

**Progress of activities - Closure and containment works of MSW Kadapa**

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
<b>Part 1 - Site preparation including establishing of sorting area, temporary facilities, Demolition of Existing Works and Site Mobilization</b>						
101	Demolition of existing Brick Masonary compound wall manually / by mechanical means having height of 1.80 m (above ground) and depth ~ 2 m below ground level including foundations, loading, unloading and transport of demolished materials to the sorting and segregation area for crushing and reuse for temporary road and as fill materials, within a lead of 1 km, transportation to the temporary storage before reuse or final disposal, stacking of serviceable demolition waste materials and disposal of un-serviceable materials (MSW) back on the dump site including all materials, labour and manpower, equipments required for demolition of masonry / RCC Work, excavation and dewatering of trenches etc complete as directed by Engineer in charge and to the satisfaction of engineer in charge.	1100	Rmt	1080	-	Activity completed.
102	Demolition of former pump house located on road side within the compound wall of the dumpsite area of ~ 30 sq. m area, perimeter of 22 m with a height of 2.50 m (above ground), and depth of 2.0 m (below ground - foundation) including foundations, loading, unloading and transport of demolished materials to the sorting and segregation area for crushing and reuse for temporary road and as fill materials, within a lead of 1 km, transportation to the temporary storage before reuse or final disposal, stacking of serviceable demolition waste materials and disposal of un-serviceable materials (MSW) back on the dump site including all materials, labour and manpower, equipments required for demolition of masonry / RCC Work, excavation and dewatering of trenches etc complete as directed by Engineer in charge and to the satisfaction of engineer in charge.	1	No.	1	-	Activity completed.

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103	Hand Crushing of the debris of compound wall & pump house in the temporary storage area, sieving and sorting into fractions to be ultimately used in temporary access road and pathway construction and disposing the unserviceable materials back onto the dumpsite in profiling layers including all tools and plants, machinery and equipments, labour, manpower, loading, unloading and transport of the sorted fraction of wastes from the sorting area to Depot Area for storage and further back to the dumpsite etc complete as directed by engineer in charge.	1500	cu.m	1500	-	Activity completed.
<b>Part 2 - Excavation and Handling of Wastes including Sorting and Segregation, Storage of Segregated fraction and reuse / disposed back to dumpsite closure layers</b>						
201	Excavation, Loading, Unloading and transportation (within a lead of 1 km) of MSW in cutting from top and sides of dumpsite onto trucks to the temporary sorting and segregation area including all tools and plants, materials, labour and manpower, excavators, dozers and other heavy machinery, dumper trucks and loader backhoes, front end loaders, tractor trailers, poclains etc complete as directed by engineer in charge and to the satisfaction of engineer in charge - (55000 cu.m = 55550 Tonnes).	55550	Tonnes	55550	-	Activity completed.

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202	<p>Waste sorting, Sieving and Segregation: The sorting, sieving and segregation of excavated wastes from the dumpsite is required in order to achieve the following fractions:</p> <ul style="list-style-type: none"> <li>› Organic wastes - to be disposed back to the dumpsite in profiling layers below liner. Portion of the partially degraded organic waste to be utilized by contractor for conversion to compost of 1000 kgs quantity; which will be utilized as compost manure in vegetative layer (landscaping and development of Shrubs /grass)</li> <li>› Plastics - to be disposed back to the dumpsite in profiling layers below liner.</li> <li>› Inert waste &gt; 3 cm - to be disposed back to the dumpsite in profiling layers below liner.</li> <li>› Coarse fraction 0.8 - 3 cm - to be disposed back to the dumpsite in profiling layers below liner.</li> <li>› Fine fraction 0.4 cm - 0.8 cm - to be utilized in the Gas Drainage Layer after profiling and compaction of wastes - First cover layer.</li> <li>› Fine fraction &lt; 0.4 cm - to be disposed back to the dumpsite in profiling layers.</li> </ul> <p>The sorting include hand picking of plastics and recyclables and Screening of wastes in Troumel Screens results in Sieving and Segregation of different fractions as highlighted above and as per detailed specifications given in tender documents. The sorted fractions to be stored in the depot and storage area for temporary storage. The Contractor shall design the sorting, sieving and segregation area and install the mechanized equipment / machinery necessary for the sorting, sieving and segregation. The method of sorting can be freely chosen by the contractor under the conditions that the above described fractions are obtained. The sorting equipment shall be placed in a temporary enclosed shed building with appropriate base of PCC with liner system for control of ground water contamination through leachates or any spill of materials, avoiding any spread of pollution due to dust emissions, spillages and ground water contamination in the immediate surroundings. Volume of excavated material to be sent to sorting facility is estimated to 55550 Tonnes However contractor shall sort and segregate sufficient quantity of wastes in order to get the required volume of material for Gas Drainage Layer laying works (0.3 m cover over the profiled wastes). The item includes all tools and plants, sorting and segregation equipments and machinery, temporary enclosed shed building setup, all required manpower and labour, commissioning and decommissioning of waste sorting, sieving and segregation equipments (Belt Conveyors, air lift, gravity separator equipments, Troumel screens etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.</p>	55550	Tonnes	42780	12770	42780 Quantity of waste has been sieved. The sieving of remaining quantity of MSW is in progress

