering, compacting etc. complete at all levels& locations for following thickness.			
	(i) consolidated thickness 150mm	Sqm		
	(ii) consolidated thickness boulder soling 200mm	Sqm		
	(iii) consolidated thickness boulder soling 230mm &above	Cum		
d	Laying of soling with available stones were got from excavation including breaking into sizes etc. at all levels& locations			
	(i) consolidated thickness 150mm	Sqm		
	(ii) consolidated thickness boulder soling 200mm	Sqm		
	(iii) consolidated thickness boulder soling 230mm & above	Cum		
IV	ANTITERMITE TREATMENTS & DEWATERING ETC.			
4a	Supplying, spreading and laying of polythene sheet (20 micron thickness)as per IS 10889 below PCC for foundation / flooring work, including labour, material etc all complete at all levels& locations as per direction of Engineer in charge.	Sqm		
4b	Supplying, spreading and laying of polythene sheet (HDPE 150micron thickness) as per IS 10889 for raw water tank (earthen sloped type) including labour, material etc all complete at all levels& locations as per directed by Engineer in charge.	Sqm		
4c	Dewatering for work beyond the contract period, original or extended including furnishing of pumps and other accessories all complete, as directed by the Engineer in charge.	per hour		

4d	Anti-termite treatment in excavations, backfilling materials, sand filling areas at all levels& locations (make 100mm deep or above holes at every 300mm distance)as directed by engineer in in charge.	Sqm		
4e	Supplying and laying of Pit sand filling with approval of engineer - in -charge at all levels& locations.	Cum		
V	BLINDING CONCRETING:			
5a	Supplying and placing M10 Grade plain cement concrete with ratio (1:3:6) leveling coarse for foundations, pits, floor etc with 40 or 20 mm downgraded coarse aggregates at all levels & locations including shoring, strutting, shuttering as necessary curing etc.	Cum		
VI	REINFORCED CEMENT CONCRETING:			
6a	and placing M 20 Grade reinforced cement concrete with 20 mm downgraded coarse aggregates excluding shuttering, reinforcement but including dewatering, vibrating, curing, finishing, hydro test for water retaining structure without any leakages complete.			
	a)Cols./ Pedestals up to FFL	Cum		
	b) Slabs, columns, beams, staircase slabs/landings from FFL to 6m	Cum		
	c)Slabs, columns, beams, staircase slabs/landings from 6 to 12m	Cum		
	d)Slabs, columns, beams, staircase slabs/landings from 12m to 18m	Cum		
	e) Slabs, columns, beams, staircase slabs/landings from 18m to 24m	Cum		
	f) Rain water gutter slab, wall at height >21mto22.5	Cum		
	g) Grade slab at FFL & plinth protection slab including expansion joints	Cum		
	h) curved wall, slab, beam, hopper walls concrete with necessary scaffolding and supports at all levels.	Sqm		
	i) Supplying and applying of Torch shield membrane for water proofing in grizzly hopper walls and floor, raft, wall at all levels.	Sqm		
	j) Pressure Grouting by nozzle injection method of slabs, beams and R.C.C walls at all levels.	Sqm		
	k) Casting and fixing of pre -cast slab as per drgs at all levels.	Sqm		

