

CHAPTER - 19 : BRIDGE WORKS - SUBSTRUCTURE				
Item No.	Description of Item	Unit	Rate (Rs.)	Cement Qty.(qtl.)
191010	Exploratory drilling of Boreholes down to required depth, drilling of 150mm diameter boreholes in all type of soils except hard rock and large boulders (boulder core more than 30 cm), including refilling and reinstating surface, and disposing off surplus material including use of mechanical rigs with power operated winches as well as percussion / chieselling tool for advancing through occasional seams of hard strata to be employed, where necessary in Dry area			
191011	0m to 10m	metre	1161.50	
191012	10m to 20m	metre	1277.65	
191013	20m to 30m	metre	1393.80	
191014	30m to 40m	metre	1451.88	
191015	40m to 50m	metre	1533.18	
191016	50m to 60m	metre	1626.10	
191017	60 m to 70 m	metre	1742.25	
191020	Exploratory drilling of Boreholes down to required depth, drilling of 150mm diameter boreholes in all type of soils except hard rock and large boulders (boulder core more than 30 cm), including refilling and reinstating surface, and disposing off surplus material including use of mechanical rigs with power operated winches as well as percussion / chieselling tool for advancing through occasional seams of hard strata to be employed where necessary in River bed area including standing/flowing water up to 2 M depth with all necessary arrangements			
191021	0m to 10m	metre	3019.90	
191022	10m to 20m	metre	3252.20	
191023	20m to 30m	metre	3368.35	
191024	30m to 40m	metre	3484.50	
191025	40m to 50m	metre	3600.65	
191026	50m to 60m	metre	3716.80	
191027	60 to 70 M	metre	3949.10	
191030	Extra for 150mm dia bore in hard Rock/ large Boulder at all levels	metre	5226.75	
191040	Drilling of NX size borehole (75 mm dia) in all types of hard rock (fresh rock) and collection of rock core samples from boreholes and preserving in boxes			
191041	0m to 10m	metre	3484.50	
191042	10m to 20m	metre	3716.80	
191043	20m to 30m	metre	3949.10	
191044	30m to 40m	metre	4413.70	
191045	40m to 50m	metre	4646.00	

Item No.	Description of Item	Unit	Rate (Rs.)	Cement Qty.(qtl.)
191046	50m to 60m	metre	4878.30	
191047	60 m to 70 m	metre	5110.60	
191050	Conducting in situ full size Plate load test (PLT) at selected location as per IS: 1888 including making loading arrangements & casting of RCC/cast in situ concrete footing as per codal provisions including excavation and refilling of trial pit			
191051	a. Plate size 30 cm x 30 cm	Each	18584.00	
191052	b. Plate size 45 cm x 45 cm	each	20907.00	
191053	c. Plate size 60 cm x 60 cm	Each	29037.50	
191060	Conducting in situ Vane shear test for soil as per IS 4434	Each	1858.40	
191070	Conducting SCPT for soil as per IS - 4968	Each	40652.50	
191080	Conducting DCPT for soil as per IS - 4968	Each	34264.25	
191090	Conducting determination of California Bearing Ratio as per IS 2720	Each	3484.50	
191100	Taking out 100mm dia & 450mm long undisturbed samples of soil from bore holes, including provision of air tight containers for packing and, labelling incl. transporting the samples to laboratory. Piston sampler shall be used for extracting undisturbed samples where necessary. Samples shall be collected as per IS 2720	Each	116.15	
191110	Taking out 100mm dia & 450mm long disturbed samples of soil from bore holes, including provision of air tight containers for packing, labelling and transporting the samples to laboratory. Samples shall be collected as per IS 2720	Each	116.15	
191120	Conducting standard penetration test as per IS 2131 at approximate 1.5 m intervals in bore holes, as directed by the Engineer in charge	Each	174.23	
191130	Collection of water samples at required intervals	Each	174.23	
191140	Conducting laboratory Tests on collected soil samples as per relevant IS code			
191141	Moisture contents/ Dry density	Each	290.38	
191142	Atterberg Limit	Each	696.90	
191143	Specific Gravity	Each	309.73	
191144	Grain size analysis including Hydrometer analysis	Each	569.14	
191145	Direct Shear Test	Each	2293.96	
191146	Natural density	Each	309.73	
191147	Consolidation test	Each	2323.00	
191148	Unconfined compression test	Each	2323.00	
191149	Tri-axial test	Each	2323.00	
191150	Conducting Laboratory tests on collected ROCK SAMPLES as per relevant IS code			
191151	Density test	Each	387.17	
191152	Water absorption & Porosity	Each	290.38	
191153	Hardness	Each	348.45	
191154	Unconfined compression test	Each	1858.40	