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203	Loading, Unloading & Transport of the Sorted fraction of wastes from the Sorting, Sieving and Segregation Area to the Depot / Storage Area for storage and further handling and disposing back to the dumpsite / temporary composting area including all tools and plants, manpower and labour, equipments and machineries such as excavators, front end loaders, dumper trucks and other heavy machinery as required etc complete as directed by Engineer in charge and to the satisfaction of engineer in charge					
a	Organic wastes (estimated value of 23% by weight) - Density - 0.3 Tonnes per cu.m	3795	Tonnes		to be measured	-
b	Plastics (estimated value of 10% by weight) - Density - 0.1 Tonnes per cu.m	550	Tonnes		to be measured	The quantity of separated plastic will be measured at the time of disposing back to dump site / for co-incineration in cement kiln
c	Inert waste (estimated value of 13% by weight) - Density - 1.5 Tonnes per cu.m	10725	Tonnes	880.58	to be measured	88058 Tonnes of quantity disposed back to dump. The balance quantity to be disposed back to dump site.
d	Coarse fraction 0.8 – 3 cm (estimated value of 17% by weight) - Density - 1.5 Tonnes per cu.m	14025	Tonnes		to be measured	The quantity of sieved material will be measured at the time of disposing back to dump site
e	Fine Fraction 0.4 - 0.8 cm (estimated value of 16% by weight) - Density - 1.3 Tonnes per cu.m	11440	Tonnes		to be measured	The quantity of sieved material will be measured at the time of disposing back to dump site
f	Fine Fraction < 0.4 cm (estimated value of 21% by weight) - Density - 1.3 Tonnes per cu.m	15015	Tonnes	1800	to be measured	The quantity of sieved material has to be measured.
g	Rejected Materials.	-	Tonnes	12046	to be measured	rejected material of 12046 Tonnes disposed back to dump. The balance quantity to be disposed back to dump site.

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<b>Part 3 - Profiling / Reshaping of waste dump site</b>						
301	<p>Profiling of wastes - Levelling and Reformation of Slopes along the entire area of dump site by excavation and relocating the MSW / dumping and filling of the low areas by shifting MSW and achieving required elevation levels as per future layout of landfill using a total station equipment for levelling, formation of berms, side slopes achieving total height of the closed dump site as per future layout drawing above ground level. Relocating the MSW from areas adjoining to the foot print on the top of landfill / side slopes, slopes to be maintained in 1 V to 3.5 H on all sides of the landfill during profiling, stabilization the side slopes and flat top with compaction using compaction rollers. Wherever there is excess MSW the same shall be removed and dumped at locations where filling is required as per levels attained (as per closure contour layout) within the final foot print area of dump site thereby matching the cut and fill volume of waste to achieve final contours as per side slopes. All the activities will be carried out within a lead of &lt; 1 Km including levelling and compaction of the area (on all sides slopes (1:3.5) and flat surfaces) in layers of 300 mm thick by deploying suitable machineries (dumper trucks, excavators, front end loaders, Compaction rollers etc) and using of a 12 - 30 Tonne mobile wheeled landfill compaction roller (cleated, spiked / special wheels) compacting the layers in four ways in 4 passes every time achieving the compacted proctor density of 95% of layers as directed by engineer in charge and to the satisfaction of engineer in charge. The item shall include all labour and manpower, materials, equipments and machinery for shifting of MSW (loader backhoes, front end loaders, tractor trailers, dumper trucks, poclains), levelling, dressing (dozers) and compacting the MSW (landfill compactors / soil compactors), tools and tackles, testing of compaction levels achieved, loading, unloading and transportation, spreading and levelling, fuel, incidental charges, operation charges of equipments etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.</p>	29250	Sqm	25250	4000	25250 Sqm of area has been reshaped and profiled including berms formation.

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
Part 4a - Installation of Final Cover Layers over reshaped dumpsite, Leachate Collection and treatment system, storm water drainage, compound wall, service roads and ancillary civil, mechanical and electrical works						
A	Installation of final cover layer reshaped dumpsite					
401	<p>Providing and Laying over the profiled, levelled and finished surface of waste (duly compacted) cover of Gas Collection and Drainage cum Regulation Layer of 0.3 m thick (300 mm) also acting as support layer for HDPE membrane liner using the Fine granular Fraction (0.4 - 0.8 cm size) generated from Sorting, Sieving and Segregation of Wastes having rounded grain size materials between 40 - 80 mm, laying, placing and spreading, compacting in thickness of 300 mm size having effective porosity for smooth escape of landfill gases as directed by engineer in charge and to the satisfaction of engineer in charge. Rate shall include all labour, manpower, materials required for placing and spreading, compacting with 12 - 30 tonne rollers within a lead of 1 Km, machinery and equipments, fuel oil, incidental and other operational charges etc complete as directed by Engineer in charge. The drainage layer shall have organic content of &lt; 1%. Grain size and organic content shall be tested and got approved from the Engineer in-charge before profiling on landfill site. Washing of drainage layer materials if required and found necessary shall be carried out by the contractor in order to have clean materials.</p>	11440	Tonnes	0	0.4 - 0.8 cm - 3655 Tonnes  0.8 - 3 cm - 8604 Tonnes	<p>Design Changed. Providing and Laying over the profiled, levelled and finished surface of waste (duly compacted) cover of Gas Collection and Drainage cum Regulation Layer of 0.3 m thick (300 mm) also acting as support layer for HDPE membrane liner using the Fine granular Fraction (0.4 - 0.8 cm size &amp; 0.8 - 3 cm size) generated from Sorting, Sieving and Segregation of Wastes having rounded grain size materials between 0.4 - 0.8 cm and 0.8 to 3cm laying, placing and spreading, compacting in thickness of 300 mm size having effective porosity for smooth escape of landfill gases as directed by engineer in charge and to the satisfaction of engineer in charge. Rate shall include all labour, manpower, materials required for placing and spreading, compacting with 12 - 30 tonne rollers within a lead of 1 Km, machinery and equipments, fuel oil, incidental and other operational charges etc complete as directed by Engineer in charge. Grain size and organic content shall be tested and got approved from the Engineer in-charge before profiling on landfill site. Washing of drainage layer materials if required and found necessary shall be carried out by the contractor in order to have clean materials.</p> <p>0.4 - 0.8 cm size in 100 mm thickness 3655 Tonnes 0.8 - 3 cm size in 200 mm thickness 8604 Tonnes</p>

