

## **SPECIAL CONDITIONS OF CONTRACT**

**1.0** The special conditions of contract: “The Southern Railway Unified Standard Schedule of Rates 2021” corrected upto “Indian Railway Standard specification for Materials and Works 2010 (Vol.I& II) issued under the authority of Railway Board” of the Engg. Dept., Southern Rly corrected up to date, or CPWD DSR rates 2021 Vol I & II corrected up to date, Indian Railways Code for the Engineering Department 2012 (embodying all correction slips issued upto 63, dated 02.08.2024), Indian Railways Works Manual 2000 (embodying all advanced correction slips upto no. 12 dated 13.08.24), General Conditions of Contract for Services, January 2018, any other approved specifications to the relevant I.S.codes. “The regulations for tenders and contracts”, “Conditions of tender”, “Tender agreement form”, “General conditions of contract 2022, corrected upto date of submission of tender, The “contract labour (Regulation and abolition) Act 1970 and “Central Rules 1971, as amended from time to time and specific drawings issued for the purpose of this work govern this contract.

**1.1** Items in Schedule “A” are based on Southern Railway Unified Standard Schedule of Rates 2021 for Chennai Division or CPWD DSR rates 2021 Vol I & II which does not include the supply of cement and reinforcement except some items wherever mentioned. For this work it is proposed that reinforcement steel will not be supplied by railway and the same has to be procured and supplied by the contractor which will be paid separately by Railway under relevant items of Schedule “A2”.

**1.2** The tenderer shall quote his rate ‘at par’ or a collective percentage “Above” or “Below” the total value of schedule A.

**1.3** Similarly Schedule “B” provides for the items which are not covered by Southern Railway Unified Standard Schedule of Rates 2021 or CPWD DSR rates 2021 Vol I & II. The tenderer shall quote his rate ‘at par’ or a collective percentage “Above” or “Below” for each individual item of schedule B.

**1.4** Schedule “A2” provides Supplying reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete that are covered by Southern Railway Unified Standard Schedule of Rates 2021 or CPWD DSR rates 2021 Vol I & II and the tenderer shall quote his rate ‘at par’ or a collective percentage “Above” or “Below” the total value of schedule A2.

**1.5** If any other items of work covered by Southern Railway Unified Standard Schedule of Rates 2021 or CPWD DSR rates 2021 Vol I & II and not covered by Sch. A but are incidental to the work are required to be carried out during the actual execution of work, the same will have to be carried out at the same percentage as accepted for sch. A of this tender.

**1.6** The tenderer while quoting rates for all the above items shall include the cost of procurement. Excise duty Sales Tax, transportation of materials to the work site and storage etc. Also necessary test certificates will have to be produced by the tenderer with regard to the quality of materials which shall confirm to specification as indicated below:

- CEMENT 43 Grade IS 8112 – 1989
- Grade IS 12269 – 1987

- Reinforcement steel – IS 1786 – 1985

**1.7** The work to be carried out under this contract shall, except as otherwise provided in these conditions, include all labour, materials, (except the materials to be supplied by Railway free of cost) construction plant, equipment and transport which may be required in preparation of and for the full and entire execution and successful completion of the works. The description given in the Schedule of works shall, unless otherwise stated, be held to include carriage and cartage, carrying and hoisting, setting, fitting and fixing in position and all other labour necessary in and for the full and entire execution and successful completion of the works as aforesaid in accordance with good practice and recognized principles and any urgent and temporary works fully contingent upon the works.

**2.0** The tenderer shall in their own interest examine the drawings, conditions of contract and specifications of work. They shall also inspect the site and satisfy themselves on their own as to the hydrological, climatic and physical conditions prevailing at site, the nature, extent and practicability of the works, all existing and required roads and other means of communication and across to the site, whether by water or land, availability of housing and other facilities, the source of supply of different materials and their adequacy, royalty, monopoly ferry charges, labour and probable site for labour camp, stores and godowns etc. They shall themselves obtain all necessary information as to risk, contingencies and other circumstances which may effect or influence their tender. No extra charges consequent on any insufficient appreciation or otherwise shall be entertained.

**2.1** It shall be deemed that the tenderer has inspected the site in all respects as explained in the para 2.0 before quoting his rates and has satisfied himself about the nature and type of work including ancillary works necessary for the satisfactory fulfillment of the contract

**2.2** The tenderer/contractor is required to inspect the sites of works and acquaint himself with site conditions and other factors relating to the works, availability of labour, electricity and water etc. before quoting his rates. The tender submission will be deemed to have been made after such inspection.

**2.3** If there is any variation between the description in the tender and the detailed plans, the Engineer in charge will operate the correct description and his decision is final and binding on the tenderer/contractor.

**2.4** Railways do not guarantee supply of electricity to any of the contractor's works. The contractor shall make his own arrangements for arranging power supply, as may be required for the work. The Railway may, however, assist in recommending his application to the Electricity Authority for the power supply and all cost to be borne by him/ them. If however, Railway's electricity is available in the vicinity and if the contractor requests the same to be provided due to compelling circumstances, the Railway of its sole discretion may agree to provide the same on terms and conditions as may be agreed upon between the Railway and the contractor at contractor's cost.

**2.5** The contractor(s) shall make his/their own arrangement for potable water supply required for execution of the work. The contractor shall also provide and maintain at suitable places easily accessible to labour, sufficient supply of water for drinking.

**2.6** The contractor shall be liable to render full account of all materials to be supplied by Railways for consumption on the works, and keep proper records regarding their use which shall be made available for inspection when required. Without prejudice to the right of the Railway if it is detected that the quantity of cement and/or steel is less than the quantity ascertained/computed according to the prescribed specifications and approved drawings, the cost of cement and/or steel not so used shall be recovered from the contractor(s).

**2.7** Railways also reserve the right to take sample during the course of work to get the cement and steel tested for ascertaining their conformity with specification. The cost of testing will have to be borne by the tenderer/contractor.

### **3.0 MEASUREMENTS**

**3.1** All measurements shall be made in the metric system. Different items of works shall be measured in accordance with the procedures set forth in the relevant sections read in conjunction with G.C.C. and special conditions of the contract.

**3.2** All measurements and computations, unless otherwise indicated shall be carried nearest to the following limits.

i.	Length and breadth	10 mm
ii.	Height, depth or thickness of earthwork, C.C. work	5 mm
iii.	Area	0.01 sqm
iv.	Cubic contents	0.01 cum

**4.0 Setting out works:** The contractor shall be responsible for the true and proper setting out of the works for correctness of the position, levels, dimensions, and alignment of all parts of work and for the provision of all necessary pegs, reference pillars, instruments, equipment, and appliances, and labour in connection therewith. If at any time during the progress of the work any error shall appear or arise in the position of levels, dimensions, or alignments at any part of the works, the contractor, on being required to do so by the Engineer in charge, shall at his own expense rectify such errors to the satisfaction of the Engineer in charge and he shall carefully protect, preserve, and secure all bench marks, site rails, pegs, reference pillars, and other things used in setting out of the works.

