



भारत सरकार
GOVERNMENT OF INDIA
रेल मंत्रालय
MINISTRY OF RAILWAYS

भारतीय रेल एकीकृत मानक दर अनुसूची
(फॉर्मेशन कार्य, पुल कार्य एवं पी. वे कार्य)

Indian Railways
Unified Standard Schedule Of Rates
(Formation Works, Bridge Works and P.Way Works)

सीमेंट गुणांक
Cement Coefficients

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Engineering Department

2019

IR Unified Standard Schedule of Rates 2019- Cement Coefficients

**Coefficients for Cement consumption in Indian Railways Unified Standard Schedule of Rates
(Formation Works, Bridge Works and P.Way Works)**

Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
013100	Providing and removing barricading with the help of portable fencing along running track where work is to be done in close vicinity of track. 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 to be paid separately}		
013101	With provision of one 50mm wide retro-reflective tape in horizontal direction, duly secured/tight with vertical posts	Metre	0.019
013102	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	4.00
022032	1:2:4 (1 cement : 2 coarse sand (zone-III) : 4 graded stone aggregate 20 mm nominal size)	Cum	3.20
022033	1:2:4 (1 Cement : 2 coarse sand (zone-III) : 4 graded stone aggregate 40 mm nominal size)	Cum	3.20
022034	1:3:6 (1 Cement : 3 coarse sand (zone-III) : 6 graded stone aggregate 20 mm nominal size)	Cum	2.20
022035	1:3:6 (1 Cement : 3 coarse sand (zone-III): 6 graded stone aggregate 40 mm nominal size)	Cum	2.20
022036	1:4:8 (1 Cement : 4coarse sand (zone-III): 8 graded stone aggregate 40 mm nominal size)	Cum	1.70
022040	Providing and laying in position machine batched, machine mixed and machine vibrated Design Mix Cement Concrete of specified grade (Cast in-Situ) using 20mm graded crushed stone aggregate and coarse sand of approved quality in RCC raft foundation & Pile cap including finishing, using Admixtures in approved proportions (as per IS:9103), to modify workability & other properties 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	As per approved design mix
022050	Providing and laying in position machine batched, machine mixed and machine vibrated Design Mix Cement Concrete of specified grade (Cast in-Situ) using 20mm 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 approved proportions (as per IS:9103), to modify workability & other properties without impairing strength and durability complete as per specifications and direction of the Engineer in charge. Payment for cement, reinforcement, shuttering shall be paid extra.		As per approved design mix

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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 10 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	2.20
022080	Providing, Boring and installing 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, excluding the cost of steel Reinforcement, permanent casing pipe and length of pile to be embedded in pile cap etc. complete, 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 with all labour material complete by percussion drilling using Direct Mud Circulation (DMC) or Bailor and Chisel technique by tripod and mechanical Winch machine 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 drainage arrangements in box portion as per approved drawing/scheme, provision of cutting edges, providing and fixing electrical co		
022081	1500 mm diameter	Cum	As per approved design mix
022082	1200mm diameter	Cum	As per approved design mix
022083	1000mm diameter	Cum	As per approved design mix
022084	800mm diameter	Cum	As per approved design mix
022085	600mm diameter	Cum	As per approved design mix

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Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
022090	Providing, driving and installing Bored cast in-situ Reinforced Cement Concrete piles using Hydraulic piling Rig of specified diameter and length below pile cap of specified grade 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, excluding the cost of permanent casing pipe and length of pile to be embedded in pile cap etc. complete, 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 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 upto the bottom of pile cap excluding the mud mat. Payment for cement, permanent casing pipe (if any) & reinforcement shall be paid extra.		
022091	1500 mm diameter	Cum	As per approved design mix
022092	1200mm diameter	Cum	As per approved design mix
022093	1000mm diameter	Cum	As per approved design mix
022094	800mm diameter	Cum	As per approved design mix
022095	600mm diameter	Cum	As per approved design mix
023090	Providing and laying in position machine batched, machine mixed and machine vibrated Design Mix Cement Concrete of specified grade (Cast in-Situ) using 20mm graded crushed stone aggregate and coarse sand of approved quality in the following elements of well including finishing, using Admixtures in approved proportions (as per IS:9103), to modify workability & other properties without impairing strength and durability complete as per drawings and technical specifications as directed by Engineer. Payment for cement, reinforcement and shuttering shall be made extra.		
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

