

Annexure - 1

Name of Work:- INTERNATIONAL COMPETITIVE BIDDING DOCUMENTS SURVEY, REVIEW THE DESIGNS, REDESIGN WHERE NECESSARY AND BUILD NEW SEWERAGE NETWORK OF ABOUT 116 KM LENGTH INCLUDING SURVEY, DESIGN, CONSTRUCTION OF 02 NOS. OF PUMPING STATIONS AND ALL APPURTENANT STRUCTURES, AND OPERATION & MAINTENANCE OF SEWERAGE NETWORK AND PUMPING STATION FOR A PERIOD OF 15 YEARS AT PAHARI ZONE (V) PAHARI (ZONE V) IN PATNA, STATE OF BIHAR, INDIA

SEWERAGE NETWORK

**TABLE 3 –
BILL OF QUANTITIES OF CIVIL WORKS
Part-1 Construction Civil Works**

S.No.	Item of Work	Quantity	Unit	Rate In Figure	Total Amount
1	2	3	4	5	6
A Sewerage Network For Pahari Zone (V) Pahari (Zone V)					
1	Undertaking preparatory survey, review the design and redesign for the Sewerage Network	LS	Job		
1a	Undertaking preparatory survey and design for Providing Sewage Pumping Station(s), Rising Mains and Allied works	LS	Job		
	Sub Total (1)	LS	Job		
2	Providing Sewerage Network including all appurtenant structures and commissioning including resurfacing and restoration of roads / services etc.				

2.1	Earth work in excavation in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift up to 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m. and any other item required for the completeness of work in all respect as per specification and as directed by the Design Build Operations Engineer . . All kind of soil	967574.25	Cum		
2.2	Extra for every additional lift of 1.5 m or part thereof depth exceeding 1.5m but not exceeding 3.0m in all kinds of soils for item above	265808.25	Cum		
2.3	Extra for every additional lift of 1.5 m or part there of depth exceeding 3.0m but not exceeding 4.5m in all kinds of soils for item above	117532	Cum		
2.4	Extra for every additional lift of 1.5 m or part thereof depth exceeding 4.5m but not exceeding 6.0m in all kinds of soils for item above	51896	Cum		
2.5	Extra for every additional lift of 1.5 m or part thereof depth exceeding 6.0m but not exceeding 7.5m in all kinds of soils for item above	19129	Cum		
2.6	Extra for every additional lift of 1.5 m or part thereof depth exceeding 7.5 m but not exceeding 9.0 m in all kinds of soils for item above	2595.00	Cum		
2.7	Extra for every additional lift of 1.5 m or part thereof depth exceeding 9.0 m but not exceeding 10.50 m in all kinds of soils for item above	2.00	Cum		
2.8	Supplying and making compacted granular material bedding with fine /coarse granular / mooram material such as ballast/ gravel / stone hips / sand of approved quality for making bedding with minimum thickness of one fourth the outside Dia of pipe but not less than 10 cm as per design and for top of the pipes as necessitated at site at all depths and for all size of pipe and any other item required for the completeness of work in all respect as per specification				

	and as directed by the Design Build Operations Engineer . .				
A	Local sand	15652.47	Cum		
B	1:4:8(1 Cement:4coarse sand 8 graded stone aggregate 40 mm nominal size)	3707.00	Cum		
2.9	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth: consolidating each deposited layer by ramming and watering lead. with all lead and lift, complete as per specification and as directed by the Design Build Operations Engineer .	887918.69	Cum		
2.10	Carriage of materials by mechanical transport including loading, unloading and stacking of surplus soil.				
A	up to 1 km	23038	Cum		
B	up to 2 km	23038	Cum		
C	up to 3 km	15359	Cum		
D	up to 4 km	7679	Cum		
E	up to 5 km	7679	Cum		
2.11	Road cutting for Trench Excavation Earth work in excavation in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift up to 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50mand any other item required for the completeness of work in all respect as per specification and as directed by the Design Build Operations Engineer	94494	Cum		