	l) Supplying and fixing of thermocol sheets in expansion joint as per drawings. at all levels	Sqm		
	m) Extra rate for additional grade of M30 as same above item 6a to 6L	Cum		
	n) Extra rate for additional grade of M35 as same above item 6a to 6L	Cum		
	o) Cutting with making of holes or pockets in concrete required for services .Thickness not exceeding 25 cm including grouting the same in cement concrete 1:1:2 after position of service lines, bolts.			
	Holes or pockets up to and including 0.01 m ² in area	Sqm		
	Holes or pockets exceeding 0.01 but not exceeding 0.05 m ² in areas.	Sqm		
	p) supplying and mixing of water proof compound admixture for water retaining structures or as required purpose with approved make or as directed by Engineer in charge	lit		
VII	REINFORCEMENT:			
7a	Labour Charges for Detailing, Straightening, cutting, lapping, bending, cleaning, unloading and placing in position reinforcement bars at all locations and levels including binding with 16 gauge soft annealed wire/welding as required, providing cover blocks for reinforcement complete etc.	t		
VIII	FORMWORK:			
8a	Centering and shuttering including strutting propping etc., and removal of form for Footing, Lintels, Beams, Plinth beams, Columns, Pillars, Posts. Suspended floors, Roof Landing, Balcony, etc. complete as per specification.			
	i Foundation, footing, columns, pedestals and plinth beams up to FFL	Sqm		
	ii Slabs, columns, beams, staircase slabs/landings from FFL to 6m	Sqm		
	iii Slabs, columns, beams, staircase slabs/landings from 6 to 12m	Sqm		
	iv Slabs, columns, beams, staircase slabs/landings from 12m to 18m	Sqm		
	iv Slabs, columns, beams, staircase slabs/landings from 18m to 24m	Sqm		

	v Rain water gutter slab, wall at height 20m to 22.5m.	Sqm		
	vi) Grade slab at FFL & plinth protection slab	Sqm		
	vii) curved shuttering for wall, beam, slab, hoper slab using plywood or steel at all levels	Sqm		
	viii) Providing and fixing of pockets as per drg by thermocol or any other material at all levels.	No		
	ix) Fixing of Sleeves, bolts insert plates, corner angles as per drg including marking, welding with all necessary tools and tackles at all levels as directed by the Engineer in charge.	No		
	x) Providing and removing extra staging for beams and slabs, walls up to 3.0m height	Sqm		
	xi) Providing and removing extra staging for beams and slabs, walls for every additional 3.0m height	Sqm		
IX	MASONRY WORK:			
9a	Supplying and laying 230 /350mm thick fly ash brick masonry in cement mortar 1:5 using approved quality designation clause 10 bricks including scaffolding, curing, raking joints, etc. complete for walls, wall footings, etc as per specifications at all levels.			
	i) below ground level	Cum		
	ii) FFL to 6m height	Cum		
	iii) from 6m to 12m height	Cum		
	iv) from 12m to 18m height	Cum		
	v) from 18m to 24m height	Cum		
	vi) 115mm thick for the above same at all levels & locations	sqm		
	vii) Supplying and fixing of Wire mesh approved make in one or two layers at concrete & brick or hollow block or fly ash brick wall joint with packing of C.M.1:2 including curing at all levels & locations.	Rm		
	viii) Supplying and laying brick on edge surfacing with class designation 7.5 or best locally available quality of nominal dimensions including 12mm thick cushion of sand, excavation, disposal of surplus earth, spreading of earth, ramming, watering etc.	sqm		
X	GROUTING:			

10a	a) Grouting/pressure grouting below base plates of crane girders/stanchions/machineries, etc. including anchor bolt pockets/pipe sleeves at any location with cementitious grout of approved make including supply of all labour, tools, plant, shuttering, curing etc. complete.(Grouting material only will be supplied by us)			
	i) Grouting in CC 1:1 Using 6mm chips (one part of chips & one part of CONBEXTRA GP2) in pockets below base plate at all levels for machinery foundations including curing etc. complete.(Grouting material only will be supplied by us)	Cum		
	ii) Grouting in CC 1:1 Using 6mm chips (one part of chips & one part of CONBEXTRA GP1) in pockets below base plate at all levels for machinery foundations including curing etc. complete.(Grouting material only will be supplied by us)	Cum		
XI	PLASTERING:			
11a	Providing plain faced cement plaster finished smooth 12mm thick internally in cement mortar 1:4 for masonry work complete including curing etc.			
	From 0 -4 m height	sqm		
	From 4 -9 m height	sqm		
	From 9 -14.5 m height	sqm		
	From 14.5 -18 m height	sqm		
	From 18 - 23.95 m height	sqm		
11b	Providing and making 6mm x 10mm recessed Groove making in plaster wall at all concrete and masonry joints in all levels & locations as directed by the Engineer in charge.	Rm		
XII	PAINTING:			
12a	i) Supplying and applying two coats of Acrylic emulsion paint of approved brand and manufacture to give an even shade including 3mm thick plaster of Paris punning, one coat of solvent thinnable cement primer of approved shade & quality of Berger make complete as directed by engineer in charge.	sqm		