The contractor shall have a sufficient number of survey instruments such as theodolites, leveling instruments, leveling staff, etc., and arrange to set out the alignment at his own cost and also establish necessary reference pillars as required and directed by the Engineer.

**5.0 EARTH WORK:** The classifications of soils in excavation shall be decided by the Engineer in charge and his decision shall be final and binding on the contractor. Merely the use of explosives in an excavation will not be considered as a reason for higher classification unless blasting is clearly necessary in the opinion of the Engineer in charge.

**5.1.** Excavation for foundation/foundation works, etc., shall include any wet excavation that may be met with and will be paid for under the respective items of SRUSSOR 2021/CPWD DSR 2021 Vol. I & II, for the

wet excavation or bailing out water with or without mechanical means or for any other precautions of work which may be found necessary during the course of execution. Even if any springs of water are met with, NO EXTRA PAYMENT will be made other than the respective items mentioned in the SRUSSOR 2021/CPWD DSR 2021 Vol. I & II.

**5.2.** Whenever excavation for catch water is ordered, the excavated spoils should be spread, consolidated, and sectioned to the required profile to form a bund on the down hillside of the catch water drain. Payment for excavation shall be made under the relevant items of Schedule as the case may be and no extra payment shall be made for consolidation and sectioning to profile for forming bund and catch water drain.

**5.3.** No payment will be made for any earthwork sinkage below ground level due to soil conditions and payment will be made only based on the original ground levels recorded before the commencement of the work and finished profile of the work. The contractor should study the site conditions before tendering.

**5.4** All excavation for structures shall generally be as small as practicable, consistent with the proper construction of work. Any excavation taken out to a greater depth than that required shall be back filled with concrete of the foundation grade at the cost of the contractor.

**5.5** Where water is met with during excavation due to stream flow, seepage, scorings, rain or other reasons, the contractor shall take adequate measures such as bailing, pumping, constructing diversion channel, drainage channel, bonds and other necessary works to keep the foundation trenches dry and other necessary and to protect the green concrete against damage by eruption or sudden rising of water level. Approval of the Engineer to any method adopted for the adequacy of dewatering and protection arrangements and for the sound safety of the work shall be required.

**5.6** When required by the Engineer, materials in the last 500 mm of depth of the excavation: shall not be removed until immediately before the concrete is to be placed.

**5.7** Refilling of foundation pits and trenches shall be carried out only after the foundation and structure works within the excavation have been inspected and approved by the Engineer. Unless otherwise directed by the Engineer all fillings shall consist of approved materials. All space between foundation concrete and the sides of excavation shall be refilled to the original surface, using approved plant, in single layers not exceeding 250 mm loose thickness which shall be watered and completed to a dry density not less than that of the adjoining soil strata. Timber sheeting and other excavation support shall be carefully removed as the filling proceeds but the removal of such supports will not relieve the contractor of his responsibility for the stability of the works.

## **6.0 REMOVAL OF OBSTRUCTIONS.**

**6.1** Before the work is started, the site shall be cleared of all obstructions like trees and bushes along with their roots, heavy grass and shrubs by the contractor at his own cost.

**6.2** No separate payment will be made for site clearance or jungle clearance or shrubs clearance, brush wood, grass, or other obstructions including small trees of girth not exceeding 30 cm and the rates accepted in this contract are deemed to include all such costs except dismantlement of structure if any which will be paid for suitably under SRUSSOR 2021/CPWD DSR 2021 Vol. I & II as per the rates accepted in the tender schedule.

**6.3** The contractor shall not have any claim in case of delay by the Railway in removal of trees or shifting, raising, removing of telegraph or telephones or electric lines (overhead or underground) and other structure, if any, which may come in way of the work.

## **7.0 CEMENT:**

### **7.1 Procurement of cement**

**7.1.1** Cement to be used on the works should be procured from the main cement plants or from their authorized dealers and each consignment shall be covered with the manufacturer's test certificate.

**7.1.2** The cement used shall be any of the following, with the prior approval of the Engineer:

- 43 Grade Ordinary Portland cement conforming to IS: 8112-2013;
- 53 Grade Ordinary Portland cement conforming to IS: 12269-2013 (See Note 5 below);
- Rapid hardening Ordinary Portland cement conforming to IS: 8041-1990, Reaffirmed Apr 2014;
- High strength Portland Cement conforming to IRS: T: 40;
- Portland slag cement conforming to IS: 455-1989, Reaffirmed Apr 2014 (See Note 1 & 4 below);
- Portland pozzolana cement (fly ash-based) conforming to IS: 1489 (part 2) - 1991, Reaffirmed Apr 2014 (See Note 2 & 4 below);
- Portland Pozzolana cement (calcined clay-based) conforming to IS 1489 (part 2) - 1991, Reaffirmed Apr 2014;
- Sulphate resistance cement conforming to IS: 12330-1988, Reaffirmed Apr 2014 (See Note 3 below);
- Hydrophobic Portland cement conforming to IS 8043-1991, Reaffirmed Apr 2014;
- Low heat Portland cement conforming to IS 12600-1989, Reaffirmed Apr 2014;
- White cement conforming to IS 8042-1989, Reaffirmed Apr 2014;
- 33 grade ordinary Portland cement conforming to IS 269-2013.

**Note 1:** Portland slag cement conforming to IS: 455 may be used for pre-stressed concrete work, provided slag content in cement is not more than 50%.

**Note 2:** Portland Pozzolana cement shall not be used for RCC & PSC works. Portland pozzolana cement can be used only for foundation concrete and concrete works in bridge substructures where reinforcement is not provided for structural strength or reinforcement provided is only nominal for

temperature stresses, etc. When Portland pozzolana cement is used, supporting form work shall not be removed till concrete attains at least 75% of the design strength.

**Note 3:** The sulphate resisting cement conforming to IS: 12330 shall be used only in such conditions where the concrete is exposed to the risk of excessive sulphate attack e.g. concrete in contact with soil or groundwater containing excessive amounts of sulphate. It shall not be used under such conditions where concrete is exposed to the risk of excessive chlorides and sulphate attack both.

**Note 4:** The rate of development of strength is slow in case of blended cement i.e. Portland pozzolana cement and Portland slag cement, as compared to ordinary Portland cement. This aspect should be taken care of while planning to use blended cement. Accordingly, the stage of pre-stressing period of removal of formwork and period of curing, etc., should be suitably increased.