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402	Supply, Laying and Jointing of Non-woven Needle Punched Geo Textile of (250 GSM (grams per sq. m) minimum) of U.V. stabilized polypropylene, polyethylene or polyester material acting as a protection layer below HDPE liner, laid over the Gas Drainage cum regulation Layer including its unrolling, laying, overlapping and jointing with special wending and anchoring ensuring proper joints and junction overlaps, necessary testing as per ASTM / ISO standards etc complete including all materials, labour, transportation, loading and unloading, stacking at safe place, safe handling, welding and jointing equipments with materials, tools and plants etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.	38200	sq.m	-	-	38200 Sq.m of geo textile liner material procured and stored at project site. The activity will be started after completing the shifting of entire sieved material, compaction of profiled dump site and after ensuring the required levels through total survey.
403	Supply, Laying and Jointing of 1.5 mm thick HDPE Membrane Liner (both side textured) acting as a main barrier layer (in the top cover), laid over the Non-Woven Geo Textile including its unrolling, laying, jointing and welding as per ISO / ASTM Standards with proper junction overlaps, welding at junctions/joints using welding machines, providing sufficient anchoring, necessary testing as per ASTM / ISO standards etc complete including all materials, labour and manpower, transportation, loading and unloading, storing and stacking at safe place, safe handling, welding and jointing equipments with materials, tools and plants etc complete as directed by engineer in charge and to the satisfaction of engineer in charge. The HDPE Liner is provided in order to achieve the permeability coefficient of minimum of $1 \times 10^{-7}$ cm/sec as directed by engineer in charge and to the satisfaction of engineer in charge.	38200	sq.m	-	-	38160 Sq.m of HDPE liner material procured and stored at project site. The activity will be started after completing the shifting of entire sieved material, compaction of profiled dump site and after ensuring the required levels through total survey.

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404	<p>Geo Composite (Drainage Mat) having sandwich construction of two Non-woven needle punch geotextiles filtration layers (of 150 GSM) having artificial drainage element (Geo Net) in between of 5 mm thickness having permeability of <math>1 \times 10^{-2}</math> cm/sec including its unrolling, laying, jointing having proper junction overlaps, anchoring, necessary testing as per ASTM / ISO standards etc complete including all materials, labour, transportation, loading and unloading, stacking at safe place, safe handling, welding and jointing equipments with materials, tools and plants etc complete as directed by engineer in charge and to the satisfaction of engineer in charge. The Geo-composite mat shall be protected against physical damages during transport to the site / during storage at the site. Geo-composite rolls on stock shall be protected from UV radiation by covering with tarpaulins. Geo-composites on slopes (in slope direction) shall be in one piece and connection of two roles in slope direction shall only take place on berms. The items is complete including all materials, laying and jointing, anchoring, welding, labour and manpower etc complete as per specifications, as directed by engineer in charge and to the satisfaction of engineer in charge.</p>	38200	sq.m	-	-	<p>37620 Sq.m of Geo textile liner material procured and stored at project site. The activity will be started after completing the shifting of entire sieved material, compaction of profiled dump site and after ensuring the required levels through total survey.</p>



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405	Supply of clean vegetative soil brought from outside (supporting growth of grass, shrubs and lawns) as a final cover layer of thickness of 450 mm consisting of natural soil, silty clays mixed with sand as prevalent in Kadapa Region (lead of 20 Km) and suitable for landscape development including spreading and compaction of native soil in layers of 300 mm minimum thickness to achieve 90% of proctor density. The spreading and compaction can be achieved by means of 12 tonnes soil compaction rollers to required finished thicknesses and laid on slopes, berms and flat surfaces as well as top of closed dumpsite including supply, transportation to site of works, loading and unloading of the materials, all labour and manpower, equipments required for placing and spreading (dozers, loaders backhoe, tractor trailers, dumpers and poclain, front end loaders), compacting with equipments (landfill and soil compactor rollers) and machinery, necessary testing as per ISO / ASTM standards, fuel oil, incidental and other operational charges etc complete as directed by Engineer in charge and to the satisfaction of engineer in charge.	14500	Cum	0	14500	Test report of the vegetative soil from the identified location has been obtained from the Agricultural Department, Kadapa. As per the results the soil is not suitable for using as a vegetative layer. So an alternative location has been identified by the contractor. The test reports are awaited.
406	Supply, providing and laying of Erosion protection layer at the base of the side slopes using large size pebbles / boulders of size (80 to 200 mm) size brought from outside (lead of 20 km), spreading and compaction besides the storm water drainage in cross sectional area of 1.35 Sq.m. (as per drawing), laid along the perimeter of storm water drainage of the dump site and filling of the interstices of the boulders with crushed stones including all materials, manpower and labour, machinery and equipments, transportation, tools and plants, loading and unloading of materials, stacking, placing, spreading and compaction, fuel oil, incidental charges etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.	1070	m	-	1070	550 cub meters quantity of pebbles / boulders procured and stocked at the site for laying.

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1	2	3	4	5	6	7
<b>Part 4b -Installation of Leachate Collection &amp; Treatment System, Storm Water Drainage, Compound Wall, Service Roads and Ancillary Civil, Mechanical and Electrical works</b>						
407	Construction of Brick Masonary Compound Wall of 230 mm thick brick masonry with RCC column with foundation at every 3.5 m intervals, RCC (M20) ground and coping beam and brick masonry foundation throughout the perimeter of the dump site as per drawing including Excavation, dewatering of trenches with suitable disposal of leachates / contaminated waters if any as per pollution regulations, PCC (1:2.5:5), RCC (M20) concreting work, brick masonry foundation in CM 1:4, Cement Plaster 12 mm thick (CM 1:3), whitewashing on both the sides of the compound wall including all materials procurement as per standards IS Code provisions (first class bricks, cement, sand, steel reinforcement (Fe 415 CRS grade), coarse and fine aggregates, labour and manpower, tools and plants, centering, shuttering and formwork, machine mixing of concrete, placing, vibrating, finishing smooth, watering and curing, supply, loading and unloading, storage and stacking of materials on site, refilling, transportation of surplus earth and disposing within a lead of 1 Km, all incidental and operational charges, tools and plants, machinery, transportation and conveyance to site and store for materials, taxes and duties etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.	1100	m	990	78	Total 1068 meters of length (approx). About 990 meter of length completed. 78 meters of length has been left out for free movement of the trucks carrying the material.
408	Supply, Fabrication, fixing and Installation of a Permanent Gate Structure 4 m wide and 2 m height consisting of Mild Steel round pipes (C Class) as per sectional drawing enclosed in the tender documents including making proper hinged connections to the RCC column posts including all material, labour and manpower, fabrication work, painting (one coat of primer with two coats of good quality standard enamel paint), fixing of gate structure with all tools and plants, labour and manpower, machinery and equipments, transportation and conveyance to site and storage, taxes and duties etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.	2	Nos	completed	-	Gate Structures Installed.