Item No.	Description of Item	Unit	Rate (Rs.)	Cement Qty.(qtl.)
191155	Point load test	Each	1393.80	
191156	Modulus of elasticity	Each	6039.80	
191157	Abrasion testing	Each	2323.00	
191160	Conducting chemical analysis of ground water samples to determine suitability for concreting and aggressiveness in relation to attack on concrete / reinforcement including determination of pH value	Each	2903.75	
191170	Conducting chemical analysis of soil samples to determine aggressiveness in relation to attack on concrete / reinforcement including determination of pH value	Each	3891.03	
191180	Preparation and submission of Final report giving complete and comprehensive record of investigations, laboratory test reports and calculations in approved format	Each	66786.25	
	OPEN FOUNDATION			
192010	Earth work in excavation for foundations and floors of the bridges, retaining walls etc., including setting out, dressing of sides, ramming of bottom, getting out the excavated material, back filling in layers with approved material and consolidation of the layers by ramming and watering etc. incl. all lift, disposal of surplus soil upto a lead of 300 M, all types of shoring and strutting with all labour and material complete as per drawing and technical specification as directed by Engineer in charge			
192011	All kinds of soils	cum	281.19	
192012	Ordinary rock	cum	263.27	
192013	Hard rock (requiring blasting)	cum	380.40	
192014	Hard rock (blasting prohibited)	cum	560.80	
192020	Extra for the quantity of works, executed in or underwater and/ or liquid mud including pumping out water as required	cum	20% of Basic Items	
192030	Providing and laying Plain Cement Concrete 1:3:6 with graded stone aggregate of 40 mm nominal size, in foundation and floors, retaining walls of bridges including mechanical mixing, vibrating, pumping and bailing out water where ever required with all materials and labour complete but excluding the cost of cement and shuttering as per drawings and technical specifications as directed by Engineer	cum	1330.71	2.200

Item No.	Description of Item	Unit	Rate (Rs.)	Cement Qty.(qtl.)
192040	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M35 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality in RCC raft foundation & Pile cap including finishing, Using Admixtures in recommended proportions (as per IS 9103), if approved in Mix design to accelerate or retard setting of concrete and/or improve workability without impairing strength and durability complete as per specifications and direction of the Engineer in charge. Payment for cement, reinforcement and shuttering shall be paid extra	cum	1622.40	4.22 Or as per appd design mix.
192050	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M20 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality in Abutment, pier, wing walls and return walls of Mass cement concrete above RCC raft Including finishing complete as per specifications and direction of the Engineer in charge. Payment for cement, reinforcement and shuttering shall be paid extra	cum	1622.40	3.44 Or as per appd design mix.
192060	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M35 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality for the following Reinforced cement concrete structural elements up to height of 10 M from foundation top level, including finishing, Using Admixtures in recommended proportions (as per IS 9103), if approved in Mix design to accelerate or retard setting of concrete and/or improve workability without impairing strength and durability complete as per specifications and direction of the Engineer in charge. Payment for cement, reinforcement and shuttering shall be paid extra			
192061	Abutment & Pier	cum	1602.80	4.22 Or as per appd design mix.
192062	Wing wall and Return wall	cum	1679.13	4.22 Or as per appd design mix.
192063	Abutment cap, Pier Cap, Inspection Platform & Pedestal over Pier cap, Fender wall, Diaphragm wall, etc.	cum	1755.45	4.22 Or as per appd design mix.
192064	Approach slab at formation level, Dirt wall/ ballast wall at formation level	cum	1831.78	4.22 Or as per appd design mix.