**Note 5:** Caution in use of Cement Grade 53 in construction: Because of the faster hydration process, the concrete releases heat of hydration at a much faster rate initially and the release of heat is higher in case of Grade 53. The heat of hydration being higher, the chances of micro-cracking of concrete are much greater. Thus, during the initial setting period of concrete, the higher heat of hydration can lead to damaging micro-cracking within the concrete which may not be visible at the surface. This cracking is different from shrinkage cracks which occur due to faster drying of concrete in windy conditions. The situation can be worse when we tend to increase the quantity of cement in the concrete with a belief that such increases are better for both strength and durability of concrete. Thus, it is very essential to be forewarned that higher grade cement, especially grade 53, should be used only where such use is warranted for making higher strength concrete and also where good Quality Assurance measures are in place, by which proper precaution is taken to relieve the higher heat of hydration through chilling of aggregates or by proper curing of concrete. There are instances where higher grade cement is being used even for low strength concrete, as mortar, or even for plastering. This can lead to unnecessary cracking of concrete/surfaces. Another issue to be cautioned against is the tendency of the manufacturers to project Grade 53 cement as stronger cement, whereas Grade 33 or 43 are enough to produce the concrete of desired characteristic strength. The scenario of the method of production of cement by various manufacturers should also be kept in mind while ordering various grades of cement. The ability to produce cements of particular fineness gets fixed by the machinery installed by the manufacturers, and thus the ability to produce other various grades of cement by a particular manufacturer also gets limited. Whereas the tendency today is to supply the consumer what he orders for by the manufacturers by simply stamping such grades on the bags. Thus, it is often observed that cement bags marked as grade 33 or 43 may really be containing cements of much higher grade.

**7.2 Supply:** The cement shall be packed in jute sacking bags conforming to IS 2580, double hessian bituminized (CRI type) or woven HDPE conforming to IS 11652. Woven polypropylene conforming to IS 11653, jute synthetic union conforming to IS: 12174, or any other approved composite bags, bearing the manufacturer's name or his registered trademark, if any, with grade, batch no., and type of cement, with date of manufacturing of batch of cement. Every delivery of cement shall be accompanied by a producer's certificate confirming that the supplied cement conforms to relevant specifications. These certificates shall be endorsed to the Engineer-in-Charge for his record. Every consignment of cement

must have identification marks on packages indicating date of manufacturing, grade, and type of cement batch no., etc. Cement brought to works shall not be more than 6 weeks old from the date of manufacture.

### **7.3 Test on cement**

**7.3.1** Test on cement will be conducted as per IS 4031 (part 6). Some of the tests which may be carried out are:

- Compressive strength
  - (a) after 72 hours.
  - (b) after 168 hours.
- Initial & final setting time
- Consistency
- Soundness
- Expansion

Tests must be conducted at approved testing labs. The contractor is responsible for arranging and bearing the cost of these tests.

### **7.3.2 ADULTERATION TESTS**

**Purpose of the test:** The adulteration tests are required to be done to ascertain that cement is free from and adulterator therein.

(a) Sample of cement shall be heated on a steel plate for 20 minutes on a stove. The adulterated cement changes its colour.

(b) Normal solution of HCL shall be added to an equal volume of water and the resultant solution shall be slowly added to small quantity of cement of about 10 grams taken in a test tube. If any large in soluble residue is noticed, it indicates presence of siliceous materials. Efflorescence and frothing indicates presence of admixture of lime stone dust.

(c) A small quantity of cement is taken in a test tube or a measuring cylinder and water added till container is half fill. The mixture is shaken and allowed to settle for a few minutes. The cement particles settled down and the coal ash particles are found to be floating or in suspension as their lighter.

(d) Three small pots 3" x 3" x 1" in size are made from the sample of cement to be tested with 28% water/weight. The pots are covered with moist cloth for 24 hours. The pots should resist an impression of thump nail after 24 hours. After 48 hours, it should be difficult to break with fingers. If the cement is not good, the pot can be broken much easily. However, the first trial does not necessarily indicate that the cement is bad. Cement may be slow setting. Therefore, one more pot may be tested after 48 hours of curing. If this shows no improvement the cement is definitely of a doubtful type and needs further testing-in laboratory.

**7.4** The contractor should submit design for the same before starting the work and obtain the trial mix approved by Engineer-in-charge/Work shop / Perambur, Southern Railway, before the execution of work.

**7.5** The cement shall be used within 3 months of manufacture. The decision of the Engineer in charge as to whether the cement is fit for use in the work shall be final and binding on the contractor. For M 20 and higher mix of cement concrete, the quantity of cement will be based on the design mix. For concreting under water, 10% extra quantity shall be added and allowed towards extra consumption.

**7.6** The minimum grade of plain cement concrete shall be M.20 and that of Reinforcement cement concrete shall be M.25. Only approved design mix shall be used for the concrete. The quantity of cement has to be as per Southern Railway Unified Standard Schedule of Rates 2021 & Indian Railway Standard specification for Materials and Works 2010.(Vol. I & II) or CPWD DSR rates 2021 Vol I & II.

**7.7** The cement consumption of the works which are not based on design mix shall be as per the 'Cement Schedule' and as per the 'Indian Railway Standard specification for Materials and Works 2010 (Vol. I & II)'/Indian Railways Unified Standard Specifications (Formation Works, Bridge Works, and P. Way Works) 2021/ Central Public Works Department Specifications 2019 Vol. I & II of Southern Railway. The weighment batching should be done for the design mix concreting works.

**7.8** If actual consumption is more than the theoretical consumption as per approved design mix, payment shall be restricted to theoretical consumption only. If the actual consumption of Cement is less than the theoretical consumption as per approved design mix, payment shall be restricted to actual consumption of Cement only

**7.9** Empty cement bags would be the property of the contractor and shall be disposed off by the contractor himself. In case the Railway is in need of empty cement bags, good and usable empty cements bags are to be supplied by the contractor at the rate of Rs.2/- per bag for empty cement gunny bags and rs.1.40 per bag for empty polythene/paper bags.

#### **7.10 Cement for grouting**

**7.10.1** Cement for grouting shall conform to the specification laid down in clause of s specifications but rapid hardening Portland cement may be used at temperatures less than 7.2 degrees Celcius.

**7.10.2** Sand where used for large ducts, shall be of a size smaller than the 2 mm.

**7.10.3** Additives (plasticisers) shall be used only when experience has shown that their use improves the quality of the grout. They shall contain no chloride or nitrate or any other ingredients which induce corrosion of steel.

**7.10.4** The compressive strength of the grout at 7 days measured on 100 mm cubes, shall be least 175 kg./Sq.cm. The test cubes shall be cured in a moist atmosphere for 24 hours and subsequent in water.



## **8.0 STEEL**

**8.1** The reinforcement shall be any of the following with the prior approval of the Engineer:

- Grade I mild steel and medium tensile steel bars conforming to IS: 432 (Part I);
- High strength deformed steel bars conforming to IS: 1786;
- Hard drawn steel wire fabric conforming to IS 1566
- Thermo mechanically treated (TMT) bars satisfying requirements of IS: 1786;
- Rolled steel made from structural steel conforming to IS: 2062 Gr A and Gr B.

**8.2** Steel shall be procured from the main producers with steel manufacturing facilities to relevant IS codes. Re-rolled steel will not be accepted. Each batch of steel shall be covered with the manufacturer's test certificate. Apart from MTC, external independent physical and chemical testing is required to be carried out at NABL approved laboratories or Anna University or IIT, Chennai at the frequency prescribed in IS codes.

**8.2.1** Reinforcement steel shall be procured from reputed manufacturers like -

- Steel Authority of India Limited, SAIL
- Rashtriya Ispat Nigam Limited, RINL
- Tata Steel Limited, TSL
- Essar Steel Limited, ESL
- JSW Steel Limited
- Jindal Steel & Power rapa, ISPL
- Ispat Industries Limited, HE
- Bhushan Power & Steel Limited, BPSL
- Bhushan Steel Limited, BSL
- Shyam Steel Industries Limited, SSIL
- Any other steel producer having Integrated Steel Plant.

