

Coefficients for Cement consumption for items of IRUSSOR - 2021 (Formation works, Bridge Works and P.Way Works)			
Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
013040	Providing portable fencing along running track where work is to be done in close vicinity of track, maintaining during execution of work and removing after completion of the work as per direction of the Engineer. Fencing shall consist of self supporting steel angles of size 50mm x 50mm x 6mm, 1.5m long provided with hooks etc. and embedded in CC 1:2:4 block of size 0.23m x 0.23m x 0.23m placed at c/c distance of 2m along track. 12mm dia rods in three horizontal layers shall be tack welded with angle posts. Note : Released material will be property of the contractor after completion of work. Cost of cement required for CC blocks shall be paid separately.		
013041	With provision of one 50mm wide retro-reflective tape in horizontal direction, duly secured/tight with vertical posts.	Metre	0.019
013042	With provision of painting verticals & horizontals with red luminous paints / strips of 30cm each with a gap of 30 cm.	Metre	0.019
022030	Providing and laying in position Plain cement concrete of specified Nominal Mix for miscellaneous works like side drains, foundation for OHE masts and other miscellaneous structures excluding the cost of Cement, centering and shuttering - All work up to plinth level :		
022031	1:1½:3 (1 Cement: 1½ coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size)	Cum	4.000
022032	1:2:4 (1 cement : 2 coarse sand (zone-III) : 4 graded stone aggregate 20 mm nominal size)	Cum	3.200
022033	1:2:4 (1 Cement : 2 coarse sand (zone-III) : 4 graded stone aggregate 40 mm nominal size)	Cum	3.200
022034	1:3:6 (1 Cement : 3 coarse sand (zone-III) : 6 graded stone aggregate 20 mm nominal size)	Cum	2.200
022035	1:3:6 (1 Cement : 3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size).	Cum	2.200
022036	1:4:8 (1 Cement : 4coarse sand (zone-III): 8 graded stone aggregate 40 mm nominal size).	Cum	1.700
022040	Providing and laying in position machine batched, machine mixed and machine vibrated Cement Concrete of specified grade as per approved Design Mix (mixed in Mobile Concrete Batching/Mixing Plant at site or RMC from approved plants) using 20mm graded crushed stone aggregate and coarse sand of approved quality in RCC raft foundation & Pile cap including finishing, using Plasticiser in approved proportions (as per IS:9103), to modify workability without impairing strength and durability complete as per specifications and direction of the Engineer in charge. Note: 1. Payment for cement, reinforcement and shuttering shall be made extra under relevant item. 2. Plasticiser shall invariably be used in approved proportion to increase workability with minimum possible quantity of cement for all grade of Design Mix Concrete unless it is specifically approved citing reasons for not using plasticiser at the stage of Mix Design and in that case deduction shall be made as per relevant item.	Cum	As per approved design mix

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022050	Providing and laying in position machine batched, machine mixed and machine vibrated Cement Concrete of specified grade as per approved Design Mix (mixed in Mobile Concrete Batching/Mixing Plant at site or RMC from approved plants) using 20mm graded crushed stone aggregate and coarse sand of approved quality for the following Reinforced cement concrete structural elements up to height of 9.0 m from foundation top level, including finishing, using Plasticiser in approved proportions (as per IS:9103), to modify workability without impairing strength and durability complete as per specifications and direction of the Engineer in charge. Note: 1. Payment for cement, reinforcement and shuttering shall be made extra under relevant item. 2. Plasticiser shall invariably be used in approved proportion to increase workability with minimum possible quantity of cement for all grade of Design Mix Concrete unless it is specifically approved citing reasons for not using plasticiser at the stage of Mix Design and in that case deduction shall be made as per relevant item.		
022051	Abutment & Pier	Cum	As per approved design mix
022052	Wing wall and Return wall	Cum	As per approved design mix
022053	Abutment cap, Pier Cap, Inspection Platform & Pedestal over Pier cap, Fender wall, Diaphragm wall etc.	Cum	As per approved design mix
022054	Approach slab at formation level, Dirt wall/ ballast wall at formation level	Cum	As per approved design mix
022055	Extra for every increase of 1m or part thereof in the height above 9.0 m	Cum	As per approved design mix
022060	Providing and laying Plain Cement Concrete 1:3:6 with graded stone aggregate of 40mm 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	2.200