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409	<p>Construction of RCC leachate collection sumps of size 2.5 m diameter x 3 m depth in RCC M 25 (water retaining structure with water proof plaster inside) with manhole chamber (as per Drawing IND 49-1/13 and IND 49-1/09) from the manhole with excavation, dewatering of trenches, laying of RCC Raft foundation and walls, top slab (with RCC manhole and precast RCC Cover) with steel reinforcement, internal water proof plaster, external smooth plaster, provision of HDPE 1.5 mm thick lining on inside surface of the tank (as leachates are corrosive in nature). The consolidated item shall be executed as per standard IS specifications including 110 mm dia. HDPE Plain Pipe 6 Kg/cm<sup>2</sup> pressure as per IS 4984/14333, PE 100 grade – for pumping of leachates from the leachate collection sumps – installed in the Leachate collection sumps. including all materials as per IS Code provisions (cement, sand, steel (Fe 415 CRS grade), coarse and fine aggregates, 200 mm diameter HDPE puddle pipes provision in RCC) etc, labour and manpower, tools and plants, supply, loading and unloading of materials, excavation along with dewatering and suitable disposal of leachate waters as per environmental standards if any, machine mixing of concrete, placing, vibrating, finishing smooth, watering and curing, refilling of trenches, transportation of surplus earth and disposing within a lead of 1 km, all incidental and operational charges, tools and plants, machinery, shuttering and formwork, transportation and conveyance to site and store for materials, taxes and duties etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.</p>	19	Nos	Civil works completed	slabs and finishing works under progress	HDPE lining work inside the leachate wells to be taken up. Approval accorded for the modification of length of leachate pipe of 15 meters.

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410	Providing, Laying and Jointing of factory made Plain / Perforated & Slotted Leachate Drainage HDPE pipes (as per IS 14333, PE 100 grade and pressure class of 6 kg/cm <sup>2</sup> ) as per specifications mentioned in the tender documents and wrapped on site with Non-Woven Needle punched Geo textile (150 GSM) around the pipe as a filtration layer during laying operations; the pipes with geo textiles will be laid in course sand bedding (fresh sand brought from outside) in slope of 1% towards the leachate collection sump including excavation, dewatering of trenches and suitable disposal of leachates / contaminated waters as per applicable environmental regulations, all materials, lowering, laying, welding and jointing of HDPE pipes, testing for any leakages as per IS codes, laying with sand bedding in slopes of 1%, tools and plants, labour and manpower, transportation to site of works with storage, all incidental expenses etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.					
a	110 mm dia. HDPE Pipe - 6 Kg/cm <sup>2</sup> pressure as per IS 4984/14333, PE 100 grade connecting to the leachate collection sump (as shown in the drawing).	80	m	80	-	80 mts of the pipe is procured and stocked at site
b	200 mm dia. HDPE Perforated / Slotted Pipe warped with Geo Textile - 6 Kg/cm <sup>2</sup> pressure as per IS 4984/14333, PE 100 grade - The slotted leachate drain pipes; a total 3 of 5 pipes connecting to the leachate collection sump (as shown in the drawing). The pipes will run below the wastes (3 Nos) of the dump site interconnecting each of the leachate collection wells. (with excavation of dump)	1000	m	685	-	Approval accorded for the modification of length of leachate pipe of 15 meters (20 meters)
c	200 mm dia. HDPE Perforated / Slotted Pipe warped with Geo Textile - 6 Kg/cm <sup>2</sup> pressure as per IS 4984/14333, PE 100 grade - The slotted leachate drain pipes; a total 2 of 5 pipes connecting to the leachate collection sump (as shown in the drawing). The pipes will run peripheral slotted pipes running all along the periphery of the dump site interconnecting each of the leachate collection wells.	1000	m	842.3	-	842.3 m is laid i.e. as per the actual site conditions

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411	<p>Construction of 4 m wide Bituminous Macadam Service Road with excavation in box cutting, providing and laying 100 thick sub base of Quarry Dust (fraction &lt; 3 mm size) overlaying with two layers of 100 mm thickness of Water Bound Macadam (WBM), overlaid with 75 mm thick bituminous spray grout (BSG) layer (at the rate of 2.5 kg/sq.m with 25 to 40 mm metal) and top carpet (tack coat) of 20 mm thickness along with Kerb wall in RCC M 20 cast in situ of 250 mm x 150 mm thickness on both the sides of road including all materials as per standard specifications for road construction, excavation for roadway in soil by mechanical means, laying of layers, compacting to achieve 95% proctor density, cutting and pushing the earth to side of embankment up to a distance of 500 m including trimming bottom and side slopes in accordance with requirements of lines, grades and cross-sections as per Technical requirements of road construction, spreading and rolling of different layers as per IS Standards (MORTH specifications for WBM Road Construction work), manpower and labour, equipments and machinery, hot mix plant, tools and plants, transportation, loading and unloading of materials, refilling, transportation of surplus earth, all incidental and operational charges etc complete as directed by Engineer in charge and to the satisfaction of engineer in charge. The road construction works shall be carried out as per cross sectional drawing given in the tender document.</p>	1000	m	GSB laying for a length of 490 Mts completed.	balance works under progress for 1000 meters	<p><b>Design Changed.</b> Construction of 4 m wide Service Road with excavation in waste, soil, over existing waste layer sprinkled (7.5%) lime with water solution rolling with vibro roller, providing and laying 435mm thick sub base of G.S.B. overlaying with 225 mm thickness of Wet Mix (WMM), overlaid with 75 mm thick sand layer and top 100 mm thickness of paver block (conforming as per IS 15658:2006) along with Kerb wall in RCC M 20 cast in situ of 250 mm x 150 mm thickness on both the sides of road including all materials as per standard specifications for road construction, excavation for roadway in soil by mechanical means, laying of layers, compacting to achieve 95% proctor density, cutting and pushing the earth to side of embankment up to a distance of 500 m including trimming bottom and side slopes in accordance with requirements of lines, grades and cross-sections as per Technical requirements of road construction, spreading and rolling of different layers as per IS Standards (MORTH specifications for WMM &amp; G.S.B Road Construction work), manpower and labour, equipments and machinery, hot mix plant, tools and plants, transportation, loading and unloading of materials, refilling, transportation of surplus earth, all incidental and operational charges etc complete as directed by Engineer in charge and to the satisfaction of engineer in charge. The road construction works shall be carried out as per cross sectional drawing given in the tender document.</p>