## **8.3 Codes & specifications**

**8.3.1** The materials and workmanship shall be to the following specification and code of practice (latest versions of specifications/code of practice to be used).

- |       |                 |   |   |
|-------|-----------------|---|---|
| i.    | IRS 1972        | : | Indian Railway Standard Welded Bridge Code.                                   |
| ii.   | IRS (B1 - 2001) | : | Specification for steel girder bridges.                                       |
| iii.  | IS 2062-1992    | : | Specification for weldable structural steel (Grade-B)                         |
| iv.   | IS 9595-1980    | : | Recommendation for metal ARC welding of carbon and carbon manganese steel.    |
| v.    | IS 75-1973      | : | Specification for linseed oil, raw and refined.                               |
| vi.   | IS 77-1976      | : | Specification for linseed oil, boiled, for paints.                            |
| vii.  | IS 102-1962     | : | Specification for ready mixed paint, brushing, red lead, non-setting priming. |
| viii. | IS 133-1961     | : | For fabrication & erection of steel structures (new girder bridges)           |

- ix. IS 814-1974 & IS 816-1969 : Covers welding code.
- x. IS 814 : Electrodes for metal ARC welding of structural steel.
- xi. IS 1149-1982 : High Tensile steel rivet bars for structural purposes.

**8.4** Testing of reinforcement steel for physical properties is required in addition to submission of manufacturer's certificate by the tenderer/contractor for the discretion of the Engineer-in-charge.

**8.4.1** In addition to test certificates produced by the tenderer/contractor, Railway may draw samples and send for testing independently at Railway's own laboratory or through outside agencies, cost of which shall be borne by the contractor. The decision of the Engineer as to the necessity of such tests shall be final and binding on the contractor.

### **8.5 Placing and maintenance of reinforcement in position**

**8.5.1** All reinforcement bars shall be cut and Standard hooks for M.S. rounds made at ends and accurately placed in position as shown on the approved drawings and shall be securely held in position before and during concreting by annealed binding wire and by using dense concrete spacer blocks prepared and cured as directed by the Engineer or his representative, or metal chairs, metal spacers, supporting wires or other approved device at sufficiently close intervals. Bars representative, or metal chairs, metal spacers, supporting to get displaced during concreting or any other operation over the work. Metal supports shall not extend to the surface of the concrete, except where shown on the drawings, pieces of broken stone or brick and wooden blocks shall not be used.

**8.5.2** As far as possible, bars of full length shall be used. Where bars are required or permitted to be lapped by the Engineer, or his representative, the over laps shall be staggered for different bars and located at points, along the span where neither shear nor bending moment is maximum. The concrete cover measured over the reinforcing bars shall be in accordance with the approved drawings.

**8.5.3** The bars shall be kept in position by the following paragraphs maintaining cover.

**8.5.4** In case of beam and slab construction, industrially produced polymer cover blocks of thickness equal to the specified cover shall be placed between the bars and shuttering subject to satisfactory evidence that the polymer composition is not harmful to concrete and reinforcement so as to secure and maintain the requisite cover of concrete over reinforcement. If such cover blocks are not available concrete cover blocks made of concrete having same strength and specification as of the member may be provided.

**8.5.5** In case of dowels for columns and walls, the vertical reinforcement shall be kept in position by means of timber templates with slots accurately cut in them; or with industrially produced polymer cover blocks tied to the reinforcement. Timber templates shall be removed after the concrete has progressed upto a level just below them.

**8.5.6** Spacer bars shall separate layers or reinforcements at approximately 1000 mm intervals. The minimum diameter of spacer bars shall be 12 mm or equal to maximum size of main reinforcement or

maximum size of coarse aggregate whichever is greater. 1.24.1.8. Necessary stays, blocks, metal chains spacers, metal hangers, supporting wires etc., or other subsidiary reinforcement shall be provided to fix the reinforcements firmly in its correct position. The cost of such subsidiary reinforcement will not be paid and shall be included in the steel price quoted.

**8.5.7** Necessary stays, blocks, metal chairs spacers, metal hangers, supporting wires etc., or other subsidiary reinforcement shall be provided to fix the reinforcements firmly in its correct position. The cost of such subsidiary reinforcement will not be paid and shall be included in the steel price quoted.

**8.5.8** Binding wires used for binding/fixing reinforcement shall be galvanized iron wires. The contractor should make his own arrangements for the required binding wire for all RCC works including the works under SRUSSOR 2021/ CPWD DSR rates 2021 Vol. I & II items though it is mentioned otherwise in the SRUSSOR 2021/ CPWD DSR rates 2021 Vol. I & II rates.

**8.5.9** Casting of the RCC work will commence only after final checking of the reinforcement by the Asst. Field Officer Officer Railways/Engineer-in-charge of the work.

**8.6 DRILLING:** All holes shall be drilled, but the Contractor may, if he so prefers, sub- punch them to a diameter 6 mm less than that of the finished holes, e.g. a punch hole which is to be drilled out to 25 mm in diameter shall not exceed 19 mm in diameter at the die end. When the rivet holes are to be sub-punched they shall be marked off with a centre punched and made with the nipple punch or preferably shall be punched in a machine in which the position of the holes automatically regulated. The punching shall be so accurate that when the work has been put together before drilling, a gauge 1.5 mm less in diameter than the size of the punched holes can be passed easily through all the holes.

## **8.7 WELDING**

**8.7.1** All welding work shall be carried out in accordance with the provisions of INDIAN RAILWAY STANDARD WELDED BRIDGE CODE 1972.

**8.7.2** No welding operator shall be employed on the work until he has in the presence of the Engineer/Inspecting Officer (I.O.) pass the appropriate tests laid down in the relevant specifications .Routine re-testing of the welded operators may be required every six months if deemed necessary by the Engineer/I.O.

**8.7.3** The General welding procedure for each type of weld shall be submitted in writing to the Engineer/I.O. for approval before the work is taken up. Where required by the Engineer/I.O., the welding trial shall be carried out on representative samples of materials to be used in the work.

**8.7.4** The welding procedure shall be approved by the Engineer/I.O. based on the welding procedure trial. Approval of the welding procedure shall not relieve the Contractor of his responsibilities for correct welding and minimizing distortion of the finished structure. No departure from the approved welding procedure shall be made without the prior approval of the Engineer/I.O.

**8.7.5** All tack welds shall be of the same quality and size as the first run of the main weld shall fuse completely with the ends of the tack welds to form a regular profile.

**8.7.6** The position of welds required for temporary attachment shall be approved by the Engineer/I.O. before the work starts. The temporary attachments shall be removed without damage to the parent metal, which shall be finished smooth by grinding.

**8.7.7** The contractor shall provide all welding consumables at his own cost. Electrodes shall conform to IRS specification M-28. The wire flux combination for submerged ARC welding shall conform to IRS specification M-39. The welding consumable shall be procured from supplier borne on RDSO's approved list. Manufacturer's test certificate for each lot of welding consumable shall be submitted to the Engineer for verification.