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Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
022080	<p>Boring, providing and installation of bored cast in-situ Reinforced Cement Concrete piles of specified diameter and length below pile cap of specified grade with Design Mix Cement Concrete, using 20mm graded crushed stone aggregate and coarse sand of approved quality, to carry a safe working load not less than specified, concreting by machine batching, machine mixing, scaffolding, using Admixture in approved proportion (as per IS:9103), placing with tremie pipe, chipping off of pile top to remove laitance concrete above cut off level etc., pumping and bailing out water, by percussion drilling using Direct Mud Circulation (DMC) or Bailor and Chisel technique by tripod and mechanical Winch machine, complete in all respect as per approved drawing, specification and direction of the Engineer in charge.</p> <p>Note:</p> <p>1. Payment for only cement, reinforcement and permanent casing pipe (if any) shall be made extra.</p> <p>2. Length of the pile for payment shall be measured up to the bottom of RCC pile cap.</p> <p>3. Plasticiser shall invariably be used in approved proportion to increase workability with minimum possible quantity of cement for all grade of Design Mix Concrete unless it is specifically approved citing reasons for not using plasticiser at the stage of Mix Design and in that case deduction shall be made as per relevant item.</p>		
022081	1500 mm diameter	Cum	As per approved design mix for quantity of Concrete in pile
022082	1200mm diameter	Cum	As per approved design mix for quantity of Concrete in pile
022083	1000mm diameter	Cum	As per approved design mix for quantity of Concrete in pile
022084	800mm diameter	Cum	As per approved design mix for quantity of Concrete in pile
022085	600mm diameter	Cum	As per approved design mix for quantity of Concrete in pile

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Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
022090	Boring, providing and installation of bored cast in-situ Reinforced Cement Concrete piles using Hydraulic piling Rig of specified diameter and length below pile cap of specified grade with Design Mix Cement Concrete, using 20mm graded crushed stone aggregate and coarse sand of approved quality, to carry a safe working load not less than specified, concreting by machine batching, machine mixing, scaffolding, using Admixture in approved proportion (as per IS:9103), placing with tremie pipe, chipping off of pile top to remove laitance concrete above cut off level etc., pumping and bailing out water complete in all respect as per approved drawing, specification and direction of the Engineer in charge. Note: 1. Payment for only cement, reinforcement shall be made extra. 2. Length of the pile for payment shall be measured up to the bottom of RCC pile Cap. 3. Plasticiser shall invariably be used in approved proportion to increase workability with minimum possible quantity of cement for all grade of Design Mix Concrete unless it is specifically approved citing reasons for not using plasticiser at the stage of Mix Design and in that case deduction shall be made as per relevant item.		
022091	1500 mm diameter	Cum	As per approved design mix for quantity of Concrete in pile
022092	1200mm diameter	Cum	As per approved design mix for quantity of Concrete in pile
022093	1000mm diameter	Cum	As per approved design mix for quantity of Concrete in pile
022094	800mm diameter	Cum	As per approved design mix for quantity of Concrete in pile
022095	600mm diameter	Cum	As per approved design mix for quantity of Concrete in pile