	ii) Supplying and applying 2 or more coats of acid/alkali resistant paint of approved brand and colour to floors, walls and ceiling including preparation of surface to receive paint, Supplying and applying primer etc all complete as per manufacturer specification	Sqm		
	iii) Two or more coats of fire resistant paint to withstand 2 hrs of fire as per approved grade and manufacture to give an even shade complete at all levels and as direction of engineer in charge. .	Sqm		
	iii) Two or more coats of black anti-corrosive bit mastic painting of approved brand and manufacture to give an even shade complete at all heights above or below ground level.	Sqm		
	iv) Supplying and applying readymade Epoxy Paint over areas other than steel structure with suitable pigments of approved shade at all levels as per specification at all levels and direction of engineer in charge. The epoxy paint shall be a two pack mater	Sqm		
	v) Supplying and applying plaster of Paris punning on walls including preparation of surface, staging, etc. to achieve a smooth even surface all complete at all levels as per specification and as directed by Engineer.	Sqm		
	vi) Supplying and applying two coat of white cement including preparation of surface, staging, etc. to achieve a smooth even surface all complete at all levels as per specification and as directed by Engineer.	Sqm		
	vii) Supplying and applying two coat of cement paint including preparation of surface, staging, etc. to achieve a smooth even surface all complete at all levels as per specification and as directed by Engineer.	Sqm		
	viii) Supplying and applying two coat of colour wash (snowcem) including preparation of surface, staging, etc. to achieve a smooth even surface all complete at all levels as per specification and as directed by Engineer.	Sqm		

	(i) Supplying and applying to interior surface 2 coats of oil bound distemper of approved manufacture, colour and shade over a coat of primer conforming to IS : 428 including preparation of surfaces, scaffolding, etc., complete.			
XIII	DOORS & WINDOWS:			
a	Aesthetic day light lengthy panels as existing at all levels	sqm		
b	Supplying and fixing fire proof steel door shutters minimum 4hrs fire rating(single or double shutter) including frame conforming to IS:3614(part-1 & part-2). Shutters shall be minimum 60mm thick flush design comprising of two outer sheets of 18 gauge steel sheets rigidly			
XIV	RCC FLOORING:			
a	Cement concrete flooring 150mm thickness finished with power trowelling corresponding to M-20 grade as per IS 456 equivalent to 1:1 1/2:3 prop nominal mix (Cement: fine aggregates: coarse aggregate) using 20mm size (SS5) graded machine crushed hard granite metal with all necessary groove cuttings and approved sealants as per IS-Code including vacuum dewatering.	sqm		
b	Supplying and laying 50mm thick granolithic flooring consisting of 38mm thick 1:1.5:3 concrete base with coarse aggregate of 10mm and down size and 12 mm thick top layer of crushed granite chips and cement, mixed with (1:1.5) one cement to 1.5 parts by volume of crushed granite chips 6mm maximum size including finishing mixed with floor hardener Fosroc make etc. complete. Unevenness more than 2mm in one square meter will not be accepted.			
c	Same as above with Kottaah stone tile of 25mm thick with mortar bed of 25mm thickness over the operating floor -size to suit the availability but larger sizes with less joints preferred at all levels	sqm		
d	a1)Same as above work (Kottaah stone will be supplied by us) at all levels	sqm		
XV	ROOF TREATMENT:			