**8.7.8** The welds shall be inspected for compliance as per provisions of IRS: Welded Bridge code. Radiographer/ultrasonic-testing shall not be required.

**8.8 RIVETS AND RIVETING:** Riveting shall be done in accordance with IRS: B1 – 2001

**8.8.1** The dimensions on the drawings refer to the diameters of the rivet holes and their finished rivets. Rivets shall completely fill the hole and shall be machine driven wherever possible by means of pressure or percussion riveters of approved design. The rivets shall be made to relevant specification. The rivets hole shall be 1.5mm (1/16inch) greater than the diameter of the rivets bars used. The clearance i.e. the difference in diameter between the rivets measure under head before being heated and rivet hole shall not less than 0.75mm (1/32 inch). The shanks shall be made of a length sufficient to fill the hole thoroughly and to form the head.

**8.8.2** The rivets shall be at the proper heat and in no case shall one tip be hotter than the head. Rivet less than 10mm (3/8 inch) diameter may be driven cold. Flattened rivet heads may be used in certain places where clearance require them.

**8.8.3** Gauge for rivets, dimension and contours shall be provided by the contractor for the use of the inspecting officer.

**8.8.4** Before riveting is commenced all works shall be properly bolted up so that the sections riveted are in close contact throughout. Driven rivets when struck sharply on the head with a no grams riveting test hammer shall be free from movement and vibrations.

**8.8.5** Drifts may be used for drifting high members into position but their use on heavy members should be restricted securing them in their correct position. In no case shall drifting be allowed to such an extent that holes are distorted. Drifts steel shall be in accordance with relevant IS specification.

**8.8.6** All loose and burnt rivets and rivets with cracks badly formed, eccentric or deficient heads, shall be cut out and rivets shall also be cut out when required for the examination of work. The actual method of cutting out shall be approved by the Engineer. Re-cupping and caulking shall in no circumstances be resorted to.

**8.9 PAINTING:** No part of the work shall be painted until it has been finally inspected and approved by the Engineer/Inspecting Officer (I.O.)

#### **8.9.1 Painting contact surfaces before riveting**

**8.9.1.1** All steel work before riveting shall have the parts which will be in contact painted immediately before assembling on each surface with a heavy coat of red lead and pure raw linseed oil freshly ground and the surface brought into close contact while still wet paints and their ingredients shall comply with the following specification:-

- |      |   |               |
|------|---|---------------|
| i.   | IS specification of red lead for paints and jointing purposes                   | : IS 57 -1965 |
| ii.  | IS specification linseed raw and refined  | : IS 75-1965  |
| iii. | IS specification for linseed oil boiled for paints                              | : IS 77-1976  |
| iv.  | IS specification for ready mixed paints, brushing, red lead non setting priming | : IS 102-1962 |

**8.9.1.2** All parts shall be thoroughly cleaned and dried before they are painted, and when so specified all mild scale shall also be removed before painting.

**8.9.2 Painting rivets, bolts etc.:** All rivets, bolts, nuts, washers will have to be thoroughly cleaned and dipped in boiling linseed oil to be arranged by the contractor at his own cost, before using. No extra payment will be made on this account.

#### **8.10 Field rivets, bolts, nuts and service accessories**

**8.10.1** The work is to include supply of rivets, bolts, nuts washers etc. required to complete erection at site with allowance of waste. The contractor shall be responsible for supplying site rivets of correct length. The length of such rivets shall be verified by snapping a few rivets of each length in the presence of inspecting officer for examining whether the holes have been completely filled in by rivet materials.

**8.10.2** No structural steel for the manufacture of rivets, bolts etc. will be supplied by the Railway and no extra payment will be made to the contractor for supply of bolts, rivets etc.

**8.10.3** Service bolts and nuts, ordinary plates, washers and drifts etc. for use in the erection of the work shall also be arranged by the contractor at his own cost. On completion of the erection work, these would remain the property of the contractor.

#### **8.11 Assembly and erection**

**8.11.1** The contractor shall observe sufficient accuracy in the assembling and erection of every part of the work to ensure that all parts fit accurately together on erection.

**8.11.2** The contractor shall maintain a master steel tape of approved make for which he has to obtain a certificate of accuracy from the National Test House calibrated under a tension of 1.8 Kg. at 16.70 degree Celsius.

**8.12 Parts in contact:** All steel elements intended to be riveted or bolted together shall be in contact over the whole surface.

### **8.13 TEST CERTIFICATES**

**8.13.1** All materials for the work should pass tests or an analysis prescribed by the specifications mentioned above or to such other recommended specifications as the Railway shall have authorised as equivalent thereto or in the absence of such authorised specification such tests and analysis as to Railway shall specify.

**8.13.2** For raw materials like rivets and paints the contractor shall furnish copies of test certificates from the manufacturers, if any testing of materials is required by the Railway in respect of any other items this shall be arranged for by the Railway at its cost.

**8.13.3** Any approval given by the Railway in consequence of such tests or analysis shall in no way limit or interfere with the absolute right of the Railway to reject the whole or portion of such materials supplied, which in judgement of the Railway do not comply with the conditions of the contract. The decision of the Railway in this regard shall be final and conclusive for all purposes.

### **8.14 Method of measurement**

**8.14.1** For the purpose of payment, quoted rates apply to the weights of steel work calculated from final working drawing based on the critical weights given in the producers hand book only and using minimum square overall dimensions, no deductions being made for sqm, cuts, holes, or notches. Each gussets shall be on the dimension of the smallest enclosing rectangle, additional weight due to welding/rivet beams and bolts, nuts will not be considered for payment.

**8.14.2** The Drawing of Despatch Lists D.O.D.L.s when prepared according to the procedure enumerated in para above, are to be submitted by the contractor to the Railways for approval. Payment towards erection is to be made only on the quantities indicated in the approved D.O.D.L.s.

**8.14.3** Payment will be made based on measurement of approved fabricated materials under relevant items.

**8.14.4** Payment for steel (reinforcement) will be as per the reinforcement actually utilized in the work. No extra amount will be paid for wastage or for cut rods if any, which would be the property of the contractor. The weight of the steel will be calculated from the nominal or actual unit weight whichever is less.

**8.14.4.1** Cost of steel and Cement to be paid to the contractor under relevant Schedule is inclusive of transportation from source to site of work, loading, unloading, stacking, storing, all taxes, tools, plant, labour, re-handling from site go down to mixer, royalty, freight, incidental charges, Sheds for storage and Chowkidars etc.

**8.14.4.2** In respect of cement and reinforcement steel, the part payment will be limited to 75% of the quoted value of item brought to site in relevant items of Schedule "A1 & A2" contractor should furnish original cash bills for having purchased from authorized dealers and to be submitted to the Rlys.,

**8.14.5 Quantity:** If the tenderer makes use of any estimated quantity which may be given to him in the schedule or drawings or in any other way, he does so at his own risk and will not be entitled to make any claim or demand or to raise any question whatsoever on account of any error or any miscalculations in the said quantity.