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023090	<p>Providing and laying in position machine batched, machine mixed and machine vibrated Cement Concrete of specified grade as per approved Design Mix (Cast in-Situ) using 20mm graded crushed stone aggregate and coarse sand of approved quality in the following elements of well including finishing, using Plasticiser in approved proportions (as per IS:9103), to modify workability without impairing strength and durability complete as per drawings and technical specifications as directed by Engineer.</p> <p>Note:</p> <p>1. Payment for cement, reinforcement and shuttering shall be made extra under relevant item.</p> <p>2. Plasticiser shall invariably be used in approved proportion to increase workability with minimum possible quantity of cement for all grade of Design Mix Concrete unless it is specifically approved citing reasons at the stage of Mix Design and in that case deduction shall be made as per relevant item.</p>		
023091	In well Curb	Cum	As per approved design mix
023092	In Steining of wells	Cum	As per approved design mix
023093	In Bottom plug for wells including arrangements for placing concrete under water with tremie or bottom opening skips.	Cum	As per approved design mix
023094	In Intermediate/top plug without shuttering	Cum	As per approved design mix
023095	In Intermediate/Top plug with internal shuttering	Cum	As per approved design mix
023096	In Well cap and corbel, if provided	Cum	As per approved design mix
024010	<p>Providing and casting machine batched, machine mixed and machine vibrated Cement Concrete of specified grade as per approved Design Mix, mixed in Mobile Concrete Batching/Mixing Plant at site or RMC from approved plants, (Cast in-Situ/Pre-cast) in bottom/top slab, side walls, toe wall and sumps haunch filling head walls, thrust bed or any other component using 20mm graded crushed stone aggregate and coarse sand of approved quality of RCC box of any size including finishing, Plasticiser in approved proportions (as per IS:9103), to modify workability without impairing strength and durability, complete as per drawings and technical specifications as directed by Engineer in charge.</p> <p>Note:</p> <p>1. Payment for cement, reinforcement and shuttering shall be made extra under relevant item.</p> <p>2. Plasticiser shall invariably be used in approved proportion to increase workability with minimum possible quantity of cement for all grade of Design Mix Concrete unless it is specifically approved citing reasons at the stage of Mix Design and in that case deduction shall be made as per relevant item.</p>	Cum	As per approved design mix

Coefficients for Cement consumption for items of IRUSSOR - 2021 (Formation works, Bridge Works and P.Way Works)			
Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
024020	<p>Providing and laying in position machine batched, machine mixed and machine vibrated Design Mix Cement Concrete, mixed in Mobile Concrete Batching/Mixing Plant at site or RMC from approved plants, of specified grade (cast in-situ) using 20mm graded crushed stone aggregate and coarse sand of approved quality in Drop and curtain wall and alike structures below bed level, complete in all respect as per drawings and technical specifications to the satisfaction of Engineer-in-Charge.</p> <p>Note: Payment for cement, reinforcement and shuttering shall be made extra.</p>	Cum	As per approved design mix
025040	<p>Providing and laying in position machine batched, machine mixed and machine vibrated Cement Concrete of specified grade as per approved Design Mix (mixed in Mobile Concrete Batching/Mixing Plant at site using 20mm graded crushed stone aggregate and coarse sand of approved quality in jacketing of piers and abutments from bottom of foundation up to a height of 10m for designed thickness of jacketing including finishing, using Plasticiser in approved proportions (as per IS:9103), to modify workability without impairing strength and durability complete as per specifications and direction of the Engineer in charge.</p> <p>Note:</p> <ol style="list-style-type: none"> 1. Payment for cement, reinforcement and shuttering shall be paid extra under relevant item. 2. Plasticizer shall invariably be used in approved proportion to increase workability with minimum possible quantity of cement for all grade of Design Mix Concrete unless it is specifically approved citing reasons for not using plasticisers at the stage of Mix Design and in that case deduction shall be made as per relevant item. 	Cum	As per approved design mix