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1	2	3	4	5	6	7
412	Construction of RCC M 20 Open Storm Water Drainage System cast in situ / precast slabs of size 0.3 m x 0.2 m, intermediate drain of 0.5 m x 0.3 m and bottom drain of 1.0 m x 0.6 m, PCC (1:3:6) at base (Refer Drawing No IND 49-1/09) including cement, sand, aggregates (10 to 25 mm size) and Steel of FE 415 CRS Grade as per standard IS Codes, excavation, dewatering of trenches, surface dressing, preparation of bed by levelling, casting of RCC slabs, centering, shuttering, machine mixing, placing, vibrating, finishing smooth, watering and curing, all materials, machineries, tools and tackles, fuel, transportation, incidental and other operation charges etc complete as directed by engineer in charge.					
a	0.3 m x 0.2 m wide drain at top most berm (Type 1)	270	m	-	-	to be started
b	0.5 m x 0.3 m wide drain at intermediate berm (Type 2)	520	m	-	-	to be started
c	1.0 m x 0.6 m wide drain at bottom (Type 3)	1000	m	870 Mts of Raft beam and 600Mts Side Wall completed.	balance works under progress.	<b>Design Changed.</b> Construction of 1.00Mts X 0.60Mts.Drain with excavation in waste, soil, over existing waste layer sprinkled (7.5%) lime with water solution rolling with vibro roller, providing and laying 335mm thick sub base of G.S.B. overlaying with 225 mm thickness of Wet Mix (WMM), including all materials as per standard specifications, spreading and rolling of different layers as per IS Standards (MORTH specifications for WMM & G.S.B Construction work), manpower and labour, equipments and machinery, tools and plants, transportation, loading and unloading of materials, refilling, transportation of surplus earth, all incidental and operational charges etc complete as directed by Engineer in charge and to the satisfaction of engineer in charge.

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1	2	3	4	5	6	7
413	Supply, laying, jointing & fixing 110 OD HDPE pipe PE 100 grade, pressure class 6 kg/cm <sup>2</sup> (as per IS 14333 / 4984) to be laid (at an interval of 30 m down the slopes in the top vegetative layer all along the periphery) having interconnections between the top Berm level storm water drainage to the intermediate berm level storm water drainage for draining of waters from Top berm to intermediate berm including all materials, lowering, laying, welding and jointing, installation of HDPE pipes, testing for any leakages as per IS codes, tools and tackles, equipments, fuel, labour and manpower, transportation to site of works with storage, all incidental expenses and operational charges etc complete as directed by engineer in charge and to the satisfaction of engineer in charge	200	m	0	200	-
414	Supply, laying, jointing & fixing 200 OD HDPE pipe PE 100 grade, pressure class 6 kg/cm <sup>2</sup> (as per IS 14333 / 4984) to be laid (at an interval of 30 m down the slopes in the top vegetative layer all along the periphery) having interconnections between the intermediate Berm level storm water drainage to the bottom ground level storm water drainage for draining of waters from intermediate berm to ground level storm water drainage including all materials, lowering, laying, welding and jointing, installation of HDPE pipes, testing for any leakages as per IS codes, tools and tackles, equipments, fuel, labour and manpower, transportation to site of works with storage, all incidental expenses and operational charges etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.	380	m	0	380	-

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
415a	Supply, laying, jointing & fixing HDPE pipes PE 100 grade, pressure class 6 kg/cm <sup>2</sup> (as per IS 14333 / 4984) to be laid connecting the outlet of ground level Storm Water Drainage / Leachate outlet of the Helophyte pond to the nearby outlet of natural drainage stream adjacent to the dumpsite on west side; storm water drainage outlet running all along the natural drainage stream for maintaining gravity drainage including all materials, lowering, laying, welding and jointing, installation of HDPE pipes, testing for any leakages as per IS codes, tools and tackles, equipments, fuel, labour and manpower, transportation to site of works with storage, all incidental expenses and operational charges etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.					
a	400 OD HDPE pipe (outlet of storm water drainage)	250	m	0	250	yet to start
b	315 OD HDPE pipe (outlet of phytoremediation drainage)	10	m	0	10	yet to start



Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
416	Construction of Underground Raw Water Storage Tank of 50 KL capacity (size 5 x 4 x 3 m depth (2.5 m SWD + 0.5 m FB) for Irrigation water storage purpose in RCC M 25 grade concrete for Irrigation purpose including cement, sand, aggregates (10 to 25 mm size) and Steel of FE 415 CRS Grade along with excavation and dewatering of excavated trenches, surface dressing, preparation of bed by levelling, casting of base raft, walls and top slab in RCC M 25 (water retaining structure), provision of inlet and outlet puddle pipes, CI cowl ventilators, Manhole chambers with RCC Manhole covers of 560 mm Diameter, Plastering inside and outside in CM 1:3, IPS Flooring in PCC 1:2.5:5 with water proofing, RCC Vata on all sides and also vertical wall joints including excavation, centering, shuttering and formwork, machine mixing, placing, needle vibration in concrete works, finishing smooth, watering and curing, refilling of trenches after construction including all materials, machineries, tools and tackles, fuel, transportation of surplus earth and disposing within a lead of 1 Km, all incidental and operational charges, tools and plants, machinery, conveyance to site and store for materials, taxes and duties etc complete etc complete per standard IS Specifications as directed by engineer in charge and to the satisfaction of engineer in charge	1	No	1	-	Activity completed.