Item No.	Description of Item	Unit	Rate (Rs.)	Cement Qty.(qtl.)
192065	Extra for every increase of 1 M or part thereof in the height above 10 M & 20 M	cum/m height	11.30	4.22 Or as per appd design mix.
192070	Providing, Driving and installing Bored cast in situ Reinforced Cement Concrete piles of specified diameter and length below pile cap in M- 35 grade Design Mix Cement Concrete , using 20 mm graded crushed stone aggregate and coarse sand of approved quality, to carry a safe working load not less than specified, excluding the cost of casing pipe but including the cost of shoe and length of pile to be embedded in pile cap etc complete, concreting by machine batching, machine mixing, scaffolding, using Admixture in recommended proportion(as per IS 9103), if approved in design Mix, placing with tremie pipe, chipping off of pile top to remove laitance concrete above cut off level etc, pumping and bailing out water, with all labour material complete including crossing of tracks if required, as per approved drawing, specification and direction of the Engineer in charge. Length of the pile for payment shall be measured Up to the bottom of pile cap excluding the mud mat. Payment for cement, casing pipe & reinforcement shall be paid extra			
192071	1500mm diameter	metre	15522.49	7.561 Or as per appd design mix.
192072	1200mm diameter	metre	10247.86	4.836 Or as per appd design mix.
192073	1000mm diameter	metre	8282.69	3.360 Or as per appd design mix.
192074	800mm diameter	metre	5231.70	2.180 Or as per appd design mix.
192075	600mm diameter	metre	3489.28	1.209 Or as per appd design mix.
192080	Providing, fabricating and installing of casing pipe for bored piles for all diameters with specified thickness of steel plate including all labour, materials, pumping and bailing out water where ever required, complete as per technical specifications as directed by Engineer in charge. This will include the weight of plate only and no cognizance will be given for the fittings i.e. rivets and welding etc.	MT	50009.56	

Item No.	Description of Item	Unit	Rate (Rs.)	Cement Qty.(qtl.)
192090	Extra for chieselling in addition to boring of piles if chieselling is resorted to in hard rock or big stone boulders larger than 30 cm depth by any means i.e. by chiesel or manual chiesel and hammer method			
192091	1200mm Diameter pile	metre	1266.03	
192092	1000mm Diameter	metre	771.13	
192093	800mm Diameter	metre	583.26	
192094	600mm Diameter	metre	378.56	
192100	Conducting load testing of a single pile Up to following capacity in accordance with IS 2911(Part IV) including installation of loading platform and preparation of pile head or construction of test cap and dismantling of test cap after test etc with all labour, material, tool & plants, equipment, machinery, etc complete as per drawing and specification, as directed by the Engineer			
192101	Initial load test Up to 50 ton capacity pile	Each	34140.36	
192102	Initial load test above 50 ton capacity Up to 100 ton capacity pile	Each	48240.97	
192103	Initial load test above 100 ton capacity Up to 250 ton capacity pile	Each	59817.25	
192104	Extra for every increase of 50 T in pile capacity or part thereof over 250 T	Each	8972.59	
192105	Routine Load Test Up to 50 ton capacity pile	Each	20620.50	
192106	Routine Load Test above 50 ton capacity Up to 100 ton capacity pile	Each	31871.56	
192107	Routine Load Test above 100 ton capacity Up to 250 ton capacity pile	Each	48451.97	
192110	Lateral load testing of single pile in accordance with "IS Code of practice IS: 2911 (Part IV) for determining safe allowable lateral load of pile" with all labour, material, tool & plants, equipment, machinery, etc complete as per drawing and specification as directed by the Engineer			
192111	Piles with lateral load capacity of Up to 10 ton	Each	20620.50	
192112	Piles with lateral load capacity of above 10 ton & Up to 20 ton	Each	33033.06	
192113	Piles with lateral load capacity of above 20 ton	Each	56225.96	
192120	Pulse Echo Test (PET) for integrity testing of piles with contractor's men, materials and machines. The rate includes cost of Inspection of site, preparation of pile head and any other unforeseen cost required for the test, submission of reports in triplicate as per satisfaction of the Engineer in Charge at site	Each	59817.25	
	WELL FOUNDATION			