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Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
024010	Providing and laying in position machine batched, machine mixed and machine vibrated Design Mix Cement Concrete of specified grade (Cast in-Situ/Pre-cast) in bottom/top slab, side walls, toe wall and sumps haunch filling head walls or any other component using 20mm graded crushed stone aggregate and coarse sand of approved quality of RCC box of any size including finishing, Admixtures in approved proportions (as per IS:9103), to modify workability & other properties 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 made extra.	Cum	As per approved design mix
024020	Providing and laying in position machine batched, machine mixed and machine vibrated Design Mix Cement Concrete 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, including centering, shuttering and finishing complete as per drawings and technical specifications as directed by Engineer. Payment for cement, reinforcement and shuttering shall be made extra.	Cum	As per approved design mix
025040	Providing and laying in position machine batched, machine mixed and machine vibrated Design Mix Cement Concrete of specified grade (Cast in-Situ) using 20mm 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 designed thickness of jacketing. Payment for reinforcement, cement, wire mesh, shuttering, drilling of holes and insertion of rods will be made extra.	Cum	As per approved design mix
031010	Providing and laying in position machine batched, machine mixed and machine vibrated Design Mix Cement Concrete of specified grade using 20mm graded crushed stone aggregate and coarse sand of approved quality for cast in-situ Prestressed (Post tensioned) concrete girder / Box girders for different spans including finishing, using Admixtures in approved proportions (as per IS:9103), to modify workability & other properties without impairing strength and durability complete as per specifications and direction of the Engineer in-charge. Payment for Shuttering, Cement, reinforcement, HTS cables, sheathing, anchorage cones, stressing of cables and grouting of the ducts will be done extra under relevant items.		
031011	With Soffit level upto 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
031014	Extra over USSOR Item no. 031013 for Soffit level beyond 15m above Bed Level for every 1m or part thereof	Cum	As per approved design mix

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Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
031020	Providing and laying in position machine batched, machine mixed and machine vibrated Design Mix Cement Concrete of specified grade using 20mm graded crushed stone aggregate and coarse sand of approved quality for the Precast Prestressed (Post tensioned) concrete girder/Box (spans upto 30.5m) in contractor's casting yard, including finishing, using Admixtures in approved proportions (as per IS:9103), to modify workability & other properties without impairing strength and durability, complete as per drawings, specifications and direction of the Engineer. Payment for Shuttering, Cement, reinforcement, HTS cables, anchorage cones, stressing of cables and grouting of the ducts will be done extra. Launching of girder/slab in position is not included in this item.	Cum	As per approved design mix
031030	Providing and laying in position machine batched, machine mixed and machine vibrated Design Mix Cement Concrete of specified grade using 20mm graded crushed stone aggregate and coarse sand of approved quality for the Precast Prestressed (Pre tensioned) concrete girder (spans upto 9.1m) in contractor's casting yard, including finishing, using Admixtures in approved proportions (as per IS:9103), to modify workability & other properties without impairing strength and durability, complete as per specifications and direction of the Engineer. Payment for Shuttering, Cement, reinforcement, HTS cables, anchorage cones, stressing of cables will be done extra. Launching of girder/slab in position is not included in this item and shall be paid extra under relevant item.	Cum	As per approved design mix
031040	Providing, fabricating & fixing in position to exact design profiles, prestressing 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.	As per actual site consumption for Grouting	As per actual site consumption for Grouting
031080	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.	Cum	As per approved design mix