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
417	Supply, Installation, Testing and Commissioning of Irrigation System for proper and efficient maintenance of landscaping on the entire closed dumpsite (all side slopes and top flat area, berms, green belt along the road side and compound wall) consisting of Sprinklers (Pop Up) and Hydrant System along with its associated appurtenances and fixtures, irrigation network of HDPE pipes, PE 100 grade as per IS Codes, pressure class 8 kg/cm <sup>2</sup> , (header, lateral and branches along with HDPE fittings and Flush / Air valve arrangements) having inlet connection from the Underground sump location as per the schematic Irrigation Layout Plan including all materials, labour, valve box arrangements for distribution of water for sprinklers, necessary Pretreatment system of softening / pressure filtration or any other treatment as required for water to be utilized for irrigation system. The item is all inclusive of supply, laying of pipes, total installation of sprinklers / hydrant system in the top vegetative soil layer including water treatment system with all materials, labour, transportation to the site, loading and unloading, welding and jointing, equipments and machinery, tools and plants, fuel, all incidental and operation charges and expenses etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.	35600	Sqm	-	35600	Yet to be started

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
418	<p>Construction of Helophyte Filter Pond for Treatment of Leachates of length 200 m having trapezoidal cross section with top width of 4 m and bottom width of 2 m, average depth of 1.0 m having bottom slope of 0.1% along entire length towards the outlet side along approach road side towards south. The helophyte filter consist of laying 1.5 mm HDPE liner with geo textile protection layer at base overlaying 100 mm thick clay layer and 200 mm thick vegetative soil cover layer and pebbles and sand layer on above with RCC M 25 Inlet and outlet basin construction (estimated 15 cu.m volume) for receipt and overflow of treated leachates. RCC M 25 Baffle walls will also be constructed for compartmental flow of leachates. Supply, plantation of specific Weeds plants (helophytes) species in the pond for treatment of leachates. The entire item shall be executed including excavation, surface dressing, preparation, compaction and ramming of bed with levelling, laying of the bed layers with proper compaction, supply, laying, welding and jointing of 1.5 mm of HDPE liner system at base, casting of RCC inlet and outlet chambers on top of the liner system with centering, shuttering, machine mixing, placing, vibrating, finishing smooth, watering and curing with all materials, labour and manpower, machineries, tools and tackles, fuel, transportation to site, incidental and other operation charges etc complete as directed by Engineer in charge and to the satisfaction of engineer in charge.</p>	1	Lumps um	<p>Construction of treated water collection chamber side wall completed.</p> <p>Earth work for Helophyte filter pond is partly completed.</p>	balance works under progress.	-

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
419	Construction of Service Path Way in width of 2.5m on top of the capped dumpsite (in vegetative soil layer on berms and other pathways as shown on the drawings) and 2 m wide adjacent to the side of the Halophyte Filter Pond consisting of supply, laying and compaction of 100 mm thick base layer of coarse aggregates overlaying with 50 mm of sand filling and 80 mm thick Paver Blocks with suitable designed interlock arrangements along with provision of Precast Kerb stones on both sides. The entire item shall be executed including excavation surface dressing, laying of layers and compaction, watering and curing including all supply of all material, labour and manpower, tools and plants, equipments, loading, unloading, fuel, transportation to the site of works, incidental and other operation charges etc complete. as directed by engineer in charge and to the satisfaction of engineer in charge					
a	2.5 m wide over capped dumpsite berms	1500	m	0	1500	yet to start
b	2.0 m wide adjacent to the Helophyte Filter - for Leachate Treatment	200	m	0	200	yet to start

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
420	<p>Construction of Ground Water Quality Monitoring (Piezometric) wells – 4 Nos on all four sides of the closed dump site (shown in the drawings) in the Green belt strip consisting of drilling of borehole of 200 mm diameter upto a minimum depth of 30 m in soil as well as rock strata, Supply and laying of slotted casing pipe of HDPE (6 kg/cm<sup>2</sup> PE 100 grade as per IS 4984/IS 14333) of 75 mm diameter – 28 m length and 2 m of blind pipe on top, filling of the annulus between the casing and the bore with sand and gravels for filtration, bentonite sealing on the top along with a top cap with lock and key arrangements, anchoring of the pad lock with RCC concreting works as per drawings, including all materials, manpower and labour, mechanized drilling equipments, loading, unloading and transportation to the site of all materials, incidental and other operational charges etc complete as directed by engineer in charge and to the satisfaction of engineer in charge. These wells are constructed to monitor the ground water levels and water quality checks during after care of the dumpsite post closure activities.</p>	120	m	0	120	Yet to be started
421	<p>Construction of Ground Water Abstraction bore well – 1 No for Irrigation Purpose near the location of the underground Irrigation water sump (shown in the drawings) in the Green belt area consisting of drilling of borehole of 200 mm diameter upto a minimum depth of 100 m in soil, murrum as well as rock strata, Supply and laying of slotted casing pipe of HDPE (6 kg.cm<sup>2</sup> PE 100 grade as per IS 4984/IS 14333) of 160 mm – 90 m length and 10 m of blind pipe on top, concrete sealing on the top, as per drawings, including all materials, manpower and labour, mechanized drilling equipments, loading, unloading and transportation to the site of all materials, incidental and other operational charges, Yield Testing of Bore well after installation of pumps etc complete as directed by engineer in charge and to the satisfaction of engineer in charge. These wells are constructed and will be used as raw water for irrigation system.</p>	100	m	239	-	Bore well Installed and is under utilisation for construction purpose.