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Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
031010	<p>Providing and laying in position machine batched, machine mixed and machine vibrated Cement Concrete of specified grade as per approved Design Mix (mixed in Mobile Concrete Batching/Mixing Plant at site or RMC from approved plants) using 20mm graded crushed stone aggregate and coarse sand of approved quality for cast in-situ Prestressed (Post-tensioned) concrete girder / Box girders/Slabs for different spans including finishing, using Plasticiser in approved proportions (as per IS:9103), to modify workability without impairing strength and durability complete as per drawings, specifications and direction of the Engineer in-charge.</p> <p>Note:</p> <ol style="list-style-type: none"> 1. Payment for Staging, Shuttering, Cement, reinforcement, HTS cables, sheathing, anchorage cones, stressing of cables and grouting of the ducts shall be made extra under relevant items. 2. Plasticiser shall invariably be used in approved proportion to increase workability with minimum possible quantity of cement for all grade of Design Mix Concrete unless it is specifically approved citing reasons at the stage of Mix Design and in that case deduction shall be made as per relevant item. 		
031011	With Soffit level up to 9m above Bed level	Cum	As per approved design mix
031012	With Soffit level From 9m above Bed Level to 12m above Bed Level	Cum	As per approved design mix
031013	With Soffit level From 12m above Bed Level to 15m above Bed Level	Cum	As per approved design mix
031020	<p>Providing and launching in position machine batched, machine mixed and machine vibrated Cement Concrete of specified grade as per approved Design Mix (mixed in Mobile Concrete Batching/Mixing Plant at site or RMC from approved plants) using 20mm graded crushed stone aggregate and coarse sand of approved quality for the Precast Prestressed (Post-tensioned) Concrete Girder/Box Girders/Slabs in contractor's casting yard in the vicinity of worksite, including finishing, using Plasticiser in approved proportions (as per IS:9103), to modify workability without impairing strength and durability, complete as per drawings, specifications and direction of the Engineer.</p> <p>Note:</p> <ol style="list-style-type: none"> 1. Payment for Shuttering, Cement, Reinforcement, HTS cables, Sheathing, Anchorage Cones, stressing of cables, grouting of the ducts and launching of girder/slab in position shall be made extra under relevant items. However, deduction shall be made in case of slab as per relevant item. 2. For pre-cast item, loading in transport vehicle in casting yard is included and shall not be paid extra. 3. Plasticiser shall invariably be used in approved proportion to increase workability with minimum possible quantity of cement for all grade of Design Mix Concrete unless it is specifically approved citing reasons at the stage of Mix Design and in that case deduction shall be made as per relevant item. 	Cum	As per approved design mix

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Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
031030	<p>Providing and launching in position machine batched, machine mixed and machine vibrated Cement Concrete of specified grade as per approved Design Mix (mixed in Mobile Concrete Batching/Mixing Plant at site or RMC from approved plants) using 20mm graded crushed stone aggregate and coarse sand of approved quality for the Precast Prestressed (Pre-tensioned) concrete girder/slab in contractor's casting yard, including finishing, using Plasticiser in approved proportions (as per IS:9103), to modify workability without impairing strength and durability, complete as per specifications and direction of the Engineer.</p> <p>Note:</p> <ol style="list-style-type: none"> 1. Payment for Shuttering, Cement, Reinforcement, HTS cables including stressing and launching of girder/slab in position shall be made extra under relevant items. However, deduction shall be made in case of slab as per relevant item. 2. For pre-cast item, loading in transport vehicle in casting yard is included and shall not be paid extra. 3. Plasticiser shall invariably be used in approved proportion to increase workability with minimum possible quantity of cement for all grade of Design Mix Concrete unless it is specifically approved citing reasons for not using plasticiser at the stage of Mix Design and in that case deduction shall be made as per relevant item. 	Cum	As per approved design mix
031040	<p>Providing, fabricating & fixing in position to exact design profiles, H.T.S. cables of all classification made from Low Relaxation strands conforming to IS:14268– latest version in Prestressed (Post-tensioned) Concrete girders/slabs etc. including supplying, cutting, making into cables with necessary spacers, colour coding, protecting with water soluble oil at all time, anchoring of cables, supplying and placing spiral corrugated type galvanized metal steel ducts sheathing made up of Cold Rolled Cold Annealed (CRCA) mild steel conforming to IS:513 of required diameter/ thickness, vent pipe, placing, bending, routing, fixing, stressing & grouting of cable ducts with cement grout, Anchorage sets in required number with provision for future prestressing if any including all lead and lift with contractor's own materials, labour, equipments etc. complete as per drawings & specifications. Rate also includes covering anchorage pads with epoxy mortar of approved quality to avoid corrosion. Cement for grouting to be paid separately. Payment shall be made in terms of weight of HTS cables as per drawing.</p>	As per actual site consumption for Grouting of PSC Cables ducts.	As per actual site consumption for Grouting of PSC Cables ducts.
031080	<p>Supplying and laying in position specified grade precast prestressed cement concrete ballast retainers of size, as directed by Engineer In-charge. Payment for Shuttering, Cement, reinforcement, HTS cables, anchorage cones, stressing of cables and grouting of the ducts will be done extra.</p>	Cum	As per approved design mix