## **9.0 AGGREGATE:**

**9.1** The aggregate shall conform to IS: 383 and shall before use be got tested through one of the approved testing institutions and the result submitted in accordance with Appendix A of IS 383.

**9.2** Coarse aggregate shall be crushed stone, angular in shape and gravel shall not be used. Coarse aggregate shall be tested for the followings (as per IS 2386):

- Determination of particle size and shape
- Estimation of organic impurities (as per IS 2386 - Part II)
- Surface moisture
- Determination of 10% fine value.

**9.3** Fine aggregates shall be resulting from natural disintegration of rock which has been deposited by streams or glacial agencies.

**9.4** The coarse aggregate, unless otherwise specified or authorized by the Engineer shall not be delivered to the site. All aggregates shall be protected from dust contamination by methods approved by and to the satisfaction of the Engineer or his representative.

**9.4.1** Aggregate which are not clean are to be washed to the satisfaction of the Engineer or his representative in water of quality. If the Engineer so directs, the contractor shall provide and operate a washing plant to ensure adequate supply of clean aggregates within the approved grading limit. All such washed aggregates shall be stored and drained for at least 24 hour before being used for concreting.

**9.4.2 Water for concrete and mortar:** Water shall be clean and free from injurious amount of deleterious materials. Normally portable water from an approved source may be considered satisfactory for washing aggregates, mixing and curing concrete, and shall comply with the provision of IS: 456.

**9.5.0 GENERAL:** The samples of all the materials proposed to be used by the contractor in the work shall be got tested by the contractor in an approved laboratory and necessary test certificates including manufacturers certificates of tests, proof sheets, mill sheets etc. showing that the materials have been tested in accordance with and conform to the requirements of the appropriate IS Codes or other relevant Standard Specifications or these specifications, shall be supplied in original free of charges on request to the Engineer or his representative.

**9.5.1** Samples of the following materials shall be submitted to the Engineer or his representatives free of charge for testing and approval.

- i. Coarse and fine aggregate,
- ii. Any other materials as directed by Engineer.

**9.5.2** Samples provided to the Engineer or his representatives for their retention are to be kept leveled boxes suitable for storage. Materials or workmanship not corresponding in character and quality with approved samples shall be rejected.

**9.5.3** Samples required for testing and approval must be supplied giving sufficient time to allow for such testing and approval, due allowance being made to the fact that if samples are rejected further samples shall be required. Delay to the works arising from the late submission of samples shall not be acceptable as a reason for delay in the completion of the work.

**9.5.4** The testing of the materials may be carried out by the Railway in any laboratory of its choice if required.

If the materials are not found to comply with the various provisions laid down in the relevant IS Codes, other relevant Standard Specifications or these specifications, the same shall be rejected irrespective of the test certificate submitted by the contractor.

**9.5.5** In addition the Engineer shall have the right to require the contractor at any time to draw samples of aggregates or any other materials from stock piles on the site or any other locations to be drawn in accordance with IS-2386 and tested in laboratory approved by the Engineer in accordance with the appropriate clause of IS: 2386 at the cost of the contractor.

**9.5.6** Tests for the determination of impurities in the sand shall be made once daily until the Engineer is satisfied that the specified compression strength is being regularly obtained, such tests shall be made once weekly and at other times as directed by the Engineer.

**9.5.7 Additional tests:** In addition to the tests required under clause hereof the Engineer or his representative may order tests to be carried out by an independent person appointed by him at such place or in such laboratory as he may determine in accordance with the appropriate clause of IS: 2386 or IS 2586 and the cost of such tests shall be borne by the contractor.

**9.5.8** The results of all such tests as described herein above and later or in succeeding paras shall be forwarded to the Engineer or his representative for his retention as record.

## **10.0 WATER**

**10.1** Water to be used in making and for curing concrete shall conform to IS: 456.

**10.2** The contractor shall arrange for water supply necessary for the work. Ordinarily, no water will be supplied by Railways to the Contractor either for drinking purpose or for execution of the work and the rate quoted shall include the cost of arranging water supply.



**10.3** However, if surplus water is available from a nearby Railway source, the contractor may be allowed to draw water for his work on payment of necessary water charges as fixed by the railway administration. Necessary arrangement of drawl of water by pumping, laying of pipeline and storage arrangement etc., shall be done by the contractor at his cost.

## **11.0 CONCRETE**

**11.1** The concrete shall be produced and laid in the manner as given in IRS Concrete Bridge Code 1997 (Second Revision) for General Bridge construction corrected up to date and IS 486.

**11.2** The concrete shall be of controlled quality with nominal maximum size of coarse aggregate limited to 20 mm unless specified otherwise in the schedule.

**11.3** Batching of different ingredients for production of concrete shall be done by weight only. A modern, mechanized or automatic weigh batcher shall be used for the weighing aggregates and cement. The accuracy of the measuring equipment shall be within +2 percent of the quantity of cement and mineral admixtures being measured and within +3 percent of the quantity of aggregate, chemical admixtures, and water being measured. Modern high-speed mixer or any other mixer approved by the Engineer shall be used for mixing concrete. The concrete shall be consolidated by means of vibration with approved type needle/form/surface vibrators.

**11.4** The contractor should submit concrete mix design before starting the work and obtain the approval by Engineer in charge / Dy.CE/WS/PER, Workshops/Perambur, Southern Railway before the execution of work. In case source of cement/type change, a new mix design shall be submitted for approval.

**11.5** The minimum grade of plain cement concrete shall be M 20 and that of Reinforcement and cement concrete shall be M25 unless specified otherwise in the tender schedule. Only approved design mix shall be used for the concrete.

**11.6** The minimum grade of concrete shall be M-40 for pre-tensioned pre-stressed concrete structure.

**11.7** The minimum quantity of cement to be used for various grades of concrete shall be as under:

- M20: 350 kg/cum ]
- M25: 400 kg/cum ] (with 43 grade cement)
- M30: 420 kg/cum ]

**11.8** Maximum water cement ratio: The limits for maximum water cement ratio for design mix shall be based on environmental conditions as per extant Railway Board's instructions. The limits for maximum water cement ratio for different environmental conditions shall be adopted as per Indian Railway Standard specification for Materials and Works 2010 (Vol. I & II) / Indian Railways Unified Standard Specifications (Formation Works, Bridge Works and P. Way Works) 2021/ Central Public Works Department Specifications 2019 Vol. I & II.

Maximum water-cement ratio			
Environment	Plain concrete(PCC)	Reinforced concrete(RCC)	Prestressed concrete (PSC)
Mild	0.55	0.45	0.40
Moderate	0.50	0.40	0.40
Severe	0.45	0.40	0.40
Verysevere	0.45	0.38	0.35
Extreme	0.40	0.35	0.35

**11.9** Samples from fresh concrete shall be drawn as required in IRS Concrete Bridge Code 1997 for bridge works and as per Indian Railway Standard specification for Materials and Works 2010 (Vol. I & II) / Indian Railways Unified Standard Specifications (Formation Works, Bridge Works and P. Way Works) 2021/ Central Public Works Department Specifications 2019 Vol. I & II as applicable. The test cubes should be cast at regular intervals and tested at regular intervals -7 days and 28 days respectively- assess the strength of concrete. The contractor should establish cube testing equipment at or near the site of work. The cost of casting of cubes and their testing will have to be borne by the contractor. In case the contractor desires to use a curing membrane instead of water curing, he may do so after submitting the necessary data and after the same is approved by the Engineer in charge.