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Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
031120	<p>Design and casting of precast single/twin RCC box with or without common web section including thrust bed for RUB/ROB/Canal works with weigh batching/using RMC of Specified grade controlled concrete and pushing in correct position and alignment below Railway track/Road by jacking by "Box pushing technique" as per approved drawing for vent way of any size with or without surcharge in all types of soils including shoring/strutting whenever required and disposal of surplus earth away from vent way upto a maximum lead of 1 Km including de-watering if required, under traffic conditions of Electrified/Non-Electrified sections, fixing of drag sheets, wearing coat as per approved drawing of M 20 Grade or above concrete, including footpaths/cable ducts with kerbs/crash barriers if required, parapet walls on both sides, including cast in-situ plaques for inscribing particulars of bridge foundation of size 450X450X50mm on bridge abutments/returns, casting of bridge number plaques in situ of overall size 750X720X400mm, drainage arrangements in box portion as per approved drawing/scheme, provision of cutting edges, providing and fixing electrical conduit pipes, junction boxes of approved dimension and quality, all fittings wherever required, mobilization operations, generator of required capacity for power supply, lighting, arrangements, other safety measures like protection of track/road traffic etc., during execution of work if required, with all contractors material, cement, Ready Mixed Concrete (if required), reinforcement steel, structural steel, shuttering, labour, tools and plants, machinery, and any other material required for execution of work in all respect with all lead and lift, transportation and as directed by Engineer in-charge.</p> <p>Note: (1) The rate includes all items of work/supplies for complete job in all respects except cost of Reinforced cement concrete, cement, reinforcement & shuttering of (i) main RCC Box and (ii) Thrust Bed only which shall be paid extra under relevant item of USSOR.</p>	Cum of Concrete	As per approved design mix for concrete quantity in Thrust Bed and Main Box only
031130	<p>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.</p>	Sqm	0.09
041080	<p>Providing and fixing various size HTS holding down bolts conforming to IS:1364 in concrete column or in other structures with proper nuts, bolts, washers/plates, grouting of holes with all material, labour, T&P as a complete job.</p> <p>Note: Cement used in grouting will be paid separately under relevant item.</p>	As per actual site consumption for Grouting	As per actual site consumption for Grouting

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Item No.	Description of Item	Unit for Cement Payment	Cement Qty in Qtl
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	3.20
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	1.25
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. (Base concrete to be paid extra)	Flooring quantity in Cum	1.12
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	0.16
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 admixutre. (Cement wil be paid extra)		
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
052100	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 compoud 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	0.16
052150	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	0.02

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052250	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).		
052251	300mm dia.	Metre	0.008
052252	450mm dia.	Metre	0.012
052253	600mm dia.	Metre	0.016
052254	900mm dia.	Metre	0.025
052255	1000mm dia.	Metre	0.028
052256	1200mm dia.	Metre	0.034
052257	1800mm dia.	Metre	0.049
053010	Surface protection of Piers, Substructure, Box bridges and culverts in river bed by cleaning & preparing the surfaces by acid etching; treating surface with a two-layer plaster; first layer of 7mm (5mm in case of sidewalk) thick with cement (OPC or slag) admixed with an octadecanoic acid based cementitious waterproofing compound (Max. bulk density 0.5 gm/cc), in the weight ratio of 50:3 for cement and waterproofing compound and second layer of 12mm thick cement-sand (1:2.5) plaster, enriched with polyester fibre (to be paid separately) and curing the plastered surface. Treatment shall be impermeable under a water head of 20m. Rate is excluding cost of cement which shall be paid extra. (Note : In lieu of etching with acid the surface can be roughened or bond improved by other appropriate means) complete as per specification.		
053011	Piers, substructure, Box bridges and culverts in river bed	Sqm	0.065
053012	Side walks	Sqm	0.05
053030	Surface protection of Bridge Deck by cleaning and preparing the surface by acid etching; treating the surface with a two-layer plaster; first layer of 5mm thick with cement (OPC or slag), admixed with an octadecanoic acid based cementitious waterproofing compound (bulk density not greater than 0.5 gm/cc) in the weight ratio of 50:3 for cement and waterproofing compound, further enriched with specially fabricated deformed galvanized steel fibre @ 150 gm/sqm of treated surface and second layer of 12mm thick cement-sand (1:2.5) plaster, enriched with polyester fibre (to be paid separately) and curing the plastered surface. Treatment shall be impermeable under a water head of 20m complete as per specifications. Rate is excluding cost of cement which shall be paid extra.	Sqm	0.065

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053040	Shotcreting in two layers (each layer of 38mm thickness) with cement concrete mortar 1:1:2 (1 cement : 1 coarse sand : 2 coarse aggregate) mixing epoxy & fixing welded wire mesh 50mm x 50mm x 3mm in between two layers including cost and conveyance of all materials, labour charges, leads, lifts, centering, scaffolding, machine mixing, laying concrete with shotcrete machine etc. complete as per specification and as directed by Engineer in-charge. Rate is excluding cost of cement which shall be paid extra.	Sqm	0.31