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Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
031180	Providing Flood Level Gauges on abutments and piers, made by 20mm thick 1:4 cement plaster for a width of not less than 300mm, duly engraving markings & figures in metres, divided into 10 parts commencing from under-side of girders towards bed, painting markings & figures with black enamel paint in three coats on white background including painting HFL Mark in white by side of gauge with year of occurrence with all Contractor's materials, labour, tools, scaffolding and supports, lead & lifts, curing etc. complete as per approved drawing and as directed by the Engineer in- charge excluding cost of cement which shall be paid extra.	Sqm	0.090
041070	Providing and fixing various size HTS holding down bolts conforming to relevant Codes/Specification in concrete column or in other structures with proper nuts, bolts, washers/plates, grouting of holes with cement or epoxy concrete with all material, labour, T&P as a complete job.	As per actual site consumption for Grouting	As per actual site consumption for Grouting
041071	With Cement Grout. Cost of cement shall be paid extra.		
051050	Providing and laying of Apron with cement concrete blocks cast in-situ and made with nominal mix of 1:2:4 with all material , labour, tools and plants. Note: (1) Payment to be made for concrete only; (2) Cement and shuttering to be paid extra.	Cum	3.200
051070	Providing and laying Pitching with Stone Boulders, weighing not less than 35kg each with voids filled with cement sand mortar 1:4 on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing and Technical Specifications (filter media to be paid separately under the relevant item). Rate is excluding cost of cement which shall be paid extra under relevant item.	Cum	1.250
052010	Providing and laying flooring with rubble stone, laid over 15cm thick CC 1:2:4 and the voids filled with CC 1:2:4 complete with the joints pointed with 1:2 Cement Sand mortar as per drawing and Technical specifications. Payment for cement to be done separately. Voids in the rubble stone to be taken as 35% of the gross volume of the stone layer. Note: Base concrete shall be paid extra under relevant item.	Cum	1.120
052050	Guniting concrete surface with cement mortar of average thickness 25mm along with wire mesh 50x50x3mm, applied with compressor after cleaning surface and spraying complete including curing as per procedure and technical specifications given under Para 209.3 of IRBM. Rate is excluding the cost of cement which shall be paid extra.	Sqm	0.160
052070	Grouting of masonry/concrete by injection process duly Sealing of cracks, through nipples complete as per Technical Specification and procedure given in IRBM Para No 209 including necessary admixture. Payment shall be as per use of cement by weight in case of neat cement/cement mortar grouting and weight of Epoxy in case of Epoxy Grouting. (Cement will be paid extra).		

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Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
052071	Neat Cement Grout with 20% anti shrinkage compound w.r.t. cement.	As per actual site consumption	As per actual site consumption
052072	Cement Sand Mortar (1:1) Grout with 20% anti-shrinkage compound w.r.t. cement.	As per actual site consumption	As per actual site consumption
052090	Applying shotcrete mixture of average thickness 40mm over masonry / concrete including removal of defective concrete, raking the mortar in joints, cleaning the surface thoroughly, fixing 50x50x3mm wire mesh over the surface for application of grout mixture comprising cement, sand, coarse aggregate, water, quick setting compound complete as per procedures and specifications given in IRBM Para No 209(3) including curing. Rate is excluding the cost of cement which shall be paid extra.	Sqm	0.160
052130	Providing weep holes by making suitable opening or drilling in existing Brick Masonry / Plain / Reinforced Concrete abutment, wing wall/return wall with 110 mm dia UPVC pipe (working pressure 4kg/sqcm) extending through the full width of the structure complete and repairing the same with cement mortar 1:2 (1 cement : 2 coarse sand). Rate is excluding the cost of cement which shall be paid extra.	Metre	0.020
052230	Providing & laying non pressure NP-4 Class RCC pipe with collars, jointing with 1:2 cement and ordinary sand mortar including testing of joints, but excluding earthwork with all labour and material as a complete job. Cement for mortar will be paid separately.(Pipes of 600mm dia and above will be laid using crane/hydra).		
052231	300mm dia.	Metre	0.008
052232	450mm dia.	Metre	0.012
052233	600mm dia.	Metre	0.016
052234	900mm dia.	Metre	0.025
052235	1000mm dia.	Metre	0.028
052236	1200mm dia.	Metre	0.034
052237	1800mm dia.	Metre	0.049