Item No.	Description of Item	Unit	Rate (Rs.)	Cement Qty.(qtl.)
193010	Earth work in OPEN excavation in foundation of bridges, for placing of well curbs of all shapes and designs in all kinds of soil including taking out the excavated soil, levelling, ramming of bottom of excavation and trimming of sides, returning the soil in layers, consolidation, disposal of surplus soil within a lead of 300 M, incl. all lift, dewatering, shoring and strutting complete as per technical specification and as directed by Engineer in charge. (The compaction of surplus soil when led to the bank will be paid as per relevant item separately)	cum	102.76	
193011	Extra to item for Earth work in excavation over item no. 193010 if the excavation is carried out in Rock not requiring blasting	cum	158.90	
193012	Extra for Earth work in excavation over item 193010 if the excavation is carried out requiring controlled blasting or chieselling where required and permitted by the engineer in charge	cum	292.54	
193020	Providing and constructing Temporary Earthen Island / coffer dam for construction of well foundations, including bailing and pumping out of water, provision of sand bags, wooden ballies, sheet piling, earth, sand or any other suitable material, in water depth upto 1.5m, as required with all labour and material complete job			
193021	For well size (longest dimension) upto 10 M	Each	20423.97	
193022	For well size (longest dimension) above 10 M	Each	133541.81	
193030	Supplying, Fabrication, assembly erection & placing in position of cutting edge of well curb with structural steel including M.S sheet/ Plates of specified thickness for pier/abutment complete as per approved plans and as per direction of Engineering In charge including all operations like cutting, bending, straightening, drilling holes, bolting, riveting, welding, threading, jointing of steel sections including outer and inner places liners and skin plates, stiffeners, hooks bottle nuts, bond rods etc as per design including all ascent, descents, leads, lifts, handing, re-handling, all other obstructions whatsoever, diverting channels, pumping / bailing out of water and wherever required including cost of steel such as flats, sheets, angles, steel bars etc. with all labour and material as a complete job	metre	54339.22	

Item No.	Description of Item	Unit	Rate (Rs.)	Cement Qty.(qtl.)
193040	Dry/Wet Sinking of Circular Wells (Other than pneumatic method) in all types of strata except hard rock requiring ballasting, including bailing and pumping out water, removal of excavated soil, with all labour and material required for sinking as per drawing and direction of the Engineer in charge, disposal of surplus soil upto 1 Km lead in the adjoining bank/embankment (The compaction to be paid separately under the relevant item)			
193041	From initial level of cutting edge & Up to 3m depth	cum	83.35	
193042	From 3m to 10m depth	cum	123.17	
193043	From 10m to 20m depth	cum	173.65	
193044	From 20m to 30 m depth	cum	398.09	
193045	From 30m to 40 m depth	cum	1003.19	
193046	From 40m to 50 m depth	cum	2528.04	
193047	From 50 m depth onwards	cum	6370.67	
193050	Dry/Wet Sinking of Twin D type Wells (Other than pneumatic method) in all types of strata except hard rock requiring ballasting, including bailing and pumping out water, removal of excavated soil, with all labour and material required for sinking as per drawing and direction of the Engineer in charge including disposal of surplus soil in the adjoining bank or within the zone including disposal of surplus soil in the adjoining bank or within the zone including compaction (The compaction to be paid separately under the relevant item)			
193051	From initial level of cutting edge & Up to 3m depth	cum	129.84	
193052	From 3m to 10m depth	cum	206.42	
193053	From 10m to 20m depth	cum	291.01	
193054	From 20m to 30 m depth	cum	667.14	
193055	From 30m to 40 m depth	cum	1681.18	
193056	From 40m to 50 m depth	cum	4236.57	
193057	From 50 m depth onwards	cum	10676.17	
193060	Extra for sinking of wells in hard rock requiring controlled blasting including cost of explosive, detonators, chieselling including all other ancillary works	cum	361.54	
193070	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M35 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality in the following elements of well including finishing, using Admixtures in recommended proportions(as per IS 9103), if approved in Mix design, to accelerate, retard setting of concrete, improve workability without impairing strength and durability complete .. Contd. --			