21b	<p>Supplying and laying Roof water proofing treatment for buildings and structure shall be provided using high solid content liquid elastomeric water proofing membrane with separate wearing course as per ASTM C-898. Thickness of the membrane shall be 1.5mm. This treatment shall include application of polymerised mastic over the roof to achieve smooth surface and primer coat. Wearing course on top of the membrane shall consist of 25mm thick PCC (1:2:4), cast in panels of max. 1.2 M x 1.2 M size and reinforced with 0.56mm dia. galvanised chicken wire mesh and sealing of joints using sealing compound/elastomeric water proofing membrane. Pathways for handling materials and movement of personal shall be provided with 22mm thick chequered cement concrete tiles as per IS 13801 fixed as per IS-1443 with width of 100mm.</p>	sqm		
	<p>Supplying and laying 200mm x 200mm x20 thk machine pressed clay tiles set in line and pattern over a bed of lime sand mortar 1:2 (1part of lime : 2 parts of sand) and joints raked and pointed with CM 1:1 etc. all complete as specified and as directed at all levels</p>	sqm		
XVII	STRUCTURAL STEEL:			
	<p>i)Supplying of Structural steel galvanised cat ladder including, detailing, fabricating aligning and fixing as per supplier drawing and specification. including lugs and welding to access steel roof at all levels</p>	t		
	<p>ii)Same as above work (only Structural steel supplied by us) at all levels</p>	t		
	<p>Welding of reinforcement bars whenever required for overlaps etc fillet welds 8 mm size as per approved drawings/instructions of Engineer. Including Electrods etc., complete at all levels.</p>	Rm		
XVIII	FENCING:			

29	a)Supplying and fixing G.I. barbed wire in fencing including mild steel posts or pre cast posts, clips, anchors, one coat of red oxide zinc chromate primer and two coats of approved aluminum paint etc complete as per specification, drawing and as directed.	Sqm		
XIX	ANCHOR FASTENERS:			
b	Designing, Supplying and fixing of Heavy duty galvanized chemical anchor fasteners of Hilti/Equivalent make of dia. 12mm and appropriate length in concrete (minimum grade Sqm0) to take direct tension of minimum 1.0Mton including anchor fastener, material.	Nos		
c	Designing, Supplying and fixing of Heavy duty galvanized chemical anchor fasteners of Hilti/Equivalent make of dia. 16mm and appropriate length in concrete (minimum grade Sqm0) to take direct tension of minimum 1.6Mton including anchor fastener, materials	Nos		
XX	EXPANSION JOINT SEALANTS & BOARDS:			
31	Supplying and installation of 25mm thick vibration damping resist flex or approved equivalent pads around foundation of vibrating equipment and other locations as directed by the Engineer at all levels including cost of all materials labour equipment etc			
	a)Supplying and fixing '12mm thick pre-moulded joint filler board.	Sqm		
	b)Supplying and filling polysulphide base sealant as per IS 12118 for 12mm thick x 25mm depth expansion joint over pre-moulded board.	RM		
	c)Supplying and fixing '20mm thick pre-moulded joint filler board.	Sqm		
	d)Supplying and filling polysulphide base sealant as per IS 12118 for 20mm thick x 25mm depth expansion joint over pre-moulded board.	RM		
	e)Supplying and fixing 25 mm thick pre-moulded joint filler board.	Sqm		
	f)Supplying and filling polysulphide base sealant as per IS 12118 for 25mm thick x 25mm depth expansion joint over pre-moulded board.	RM		
XXI	DISMANTLING:			