**11.10** No extra payment on this account would be admissible. It should be noted that no additional payment would be made for curing/vibrating the concrete at different heights and the contractor should make his own arrangements for the provision of necessary staging/scaffolding etc and carry out curing/vibrating at all levels as directed by the Engineer in charge. If curing is not being done to a satisfactory standard, the Engineer may get it done at the contractor's cost without any notice to him as the curing cannot wait for any such notice time, etc. The Engineer's decision shall be final and binding as to whether satisfactory curing is being done or not. The cost of curing will be recovered from the 'ON ACCOUNT BILLS'.

**11.11** The water line and coarse aggregates shall be got chemically tested from time to time by the contractor at his cost for assuring proper quality as per required standards. The results in original shall be submitted to the Engineer in charge and approval obtained.

#### **11.12 Mixing of concrete**

**11.12.1** All concrete shall be mixed at site in a drum type mechanical mixer in first class working condition. Mixing shall be continued till materials are uniformly distributed and a uniform colour of the entire mass is obtained and each individual particle of the coarse aggregate shows complete coating of cement mortar. The mixing shall in no case be less than 2 minutes after all the ingredients have been put into the mixer.

**11.12.2** Mixer which have been out of use for more than 30 minutes shall be thoroughly cleaned before putting in a new batch. Mixing plant shall be thoroughly cleaned before and after use. A standby mixing plant equivalent to that in use shall be provided and maintained ready for immediate use during any break down.

**11.13 Ready Mixed Concrete (RMC):** Concrete produced by completely mixing cement, aggregates, admixtures, if any, and water at a Central Batching and Mixing plant and delivered in fresh condition at site of construction.

**11.13.1** Ready Mixed concrete may be used, wherever required. It shall conform to the specifications of concrete, as laid down in IRS Bridge Code, IS: 4926 (Specification for Ready Mixed Concrete) may be referred.

**11.13.2** Re-tempering with concrete: Under any circumstances, re-tempering i.e. addition of water after initial mixing, shall not be allowed, as it may affect the strength and other properties of concrete.

**11.13.3** Time period for delivery of concrete: The concrete shall be delivered completely to the site of work within 1½ Hr (when the atmospheric temperature is above 20 degree C) and within 2 Hrs (when the atmospheric temperature is at or below 20 degree C) of adding the mixing water to the dry mix of cement and aggregate or adding the cement to the aggregate, whichever is earlier. In case, location of site of construction is such that this time period is concerned inadequate, increased time period may be specified provided that properties of concrete have been tested after lapse of the proposed delivery period at the time of finalizing mix design.

**11.13.4** Transportation of ready mixed concrete: The ready mixed concrete shall be transported in concrete transit agitators conforming to IS: 5892 (Specification for concrete transit mixers and agitators). Agitating speed of the agitators during transit shall not be less than 2 revolutions per minute nor more than 6 revolutions per minute.

#### **11.14 Compressive strength of concrete**

**11.14.1** The compressive strength requirements for various grades of concrete shall be as given in table below:-

**Grade of concrete:** Compressive work test strength in N/mm sq. of 150mm cubes after mixing conducted in accordance with IDS: 516

	<b>Min. at 7 days</b>	<b>Min. at 28 days</b>
M 10 (Nominal mix. 1:3:6)	7.0	10
M 15 (Nominal mix 1:2:4)	10.0	15
M 20 (Nominal mix 1:12:3)	13.0	20
M25 (Controlled mix 1:1:2)	17.0	25
M 30 (Controlled mix)	20.0	30
M 40 (Controlled mix)	27.0	40
M 45 (Controlled mix)	30.0	45

**11.14.2** Where the strength of a concrete mix as indicated by tests, lies in between the strength of any two grades specified in table above, such concrete shall be classified for all purpose as concrete belonging to the lower of the two grades between which its strength lies.

**11.14.3** The contractor shall provide at his own expense all necessary labour, materials including cement moulds, equipment for sampling and all other ancillaries required in preparing specimens etc as given in para 11.14.1 and arrange to carry out test on these specimens in his own field laboratory. The contractor shall test these specimens in presence of the representative of the Engineer. Duplicate results shall be maintained under the joint signature of the contractor and the Engineer's representative. One set of the result being kept with the contractor and the other with the Engineer's representative.

**11.14.4** All work shall be carried out under the supervision of a qualified and competent Engineer: the contractor who shall supervise proportioning, placing and compacting of concrete at all stages.

**11.14.5** The Engineer reserves the right to take samples of concrete test cubes independently at his own discretion. The contractor shall provide all facilities at his own expense in preparation of such samples and concrete test tubes such as labour materials including concrete moulds, equipment for sampling and all other ancillaries required in their preparation. Contractor shall also arrange to transport these specimens to the laboratory selected by Railway at his own cost. Contractor shall depute representative during testing who shall sign the test results as a token of contractor's acceptance.

**11.15** When depositing concrete in very hot weather, precautions shall be taken so that the temperature of wet concrete does not exceed 40° C while placing. This shall be achieved by stacking aggregate under the shade and keeping them moist, using cold water, reducing the time between mixing and placing to the minimum, cooling formwork by sprinkling water, starting curing before concrete dries out and restricting concreting, as far as possible, to mornings and evenings.

**11.16** The plasticizer/retarder/admixture shall conform to IS:6925 & IS 9103. They should be chloride free and free and low in sulphate content. The contractor at his cost shall be test each lot of admixture. The use of admixture shall be made as per the manufacturer's guidelines. Prior approval of engineer is necessary for its uses.

**11.17 Durability of concrete:** The durability of concrete depends on its resistance to deterioration and the environment in which it is placed. The resistance of concrete to weathering, chemical attack, abrasion, frost and fire depends largely upon its quality and constituents materials. Susceptibility to corrosion of the steel is governed by the cover provided and the permeability of concrete. The cube crushing strength alone, is not a reliable guide to the quality and durability of concrete; it must also have an adequate cement content and a low water-cement ratio. The general environment to which the concrete will be exposed during its working life is classified in five levels of severity that is mild, moderate, severe, very-severe and extreme, as described below.

ENVIRONMENT	EXPOSURE CONDITION
Mild	Concrete surface protected against weather or aggressive conditions.
Moderate	Concrete surface sheltered from severe rain or freezing whilst wet concrete exposed to condensation, concrete structure continuously under water, concrete in contact with non-aggressive soil/ground water.
Severe	Concrete surface exposed to severe rain, alternate wetting and drying or occasional freezing or severe condensation. Concrete exposed to aggressive sub-soil/ground water or coastal environment
Very severe	Concrete surface exposed to sea water spray, corrosive fumes or severe freezing conditions whilst wet
Extreme	Concrete structure surfaces exposed to abrasive action surfaces of members in tidal zone.