2.12	Carriage of materials by mechanical transport including loading, unloading and stacking of Rubbish.				
A	Up to 1 km	28347	Cum		
B	Up to 2 km	28347	Cum		
C	Up to 3 km	18898	Cum		
D	Up to 4 km	9449	Cum		
E	Up to 5 km	9449	Cum		
2.13	Providing & Laying Non Pressure (NP2) R.C.C Pipes : Supplying RCC NP2 Pipes (Spigot & Socketed) , conveying to site, lowering into trenches at all levels, aligning, laying & jointing of pipes for as per IS: 458 - 1988 (Amended up to date) with Rubber gaskets (EPDM) as per IS: 5382 (Amended up to date) , including cost of Rubber gaskets, lubricants, necessary fittings as per drawing, hydro testing the pipe line with supplying and conveyance of water to site etc., complete as per specifications and as directed by EI.				
A	400 mm dia	2310	Metre		
B	450 mm dia	2715	Metre		
C	500 mm dia	2715	Metre		
2.14	Providing, lowering, laying, aligning, fixing in position at and jointing at all level/ depths ISI marked HDPE pipes of PE-100 grade and PN 6 for sewer application as per IS 14333-1996 (amended upto date) in trenches in complete including all material, labour, testing and commissioning as per Technical				

	specifications, and as per direction of Engineer.				
	200 mm dia	77334	Metre		
	250 mm dia	5159	Metre		
	315 mm dia	4278	Metre		
	355 mm dia	3148	Metre		
2.15	Providing & Laying Non Pressure (NP3) R.C.C Pipes : Supplying RCC NP3 Pipes (Spigot & Socketed) , conveying to site, lowering into trenches at all levels, aligning, laying & jointing of pipes for as per IS: 458 - 1988 (Amended up to date) with Rubber gaskets (EPDM) as per IS: 5382 (Amended up to date) , including cost of Rubber gaskets, lubricants, necessary fittings as per drawing, hydro testing the pipe line with supplying and conveyance of water to site etc., complete as per specifications and as directed by EI.				
A	600 mm dia	996	Metre		
B	700 mm dia	484	Metre		
C	800 mm dia	555	Metre		
D	900 mm dia	990	Metre		
E	1200 mm dia	1879	Metre		
F	1400 mm dia	4205	Metre		

G	1600 mm dia	1440.00	Metre		
H	1800 mm dia	483	Metre		
2.16	Encasing CI/GI/RCC/SW pipes all around including bed concrete with 150mm cement concrete 1:2:4(1 Cement: 2 coarse sand:4 graded stone aggregate 20 mm nominal size) excluding form work etc ,complete as per drawing and as directed by Engineer in charge .				
A	200 mm dia	2007	Cum		
B	250 mm dia	89	Cum		
C	300 mm dia	95	Cum		
D	350 mm dia	89	Cum		
E	400 mm dia	59	Cum		
F	450 mm dia	48	Cum		
G	500 mm dia	50	Cum		
H	600 mm dia	59	Cum		
I	700 mm dia	54	Cum		
J	800 mm dia	97	Cum		
K	900 mm dia	100	Cum		
L	1200 mm dia.	132	Cum		

M	1400 mm dia.	609	Cum		
N	1600 mm dia.	142	Cum		
O	1800 mm dia.	111	Cum		
2.17	Centering and shuttering including strutting, propping etc. and removal of form work for: Foundations, footings, bases for columns, complete as per specification and as directed by EI .				
A	Depth not exceeding 1.5 m	3437	Sqm		
B	Depth exceeding 1.5m . But not exceeding 3m	5638	Sqm		
C	Depth exceeding 3 m . But not exceeding 4.5m	2651	Sqm		
D	Depth exceeding 4.5m . But not exceeding 6m	1758	Sqm		
E	Depth exceeding 6m . But not exceeding 7.5m	1334	Sqm		
F	Depth exceeding 7.5 m But not exceeding 9.0 m	529,00	Sqm		
2.18	Providing, transportation, lowering and fixing Precast RCC circular type manhole 0.91m internal dia at bottom and 0.56m dia at top made up of precast monolithic base, modular riser, and top cone in M-40 grade Cement Concrete placed, reinforcement as per drawing (minimum 100Kg/ Cum of Concrete) and aligned to provide vertical sides, with O ring rubber gasket at each joint, water tight and adjustment rings over top cone, complete with GRP/ FRP (Heavy Duty) type manhole cover, orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mmx25mm and over all minimum length 263 mm and width as 165mm with minimum 112	1933	Each		

	mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing as per drawing and all connections shall have a watertight seal between the pipe and the manhole complete as per standard design for depth of 0.91m including benching cement concrete of 1 : 2 : 4 (1 cement : 2 sand : 4 stone aggregate 20 mm nominal size) as per site requirements.				
2.19	Extra depth for circular type manhole 0.91m internal dia (at bottom) beyond 0.91m but less than 1.67 m For Item above	837	Metre		
2.20	Providing, transportation, lowering and fixing Precast RCC circular type manhole 1.22m internal dia at bottom and 0.56m dia at top made up of precast monolithic base, modular riser, and top cone in M-40 grade Cement Concrete placed, reinforcement as per drawing and aligned to provide vertical sides, with O ring rubber gasket at each joint, water tight and adjustment rings over top cone, complete with GRP/ FRP (Heavy Duty) type manhole cover, orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar (minimum 100Kg/ Cum of Concrete) conforming to IS : 1786 having minimum cross section as 23 mmx25mm and over all minimum length 263 mm and width as 165mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing as per drawing and all connections shall have a watertight seal between the pipe and the manhole complete as per standard design for	1145	Each		

2.21	Extra depth for circular type manhole 1.220m internal dia (at bottom) beyond 1.68M and upto 2.29M for item above	348	Metre		
2.22	Providing, transportation, lowering and fixing Precast RCC circular type manhole 1.52m internal dia at bottom and 0.56m dia at top made up of precast monolithic base, modular riser, and top cone in M-40 grade Cement Concrete placed, reinforcement as per drawing (minimum 100Kg/ Cum of Concrete) and aligned to provide vertical sides, with O ring rubber gasket at each joint, water tight and adjustment rings over top cone, complete with GRP/ FRP (Heavy Duty) type manhole cover, orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mmx25mm and over all minimum length 263 mm and width as 165mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing as per drawing and all connections shall have a watertight seal between the pipe and the manhole complete as per standard design for depth of 2.30 m including benching cement concrete of 1 : 2 : 4 (1 cement : 2 sand : 4 stone aggregate 20 mm nominal size) as per site requirements.Complete as per specification and drawing and as directed by the Design Build Operations Engineer	2014	Each		
2.23	Extra depth for circular type manhole 1.52m internal dia (at bottom) beyond 2.30M for Item above	3037	Metre		
2.24	Providing, transportation, lowering and fixing Precast RCC circular type manhole 1.82m internal dia at bottom and 0.56m dia at top made up of precast monolithic base, modular riser, and top cone in M-40 grade Cement Concrete	165	Each		

	placed, reinforcement as per drawing and aligned to provide vertical sides, with O ring rubber gasket at each joint, water tight and adjustment rings over top cone, complete with GRP/ FRP (Heavy Duty) type manhole cover, orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar (minimum 100Kg/ Cum of Concrete) conforming to IS : 1786 having minimum cross section as 23 mmx25mm and over all minimum length 263 mm and width as 165mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing as per drawing and all connections shall have a watertight seal between the pipe and the manhole complete as per standard design for depth of 2.30 m including benching cement concrete of 1 : 2 : 4 (1 cement : 2 sand : 4 stone aggregate 20 mm nominal size) as per site requirements.				
	Extra depth for circular type manhole 1.82m internal dia (at bottom) beyond 2.30 m for item above	50	Metre		
2.25	Providing, transportation, lowering and fixing Precast RCC circular type manhole 2.42m internal dia at bottom and 0.56m dia at top made up of precast monolithic base, modular riser, and top cone in M-40 grade Cement Concrete placed, reinforcement as per drawing(minimum 100Kg/ Cum of Concrete) and aligned to provide vertical sides, with O ring rubber gasket at each joint, water tight and adjustment rings over top cone, complete with GRP/ FRP (Heavy Duty) type manhole cover, orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mmx25mm and over all minimum length 263 mm and width as 165mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing	49	Each		