32	a)Dismantling of steel structures at all levels including transporting and filling the debris as directed with in the site.	t		
	b)Dismantling of Brick masonry structures at all levels including transporting and filling the debris as directed with in the site.	Cum		
	c)Dismantling of concrete hollow block or fly ash brick structures at all levels including transporting and filling the debris as directed with in the site.	Cum		
	d)Dismantling of b.t roadl structures at all levels including transporting and filling the debris as directed with in the site.	Cum		
	e)Dismantling of R.C.C structures at all levels including transporting and filling the debris as directed with in the site.	Cum		
	f)Dismantling of P.C.C structures at all levels including transporting and filling the debris as directed with in the site.	Cum		
	g)Dismantling of soling structures at all levels including transporting and filling the debris as directed with in the site.	Cum		
	h)Dismantling of R.R MASONRY structures at all levels including transporting and filling the debris as directed with in the site.			
	WATER SUPPLY			
33	Supply and fixing to wall 600 x 450 mm best quality beveled edge mirror 5.5 mm thick of approved make and quality with 4 mm thick plain plywood backing with CP brass dome shaped screws and rubber buffers etc.. Complete all as per drawings and as directed.	No		
34	Supply and erection of concrete Hume pipes of grade 'A' with following dia and required specials jointed with cement mortar 1:1 mix including testing the laid pipes and joints to a head of 2.5m of water.			
	a) 300 mm	RM		
	b) 450 mm	RM		
	c) 600 mm	RM		
	d) 750 mm	RM		
	e) 900 mm	RM		
XXII	RR MASONRY & HOLLOW BLOCK MASONRY:			

35	Supplying and constructing the Coursed rubble stone masonry, in CM (1:6) prop: (cement; sand) using hard granite stones from approved quarry including cost and conveyance of all materials like cement, sand, water, Granite stones, bond stones etc., from approved quarry, to the site and including labour for cutting stones to required size and shape, mixing of cement mortar, construction, scaffolding charges, curing etc., complete for finished item of work			
	a)up to ground level	Cum		
	b)Above ground level walls and pillars with expansion joint up to 3.5m ht	Cum		
	c)Pointing 1:3 for the above -35b	Sqm		
	d)coping with plastering with broken glass or any type approved by in charge for the above-35b	Sqm		
36	Supplying and constructing the UnCoursed rubble stone masonry, in CM (1:6) prop: (cement; sand) using hard granite stones from approved quarry including cost and conveyance of all materials like cement, sand, water, Granite stones, bond stones etc., from approved quarry, to the site and including labour for cutting stones to required size and shape, mixing of cement mortar, construction, scaffolding charges, curing etc., complete for finished item of work.			
	a)up to ground level	Cum		
	b)Above ground level walls and pillars with expansion joint up to 3.5m ht	Cum		
	c)Pointing 1:3 for the same above -36b	Sqm		
	d)coping with plastering with broken glass or any type approved by incharge for the above-36b	Sqm		
37	a) Supplying and laying Hollow block masonry in cement mortar 1:4 using approved quality designation including scaffolding, curing, raking joints, etc.,as per specification of Concrete Hollow Blocks of type B grade whose density not less than 1000 kg/m ³ and not greater than 1500 kg/ m ³ with Minimum Average Compressive Strength of 2.0 N/mm ² as per IS 2185 (Part-I) – (Reprinted) 1998 shall be used at all levels and locations.			
	i)150mmthick	Sqm		