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
422	Supply and Installation of standalone 9 W solar LED street lighting system all along the periphery of the dump site and besides the service road network comprises of a luminaire (lighting fixture with lamp), rechargeable lead acid battery for storage, (PV) modules for charging the battery, suitable electronics for the operation of the lamp, safe charging and discharging of the battery and mechanical hardware for fixing these sub systems of Solar Street Lights. The lighting pole shall be embedded in RCC foundation which shall also be casted on site in M 20 construction. The item includes all materials, excavation for foundation of street light, construction of civil foundation for street lights, installation of all equipments and machinery of the street light pole, labour and manpower, tools and plants, fuel, transportation to the site of works of all materials and equipments, incidental and other operation charges etc complete as per specifications given in tender documents as directed by engineer in charge and to the satisfaction of engineer in charge.	60	No	0	60	yet to start

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
423	Supply, Installation, Testing and Commissioning (SITC) of Mechanical Submersible / Air lift pumps for pumping of clear ground waters and leachates for treatment / irrigation purposes along with Electrical System installations (cabling, push button stations, supply and laying of suitable cabling with cable trays, MCC Panel works (Electrical Panel with Cabling for pumps with control Station near pump installed at each of the location and having PDB panel mounted on wall or floor at the panel room near Main security office at the entry gate) etc) upto the Panel Room for Operation of Pumps and motors for leachate and pumping of water for irrigation purposes including procurement, supply, transportation to site of works, installation and erection of works, testing and successful commissioning of the pumping arrangements, all works as per standards IS codes and materials of standard IS makes as directed by Engineer in charge and to the satisfaction of engineer in charge.					
a	Air Lift Pumps with provision of Air Compressor System for Leachate pumping from installed Passive Gas Collection Wells - 10 cu.m per hr and 25 m head.	7	Nos	0	7	
b	Submersible Clear Water Pumps for Pumping of irrigation waters from Irrigation Water Underground Sump to the Irrigation network of Hydrant and Sprinkler System - 35 cu.m per hr 75 m head.- 1 W + 1 SB	2	Nos	0	2	
c	Submersible Clear Water Pumps for Clear Water Pumping from Ground water borewell 200 mm diameter to the Irrigation Underground Sump - 15 m <sup>3</sup> / hr, 110 m head – 1 W	1	Nos	1	0	Pump installed and is working

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
<b>Part 5 - Infrastructural facilities over the dumpsite including Horticulture and Green belt Development and Project round up</b>						
501	<p>Construction of Passive Gas escape cum Leachate Collection Wells at various locations on the capped dumpsite consisting of drilling of 400 mm diameter of borehole (this will be carried out during the laying of final cover layers after profiling of wastes) through MSW to depths of 8 to 18 m depending on location (approximately 2 m below the waste fill in the natural soil layer) as per drawing using suitable plant, equipment and machinery including Supply, Laying and Jointing of HDPE Pipes of 200 mm diameter (as per IS 14333, pressure class of 6 kg/cm<sup>2</sup>) - blind and perforated pipe (1 mm slots at 2 cm intervals); blind pipe of 0.75 m on top extending 0.3 m above ground level, annulus between 200 and 400 mm around the pipe to be filled up with coarse gravel layer, Top of the gas collection pipe will be connected to the Passive Gas Escape Compost Window by means of header and lateral system of HDPE pipes (as per drawing) provided in compost window, sealing of bentonite layer to be provided near the top in the annulus portion (as per Drawing) along with a cover box with lock and key arrangement. The item rate is to be quoted per no which also covers header and lateral HDPE piping upto the compost window including all leak proof joints (joints coated with FRP Coating), all material, labour, tools and tackles, laying and jointing of HDPE Pipes for bore well, lateral and header piping in the compost window, equipments for drilling of the wells, loading, unloading and transportation of materials, making of air tight joints using FRP Coating on the joints, RCC encasing for the top metal cap and pad lock arrangements, fuel, oil, incidental and other operational charges etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.</p>	65	Rmt.	55	10	construction of passive gas escape cum leachate collection wells (7 nos.) completed.



Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
502	Supply, providing and laying of well matured compost brought from outside and generated from composting of the organic fraction (as certified by agricultural university) in the compost window (2 m x 2 m x 0.45 m) over the lateral and header system in the vegetative soil layer besides the passive gas cum leachate collection wells in size as specified in the drawings including all materials, tools and plants, labour and manpower, transportation to the site, all incidental and operational expenses etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.	7	Nos.	0	7	yet to start
503	Supply, providing, laying, welding and jointing of HDPE (6 kg/cm <sup>2</sup> pressure class, PE 100 grade as per IS 14333) Leachate collection pipe network (in the top vegetative soil layer) from the Passive Gas Collection wells for pumping of leachates upto the halophyte filter along with provision of all necessary interconnections of pipes with leak proof joints (joints coated with FRP Coating) as per drawing from each of the wells including the common header system (as shown in the drawings), provision of control valves of Polypropylene material of construction, as per drawing etc complete including all materials, labour and manpower, tools and plants, equipments and machinery, wending equipments, making of air tight joints, satisfactory commissioning of the system, fuel, transportation to the site, unloading and loading, all incidental and operational charges etc complete as directed by engineer in charge and to the satisfaction of engineer in-charge.					
a	75 OD HDPE Pipe - Laterals connecting to the main header - separate for all seven wells	200	Rmt	200	0	Materials procured and stocked at the site.
b	110 OD HDPE Pipe - Header pipe connecting all seven wells to the Helophyte filter	300	Rmt	300	0	
c	110 OD HDPE Slotted Pipe warped with Geo Textile (150 GSM) (Providing Header and Lateral System in Compost Window)	100	Rmt	100	0	