	or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing as per drawing and all connections shall have a watertight seal between the pipe and the manhole complete as per standard design for depth of 2.30 m including benching cement concrete of 1 : 2 : 4 (1 cement : 2 sand : 4 stone aggregate 20 mm nominal size) as per site requirments.				
	Extra depth for circular type manhole 2.42m internal dia (at bottom) beyond 2.30m for item above	246	Metre		
2.26	Providing sand cast iron drop connection externally for 60 cm drop from branch sewer line to main sewer manhole including inspection and cleaning eye with chain and lid, sand' cast iron drop pipe and bend encased. all-round with cement concrete 1:5:10 (1 cement: 5 fine sand: 10 graded stone aggregate 40 mm nominal size) with all centering and shuttering required, cutting holes in walls and making good with brick work in cement mortar 1:4 (1 cement: 4 coarse sand) plastered with cement mortar 1:3 (1 cement: 3 coarse sand) on inside of the manhole wall lead caulked joints between sand cast iron pipes and fittings, stiff cement mortar 1:1 (1 cement: 1 fine sand) joints between sand cast iron tee and S.W. pipe, making required channels . complete as per specification and drawing and specifications.				
A	200 mm sand cast iron drop connection	34	Each		
B	Extra for depths beyond 60 cm of sand cast iron drop connection complete	20	m		
2.27	Close timbering in trenches including strutting. Shoring and packing cavities (wherever required) complete. (Measurements to be taken of the face area timbering):				

A	Depth not exceeding 1.5 m	332122	Sqm		
B	Depth exceeding 1.5m . But not exceeding 3m	158331	Sqm		
C	Depth exceeding 3 m . But not exceeding 4.5m	71050	Sqm		
2.28	Close steel in trenches including strutting. Shoring and packing cavities (wherever required) complete. (Measurements to be taken of the face area Steel) and as per specifications and direction of EI .				
A	Depth exceeding 4.5m . But not exceeding 6m	32487	Sqm		
B	Depth exceeding 6m . But not exceeding 7.5m	10660	Sqm		
C	Depth exceeding 7.5 m . But not exceeding 9m	1839	Sqm		
2.29	Construction of granular sub base by providing close graded material conforming to specifications mixing in a mechanical mix plant at OMC, carriage of mixed material by tippers to work site, for all leads & lift, spreading in uniform layers of specified thickness with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per specification and direction of EI . .				
A	GSB @ 200mm thick With material conforming to Grade -I (size range 53mm to 2.36mm) having CBR value-30	40538.12	Cum		
2.30	Providing and laying , spreading and compacting graded stone aggregate (size rang 53mm to .075mm) to wet mix macadam (WMM) specification including premixing the material with water at OMC in mechanical mix plant , carriage of mixed material by tipper to site ,for all leads & lift laying in uniform layers with mechanical paver finisher in sub base / base course on well prepared				

	surface and compacting with vibratory roller of 8 to 10 tonne capacity to achieve the desired density complete as per specification and directions EI . .				
A	WMM / WBM @ 150mm thick with smooth wheeled roller	31132.25	Cum		
2.31	Providing and laying Bituminous macadam using crushed stone aggregates of specified grading premixed with bituminous binder, transported to site by tippers, laid over a previously prepared surface with paver finisher equipped with electronic sensor to the required grade, level and alignment and rolling with smooth wheeled, vibratory and tandem rollers as per as per specifications and directions of EI . .				
A	BM @ 50mm thick. 50-100mm average compacted thickness with bitumen of grade VG-30@3.5%(percentage by weight of total mix)prepared in Batch Type Hot Mix Plant of 100-120 THP capacity	11858.31	Cum		
2.32	Providing and laying Semi dense Bituminous concrete using crushed stone aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work onsite by tippers, laying with paver finisher equipped with electronic sensor to the required grade, level and alignment and rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction and density as per specification, complete and as per directions of EI . .				
A	SDBC @ 25mm thick. 25mm compacted thickness with bitumen of grade VG-30@5% (percentage by weight of total mix) and lime filler@2% (percentage by weight of aggregate) prepared in Batch Type Hot Mix plant of 100-120 THP capacity.	12608.40	Cum		
2.33	Pumping out water caused by spring, tides or river seepage, broken water mains or drains or like (Provisional) and as per specifications and direction of	731208	KL		