	ii)200mmthick	Sqm		
	b) Pointing 1:3 for the same above -37B-ai&aii.	Sqm		
	c) Fixing of "Y" or "L" angles with grouting of pockets at top of same above	No		
XXIII	ROOF SHEETING:			
38	Sheet Cladding			
	a)Fixing in position of free issued CCGI sheet or any type roofing sheet to the MS trusses/ all type of Purlins with given slope and level including cost of labour and consumables etc to complete	Sqm		
	b)Fixing in position of free issued CCGI sheet or any type cladding sheet to the MS trusses as cladding as per drg. with given slope and level including cost of labour and consumables etc to complete	Sqm		
39	Supplying and laying 2mm thick antistatic PVC floor of approved shade including all labour, material etc all complete as per drawing and as directed by Engineer in charge.	Sqm		
40	a)Grouting the Dowel rod (Rock Anchor) holes with neat cement slurry including cost of steel	Rm		
	b)supply and fixing of HILTI make M 8mm - 20mm dia Bolts including scaffolding, curing and all necessaries at all levels and as directed by engineer in charge.(Give dia & length wise rate)	No		
XXIV	SANITARY FITTINGS:			
41	a)Supply and fixing of Exhaust fan and as directed by Engineer in charge.	No		
	b)Supply and fixing of health fa set and as directed by Engineer in charge.	No		
	c)Supplying and fixing hand dryer and as directed by Engineer in charge..	No		
	d)Supply and apply of Japan Black paint for wooden doors, windows and ventilators.	Sqm		
	e)Supplying and laying of Stoneware pipe and as directed by Engineer in charge. .			
	i)150 mm diameter	Rm		
	ii)200 mm diameter	Rm		
	f)Supplying and fixing of 38mm wooden flush door fittings etc and as directed by Engineer in charge.			
	g)Door Stopper and Magnet	No		
	h)Door Closer	No		

	I)Door Latch	No		
	J)Door Lock	No		
42	a)Fixing roof extractor fan frame over the all type of purlins as per manufacturer's specification.	Sqm		
	b)Supply and fixing Glazed partitions with (min 15 micron) anodised alluminium frames all accessories and consumables.4mm Glass from	Sqm		
	c)1m height only PVC/neoprene gasket weight of glass not less than 10 kg/sqm, Frame thickness min 2.5mm	Sqm		
43	Controlled removal of South side gable end RCC Columns (except the end columns) and RCC beams at all levels above 9.0m including gable top beam and brick work from ground level up to gable top - (no chiseling will be allowed) and bringing down the cut blocks in stages using external crane, disposal of debris as directed by engineer the entire work done in a planned way without affecting running plant Cost of diverting the existing services included, cost of supply erection/removal of temporary supports to carry the load from roof etc included, cost of removal of sheets cutting the steel purlins etc., all included, cost of supply, erection and removal of temporary barricade and tarpaulin sheets to avoid dust included.	LS		
44	Supplying, fabricating and fixing rods(sag rods)/ bolts with machine turned threads, nuts, and anchoring plate for any structure-all dia -all heights	t		
45	Fixing roof extractor fan frame over the all type of purlins as per manufacturer's specification and as directed by Engineer in charge..	t		
46	Supply and fixing Glazed partitions with (min 15 micron) anodised alluminium frames all accessories and consumables.4mm Glass from 1m height only PVC/neoprene gasket weight of glass not less than 10 kg/sqm, Frame thickness min 2.5mm and as directed by Engineer in charge	Sqm		

47	Gypsum board partitions 2.4m height max,67mm min thickness with anodized alluminium (15micron min thickness) frames of 2.5mm min glass reinforced gypsum board as double skin each min 8.50 mm thickness finish including all accessories - stainless steel screws	Sqm		
48	Supplying and fixing wash hand basin conforming to IS : 2566 in white vitreous china ware with CI brackets painted with three coats of approved white enamel paint, 32mm CP brass trap with extension pipe up to CI waste pipe, CI wall flanges and 12mm dia CP			
	a. 630x450mm	Each		
49	Supplying and fixing Indian type water Closet "PARRY" or approved equivalent in vitreous Chinaware, 'P' or 'S' trap with or without vent with raised foot threads including 10 Lt capacity "SLIMLINE" flushing cistern with 32 mm GI flush pipe of appropriate	Each		
50	Supplying and fixing European type water Closet "PARRY" or approved equivalent in vitreous Chinaware, 'P' or 'S' trap with or without vent with plastic/Bakelite seat and cove, rubber buffer and CP hinge, 10 litres flushing cistern including 10 mm dia flex	Each		
51	Supplying and fixing Stainless Steel sink with drain board overall size 1150x510x180 mm deep of "SUHAG" make or approved equivalent with necessary CI brackets, CP waste, CP bottle trap of required size and 12mm dia CP swan neck heavy quality tap for cold	Each		
52	Supplying and fixing flat black urinal in white vitreous chinaware conforming to IS :2566 with automatic flushing cistern conforming to IS :2326 CP brass bottle trap with extension piece, CP spreader pipe 10mm lead connector with CP stop cock to flushing	Each		
53	Supplying and fixing toilet paper holder 200x100mm white vitreous chinaware recessed type "PARRY" make or approved equivalent.	Each		
54	Supplying and fixing towel rail as specified and as directed. Aluminum anodized with CP screws			
	i) 25mm dia x 750mm long	Each		