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
504	Construction of Toilet Block (Male and Female sections) in Brick Masonry and RCC beam-column construction with top Roof Slab of size of 6 x 3.5 m as shown in the drawings including excavation and dewatering of trenches, surface dressing and ramming of base foundation, construction of brick masonry wall footings, casting of RCC beam (ground beam, coping beam and slab level beams) in RCC M 20 (using good quality approved cement, sand, aggregates and steel (CRS) reinforcement), filling of plinth with good quality yellow soil, providing RCC base slab and ceramic tiles flooring inside including wall dado flooring, providing and fixing of good quality IS make Orissa pans, Urinals, counter top wash basins, plumbing (piping and valves) of GI Pipes (of standard ISI Make) using all standard materials, provision of water tank of 2000 liters on terrace of the building, provision of ladder and parapet wall construction on top of terrace with provision of plastering and colour washing on entire building inside and outside, internal wiring and lighting works, electrical supply, provision of drainage system including Septic Tank of appropriate size and capacity (as per natural testing in soil for permeability) as per drawings and specifications including all materials, Doors & ventilation labour and manpower, required machinery, tools and plants, excavation, centering, shuttering and formwork, machine mixing, placing, needle vibration in concrete works, finishing smooth, watering and curing, refilling of trenches after construction, fuel, unloading and loading, transportation of surplus earth and other waste and disposing within a lead of 1 Km, all incidental and operational charges, conveyance to site and store for materials, taxes and duties, fuel and other incidental and operational expenses etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.	1	No	1	finishing work and plumbing works under progress	construction of toilet block completed

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
505	Construction of Panel Room for Electrical Connections (for closure activities) in size of 3 m x 3 m over the RCC Tank (used for irrigation purposes) in Brick Masonry and top Roof Slab as shown in the drawings including excavation and dewatering of trenches, construction of flooring works, RCC Top slab in M20 construction, casting of RCC beam (slab level beams) in RCC M 20 (using good quality approved cement, sand, aggregates and steel (CRS) reinforcement), providing RCC base slab and ceramic tiles flooring inside, provision of door & window, provision of plastering and colour washing on entire building inside and outside, internal wiring and lighting works, electrical supply to MCC Panel, cabling works, provision of Cable trays etc as per drawings and specifications including all materials, labour and manpower, required machinery, tools and plants, excavation, centering, shuttering and formwork, machine mixing, placing, needle vibration in concrete works, finishing smooth, watering and curing, refilling of trenches after construction, fuel, unloading and loading, transportation of surplus earth and other waste and disposing within a lead of 1 km, all incidental and operational charges, conveyance to site and store for materials, taxes and duties, fuel and other incidental and operational expenses etc complete as directed by engineer in charge and to the satisfaction of engineer in charge.	1	No	1	finishing work and electric work under progress	construction of panel room completed.
506	Overall Site Cleanup and removal of construction works, reinstatement of the works back to normal and giving back the rented lands to the land owners by the contractor as directed by engineer in charge and to the satisfaction of engineer in charge	42000	sq.m	0	42000	Will be initiated after the completion of the land fill works.

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
<b>Horticulture and Landscaping</b>						
507	<p>Supplying, Providing, Laying and development of Carpet Grass - Korean/Mexican/Local Grass Lawn (as per Future Layout Drawing) and specifications including Bed Preparation for laying of carpet grass consisting of dressing the surface of the top vegetative layer and laying of 6" layer of fine red soil (brought from outside, covered with thin layer of sand mixed with vegetative soil, watering, rolling with hand roller (4" thickness after rolling), providing carpet grass brought from outside, laying of carpet grass and ramming, watering with providing fertilizers (enriching NPK value of soil), compost and also chemicals for weeds control including the cost of red earth, sand, fertilizers, chemicals &amp; grass, manpower and labour charges, unloading and loading of all materials, transportation to the site of works etc complete as per standard specifications for horticulture development as directed by engineer in charge and to the satisfaction of engineer in charge. The item also covers regular watering at intervals and removal of weeds, protection etc for 45 - 60 days for initial establishment till grass is adequately and sufficiently grown. Maintenance, replacement of worn out of grass upto two years of defect liability period is in the scope of the contractor.</p>	25100	sq.m	0	25100	To be started

Sr. No.	Description of Item	Quantity as per BoQ	Unit	Executed quantity	Balance works to be executed	Remarks
1	2	3	4	5	6	7
508	Supplying, Providing, Laying and development of Hedge / Shrubs Plantations (as per Future Layout Drawing) and specifications including digging the trench of size 45 cm depth, refilling the trench with red soil brought from outside mixed with top vegetative soil layer, providing hedge / shrubs plantations brought from outside, providing red soil and farmyard manure in 4:1 ratio, application of fertilizers and pesticides (@ 20 gms/pit/Sq.m - enriching NPK value of soil) and plant material, compost and chemicals for weeds control including the cost of red earth, fertilizers, chemicals & shrub plantations, manpower and labour charges, unloading and loading of all materials, internal transportation of plants and planting the plants, transportation to the site of works etc complete as per standard specifications for horticulture development as directed by engineer in charge and to the satisfaction of engineer in charge. The item also covers regular watering at intervals and removal of weeds, protection etc for 45 - 60 days for initial establishment till shrubs are adequately and sufficiently grown. Maintenance, replacement of worn out of shrub plantations upto two years of defect liability period is in the scope of the contractor.	4350	sq.m	0	4350	To be started
<b>Part 6 : Cost pertaining to Social Management Plan (From ESMP report) - CSR activities</b>						
601	Cost for implementation of SMP	1	LS	0	1	
<b>Part 7 :Cost of consumables to maintain Horticulture &amp; landscaping during defect liability period of 1 year (after completion of construction works and getting the completion certificate)</b>						
701	Maintenance of Horticulture & landscaping - Consumables like fertilizers, pesticides, removal and replacement of grass etc.	1	LS	0	1	
702	Power Charges @ 250 KW of power consumed per day (365 days)	1	LS	0	1	