	DesignBuild Operations Engineer .				
	Note: Joint record of all such pumping to be kept for payment in the form of logbook duly sign by client & contractor				
2.34	Demolishing R.C.C work manually /by mechanical means including stacking of steel bar and disposal of unserviceable material with all lead and lift and as per specifications and direction of Design Build Operations Engineer . .	5273	Cum		
2.35	Demolishing Brick work manually /by mechanical means including stacking of serviceable material and disposal of unserviceable material with all lead and lift and as per specifications and direction of Design Build Operations Engineer. .	5273	Cum		
	Sub total (2) (Sr. no.2.1 to 2.37 above)				
3	<p>Providing House connections, Including construction of collection pits and its further joining with main sewer line with PVC pipe of 160 mm dia. Construction of collection pit 230 mm thick Brick Masonry in CM 1:4, including plastering 15mm thick in CM 1:4 for both outside & inside (neat cement finish inside), 100 mm thick coping around property chamber walls in M-20 concrete, PCC M 15 for bed of 150 mm thick & benching 75mm thick, Precast Concrete cover and frame (Medium duty) As per IS 12592 to be provided.</p> <p>The work includes excavation, refilling of excavated material with compaction, Connection between manholes in the streets and collection pit. supply, delivery and laying of polyvinyl chloride (PVC) Pipes of 160 mm dia with ISI mark intended for underground (buried) non pressure gravity drain and sewer applications conforming to relevant IS with latest amendments as per drawing and store in closed shed duly protected from sun rays, should be</p>				

	completed as per specifications, drawing and as per directions of Design Build Operations Engineer				
3.1	For collection pit, with clear inside opening of 900 x 800 mm, depth 450 mm,	31000	Each		
4	Relocation of utilities	LS	job		
5	Environmental Mitigation & Monitoring Cost (Pre-construction / Post construction) which includes all Environmental e.g. Air, Water, Noise, Soil, Metrological Data etc.	LS	job		
6	Supply & Laying of lateral/branch/trunk Sewers by trenchless method				
6.1	Installation of product pipe by Guided Auger Boring method including making of entry and exit pits, all related civil works like excavation, shoring / strutting etc shielded excavation through auger boring process, lowering of pipe segments in the jacking pit, laying and jointing of product pipeline through jacking process from the jacking pit and restoration of site at after project completion as per the instructions of the Engineer - In - Charge all complete except the cost of the pipe (upto 100 meter of installation length)				
A	200 mm dia	321	RM		
B	250 mm dia	550	RM		
C	300 mm dia	103	RM		
D	350 mm dia	115	RM		
E	400 mm dia	528	RM		

F	450 mm dia	681	RM		
G	500 mm dia	878	RM		
H	700 mm dia	1042	RM		
I	800 mm dia	1259	RM		
J	900 mm dia	990	RM		
	Installation of product pipe by Tunnel Boring Machine including making of entry and exit pits, all related by civil works like excavation, shoring/ strutting etc shielded excavation by Tunnel Boring Machine, lowering of pipe segments in the jacking pit, laying and jointing of product pipeline through jacking process from the jacking pit and restoration of site after project completion as per the instructions of the Engineer – in – charge all complete except the cost of the pipe. (upto 100 meter of installation charge)				
A	1200 mm dia	0	RM		
B	1400 mm dia	165	RM		
C	1600 mm dia	0	RM		
D	2000 mm dia.	607	RM		
6.2	Supply of RCC Jacking pipe with SS Collar for trenchless sewer line work. Rate including all carriage levies, taxes and duties				
A	200 mm jacking pipe with SS Collar	321	RM		
B	250 mm jacking pipe with SS Collar	550	RM		

C	300 mm jacking pipe with SS Collar	103	RM		
D	350 mm jacking pipe with SS Collar	115	RM		
E	400 mm jacking pipe with SS Collar	528	RM		
F	450 mm jacking pipe with SS Collar	681	RM		
G	500 mm jacking pipe with SS Collar	878	RM		
H	700 mm jacking pipe with SS Collar	1042	RM		
I	800 mm jacking pipe with SS Collar	1259	RM		
J	900 mm jacking pipe with SS Collar	990	RM		
K	1200 mm jacking pipe with SS Collar	0	RM		
L	1400 mm jacking pipe with SS Collar	165	RM		
M	1600 mm jacking pipe with SS Collar	0	RM		
N	2000 mm jacking pipe with SS Collar	607	RM		
6.4	Repairing and lining of sewer line, to make it functional, true to grade and alignment, as per specification and directions of Design Build Operations Engineer				
	1200 mm dia	600	M		
	1100 mm dia	1500	M		

	1000 mm dia	900	M		
	Sub Total 3 to 6				
	Total Civil Works Network (A) (1 to 6)				