55	Supplying and fixing plain glass mirror of approved equivalent, fixed with CP dome head screws on plain AC sheet backing and aluminium channel covered around as a frame etc. all complete and as directed.			
	a. 600x450mm	Each		
56	Supplying and fixing CP soap dispenser with CP brackets and CP screws etc. all complete and as directed	Each		
57	Supplying and fixing recessed white vitreous china 125 soap tray fixed to wall and as directed	Each		
58	Supplying and fixing in position HDPE (SINTEX or equivalent) tank with mosquito proof cover and locking arrangements, including cutting holes (for inlet, outlet, cleaning and overflow) and making pipe connections with socket and jambs, nuts, brass valve w			
	a.3000 litres			
	b. 5000 litres	Each		
	c. 7500 litres			
	d) 15000 litres			
59	Supplying and fixing GI water pipes of B class (medium) conforming to IS : 1239 with necessary fitting such as bends, tees, elbows, nip[ple, plugs etc. allow for fixing with HB clamps to walls and in trenches, making good the wall, applying two coats of			
	a. 75 mm dia	RM		
	b. 25 mm dia	RM		
	c. 20 mm dia	RM		
60	Supplying and laying PVC pipes 6 kg/sqcm conforming to IS : 4985 including all fittings, laid in slope and on walls, complete with required excavation and backfilling for underground pipe and 100 mm thick PCC bedding mix (1:5:10) all complete as directed.			
	a. 75 mm dia	RM		
	b. 50 mm dia	RM		
	c. 20 mm dia	RM		
	d.100mm Dia	RM		
	e.150mm Dia			
61	Supplying and fixing heavy duty CI gullies with 25mm thick CI grating and connecting GI pipes in floor slab for drains etc. all complete as specified and as directed.			

	a. 100 mm dia	Each		
62	I Supplying and fixing 15mm brass tap of approved make complete with all accessories	Each		
	ii. Supplying and fixing 25mm gate valve of approved make complete with all accessories	Each		
	iii. Supplying and fixing 75mm butterfly C.I gate valve of approved make complete with all accessories	Each		
	iv. Supplying and fixing 50mm gate valve of approved make complete with all accessories			
	V Supplying and fixing 40mm gate valve of approved make complete with all accessories			
63	Constructing septic tank of size internally 1.5x3.3x1.8m liquid depth, free board of 600mm above liquid level including necessary earthwork excavation laying PCC 1:3:6, 200mm thick, brick masonry 450mm wide up to 450mm, 345mm and 230mm to remaining height	Each		
64	Supplying and fixing of Water Stopper (all types) as per IS specification and approved by Engineer in charge.	Rm		
65	Supplying and fixing approved make chain/gear operated steel rolling shutters conforming to IS: 6248 to sizes and type as indicated on drawings, fabricated out of 18G thick MS interlocking laths, channel guides, helical coil springs, brackets, hood cover I	sqm		
66	Supplying Asbestos Cement Corrugated Sheet 6 mm thick roofing approved quality and make including necessary fixing accessories like GI hooks ,crank bolts, seam bolts, bituminous washers and two coats white wash. IS code 730-459-3007 are applicable	sqm		
67	Laying of Vacuum dewatering Flooring including groove making with sealant as per IS specification or as directed by in charge excluding concrete	sqm		
XXVI	ROAD WORKS:(if needed)			