Item No.	Description of Item	Unit	Rate (Rs.)	Cement Qty.(qtl.)
	.. Contd. -- as per drawings and technical specifications as directed by Engineer. Payment for cement, reinforcement and shuttering shall be paid extra			
193071	In well Kerb	cum	1622.40	4.22 or as per appd design Mix.
193072	In Steining of wells	cum	1622.40	4.22 or as per appd design Mix.
193073	In Bottom plug for wells incl. arrangements for placing concrete under water with tremie or bottom opening skips	cum	1951.23	4.22 or as per appd design Mix.
193074	In Intermediate/top plug without shuttering	cum	1865.76	4.22 or as per appd design Mix.
193075	In Intermediate/Top plug with internal shuttering	cum	1865.76	4.22 or as per appd design Mix.
193076	In Well cap and corbel if provided	cum	1865.76	4.22 or as per appd design Mix.
193080	Supplying and filling ordinary sand/ excavated river bed material, if approved in between bottom plug and top plug in wells including all lead lift handling, re handling, as a complete job. The sand should be simultaneously filled with water for three days to achieve full compaction so that further chances of shrinkage due to voids are eliminated. Note - If sand is brought from a source other than bridge site it shall be paid as NS item	cum	491.33	
	RCC BOX			
194010	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M35 grade (Cast - in Situ) In Bottom/top slab, side walls, toe wall and sumps haunch filling head walls or any other component using 20 mm graded crushed stone aggregate and coarse sand of approved quality of cast-in-situ RCC box of size upto 5 M (bigger inside dimension) including finishing, Admixtures in recommended proportions (as per IS 9103), if approved in Mix design, to accelerate, retard setting of concrete, improve workability without impairing strength and durability, complete as per drawings and technical specifications as directed by Engineer in charge. Payment for cement, reinforcement and shuttering shall be paid extra	cum	1622.40	4.22 or as per appd design Mix.

Item No.	Description of Item	Unit	Rate (Rs.)	Cement Qty.(qtl.)
194020	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Mass Cement Concrete M20 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality in Drop and curtain wall and alike structures below bed level, Including the cost of centring, shuttering and finishing complete as per drawings and technical specifications as directed by Engineer. Payment for cement & reinforcement shall be paid extra	cum	1622.40	3.44 or as per appd design Mix.
	MISCELLANEOUS			
195010	Deduct if 40mm graded stone aggregate is used in place of 20mm graded stone aggregate in any grade of concrete. (Deduction to be made for quantity of concrete)	cum	63.88	
195020	Providing and applying two coats of coal tar or bitumen conforming to IS 3117 - 1965 on the top and sides of RCC box/slabs @ 1.70 Kgs / Sqm after cleaning the surface with all labour and materials complete job as directed by the Engineer	Sqm	86.15	
195030	Centring and shuttering including strutting, propping etc. and removal of form for :			
195031	RCC raft foundation & Pile cap	Sqm	128.80	
195032	Abutment, pier, wing walls and return walls	Sqm	212.70	
195033	Abutment cap, Pier Cap, Inspection Platform & Pedestal over Pier cap, Fender wall, Diaphragm wall, etc.	Sqm	205.20	
195034	Approach slab at formation level, Dirt wall/ ballast wall at formation level	Sqm	128.80	
195035	In well Kerb & Steining	Sqm	216.40	
195036	In Intermediate/Top plug	Sqm	205.20	
195037	In Well cap and corbel if provided	Sqm	128.80	
195038	In Bottom/top slab, side walls, toe wall and sumps haunch filling head walls or any other component	Sqm	212.70	
195040	Providing and laying in position machine mixed, machine vibrated and machine batched Design Mix Cement Concrete M-25 grade (Cast - in Situ) using 20 mm graded crushed stone aggregate and coarse sand of approved quality in jacketing of piers and abutments from bottom of foundation upto a height of 10m including finishing for average 30cm thickness of jacketing. Payment for reinforcement, cement, wire mesh, shuttering, drilling of holes and insertion of rods will be made extra.	Sqm	2107.16	4.03 or as per appd design Mix.
195041	Drilling 32 mm dia holes for jacketing	metre	64.77	

Item No.	Description of Item	Unit	Rate (Rs.)	Cement Qty.(qtl.)
195042	Inserting of dowel bars of specified dia. (cost of rods to be paid extra)	metre	3.94	
	New Items To Be Added By Zonal Railways			
196010				
196020				
196030				
196040				
196050				
196060				
196070				
196080				
196090				
196100				