68	Supplying and laying Water bound macadam for a consolidated thickness of 75 mm tk. over Sub base coarse using binder course comprising of 40mm aggregates, fine aggregates, fillers and as per standard .specifications	sqm		
69	Supplying and fixing of 25mm thick shalitek board in the expansion joints of road concreting including cutting to required shapes and sizes ,fixing in position, etc complete all as per specifications and as directed .	sqm		
70	Supplying and laying Bituminous concrete for a consolidated thickness of 50 mm over WBM surface using base and binder course comprising of aggregates, fine aggregates, fillers and bitumen as specifications conforming to IS.	sqm		
71	Supplying and laying Premix seal coat 25 mm thick comprising of thin application of fine aggregates premixed with bituminous binder after cleaning and brushing road and applying Tack coat (@0.3Kg/Sqm) if it is delayed by more than 24 hours after laying.	sqm		
72	Supplying, Precasting and fixing in position M20 grade Precast kerbs of length 600mm each in straight road and 300mm to 150mm in curvature as per drawings and architectural details with approved samples. Rate to include all leads and lifts, necessary excavation, backfilling ,shuttering, moulds , 100 mm thick PCC 1:3:6 mix concrete(one part of cement, three parts of sand six parts of metal) for fixing (as per drawing) fixing to line and plumb, raking and flush pointing the joints with cement mortar 1:3(1cement:3sand), curing ,making provision for pipe sleeves etc , complete all as per drawing (The reinforcement will be measured and paid separately under regular reinforcement item)	Rm		

73	Supplying and making provision near expansion joint of concrete slab ,road by inserting 32mm dia PVC pipe of medium quality ,all around the 25mm dia tor steel rod left as dowels, during concreting etc all as shown in standard expansion detail drg . .	Rm		
74	Precast cement paver block using 10 mm and less broken stone jelly for 60mm thickness including the cost of sand filling, fabrication, machine pressed precasting, moulding, curing, leading , lifting and laying,& fixing in position, including at all leads & lifts	sqm		
XXV	MISCELLANEOUS:			
75	Supply of man power			
a	Skilled labour-(mason, carpenter, bar bender, electrician, welder, fitter, mechanic)	No		
b	Semi skilled labour (man mazdoor, all type of helper)	No		
c	Un skilled labour(women mazdoor, helper)	No		
76	Supply of machinery (if needed)			
	i)Hire charges for road roller 10 tonne capacity including all fuel, service& manpower charges.	month		
	ii)Hire charges for road roller-Bhoomac-(Vibrating compaction)including all fuel, service& manpower charges.	month		
	iii)Hire charges for jcb or jd 315 excavator including all fuel, service& manpower charges.	per hour		
	iv) Hire charges for Excavator-200 including all fuel, service& manpower charges.	per hour		
	iv) Hire charges for Excavator-300 including all fuel, service & manpower charges.	per hour		
	iv) Hire charges for Rock breakar-200 including all fuel, service& manpower charges.	per hour		
	v) Hire charges for Chain Dozer including all fuel, service& manpower charges.	per hour		
	vi) Hire charges for Tractor Dozer including all fuel, service& manpower charges.	per hour		
	vii)Hire charges for lorry tipper including all fuel, service& manpower charges.	per hour/month		

	vii) Hire charges for tractor-tipper including all fuel, service & manpower charges.	per hour/month		
	viii) Hire charges for 5-hp dewater pump including all fuel, service & manpower charges.	per hour/month		
	ix) Hire charges for 62.5 kv generator including all fuel, service & manpower charges.	per hour		
	ix) Hire charges for 33 kv generator including all fuel, service & manpower charges.	per hour		
	x) Hire charges for rock jack hammer including all fuel, service & manpower charges.	per hour		