### 11.18 MINIMUM GRADE OF CONCRETE

Environment	MINIMUM GRADE OF CONCRETE		
	Plain concrete (PCC)	Reinforced concrete (RCC)	Prestressed concrete (PSC)
Mild	M-20	M-25	M-35*
Moderate	M-25	M-30	M-35*
Severe	M-25	M-35	M-45
Very severe	M-30	M-40	M-50
Extreme	M-30	M-45	M-50

\* Minimum grade of concrete shall be M 40 for Pre-tensioned prestressed concrete structures

### 11.19 Transport, placing and compaction of concrete

**11.19.1** The method of transporting and placing concrete shall be approved by the Engineer or his representative. All concrete shall be so transported and placed that no contamination segregation or loss of its constituent materials takes place.

**11.19.2** All form work and reinforcement, contained in it shall be cleaned and made free from standing water, dust, snow or ice immediately before placing of concrete. No concrete shall be placed in any part of the structure until the approval of the Engineer or his representative has been obtained. Concrete shall be compacted in its final position within 30 minutes of its discharges from the mixer. Concrete when deposited shall have a temperature of not less than 4.5 degree C and not more than 38 degree C.

**11.19.3** Except when otherwise agreed to by the Engineer or his representative, concrete shall be deposited in horizontal layers to a compacted thickness of not more than 450 mm when internal vibrators are used and not exceeding 300 mm in all other cases. In no case concrete shall be allowed to be dropped from a height of more than 2 metres.

**11.19.4** When concrete is conveyed by chutes the plant shall be of such size and design so as to ensure practically continuous flow. Slope of the chute shall be so adjusted that the concrete flows without the use of excessive quantity of water and without segregation of its ingredients. The delivery and of chute

shall be as close as possible to the point of deposit. The chute shall be thoroughly flushed with water before and after each working period and the water used for this purpose shall be discharged outside the form work.

**11.19.5** All concrete shall be compacted to produce a dense homogeneous mass with the help of vibrators except in case of concrete poured under water, where vibrator cannot be used. To ensure thorough and properly compacted concrete the contractor shall carry out a necessary compacting factor tests at his own cost at such frequency and the value of compacting factor to be maintained as decided by the Engineer. The contractor shall have to carry out other tests like Penetrometer and Vee Bee Consistometer tests or any other tests as directed by the Engineer at his own cost. The Engineer, however, reserves the right to carry out such tests, independently at his own discretion. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of break-downs. Internal vibrators shall be capable of producing not less than 10,000 cycles per minute and external or form vibrator not less than 3,000 cycles per minute. Vibration shall not be applied through reinforcement, and where vibrators of the immersion type are used, contact with reinforcement and all inserts shall be avoided as far as practicable.

**11.19.6** If in the opinion of the Engineer, the pockets/honey combs in the structure are found to an extent or character as to affect the strength of the structure materially or endanger the life of reinforcement, he may declare such concrete defective and order for its removal and replacement at expense of the contractor.

## **11.20 CURING**

**11.20.1** All concrete shall be protected immediately after compaction and during hardening from harmful effects of rain, funning water, sunshine, frost and driving winds, shocks, vibrations, traffic and rapid temperature changes. All exposed faces of concrete shall be kept continuously wet by apply water or covering with wet sacking, hessian etc. for a period of not less than 14 days from the date deposition.

## **12.0 DEVIATION FROM THE SPECIFICATION**

**12.1** Should the tenderer desire to depart in any respect from the provisions in this special specification, he must specifically bring the matter to notice, in his tender in the form of a covering letter explaining in detailed such departure he proposes to make from the specification. Manufacture's standard specification may be submitted but all discrepancies must be carefully drawn: attention to both in the covering letter and in the appendices to be annexed to the specification, showing the deviation.

**12.2** Should it be considered necessary to alter any details of the design after letting out the contract, such adjustment of contract price shall be made by the Engineer as may be considered suitable and reasonable and such alteration shall be carried out by the tenderer to the entire satisfaction of the Engineer or the Inspecting officer.

### **13.0. FORM WORK**

**13.1** The term form work includes all temporary or permanent form essential for forming the concrete, together with all temporary construction props, bracings required for the support. In general the erection and removal of form work shall be in accordance with the provision given under clause 9 of I.R.S. Concrete Bridge Code (April, 1982 edition).

**13.2** Form work be made of either metal or timber and shall conform to the shapes, lines, and dimensions shown in the drawings and shall be so constructed and supported as to remain sufficiently rigid and watertight to prevent loss of mortar and water from the concrete and shall be able to carry all the loads and forces during the casting as well as later.

**13.3** For important works, steel shuttering with tubular steel centering shall be used in accordance with the manufacturer's/designer's instructions.

**13.4** All panel joints, corners, and seams should be made watertight by using approved sealing materials. Also, the steel form should be thoroughly cleaned before use.

**13.5** Form faces should be treated with releasing agent to prevent concrete sticking to the forms and thereby aid in stripping. Only approved type of releasing agent with prior permission of the Engineer in charge shall be used. Use of black oil or grease is totally prohibited.

**13.6** Ample access should be provided within the form work for proper cleaning up, placement, consolidation, and inspection of concrete.

**13.7** Forms shall be mortar tight and shall be made sufficiently rigid by the use of ties and bracing to prevent any displacement, deflection or movement of any kind. They shall be strong enough to withstand of the construction, all pressure, ramming and vibration, movement of persons, materials and plant during and after placing the concrete. Special measures shall be taken to ensure that the form work does not hinder the shrinkage of concrete because without this cracking could occur before the form work is removed.

**13.8** When the forms are ready for commencing concreting, the contractor shall inform the Engineer or his representative to inspect and accept the forms as to their strength, alignment and general fitness. Being satisfied with the form work Engineer then may allow the contractor for curing concrete but such inspection and permission shall not relieve the contractor of his responsibility for safety of men, machinery, materials and for results obtained.

**13.9** The formwork should be robust and strong and the joints should be leak-proof. The staging, scaffolding and shuttering are required to be properly designed so that their erection as well as striking can be conveniently done. The design should also ensure that at the time of striking, the concrete does not get disturbed and the forms are conveniently removed. For this, wooden or other type of packing should be designed and placed in position for easy removal of the form work.

**13.10** The contractor shall be entirely responsible for the adequacy and safety for form work not withstanding any approval or review by the Engineer of his drawing and design.

**13.11** If proprietary system of formwork is used, a detailed information as per shall be furnished to the Engineer for approval.

**13.12** Number of joints in the formwork should be kept minimum in both directions - horizontal and vertical - by using large size panels. The design should provide for proper "soldier" to facilitate alignment to the required degree. All joints must be properly sealed. Use of PVC joints sealing tapes, foam rubber or PVC T-Section is essential to prevent leakage of grout.

**13.13** Bally should not be used as staging. Staging must have cross bracing and diagonal bracing in both directions.

**13.14** Where centering or launching trusses are adopted for casting of superstructure, the joints of the centering trusses, whether welded, riveted or bolted should be thoroughly checked before proceeding with the concreting. Also, various members of the centering trusses should be examined for proper alignment and unintended deformation before proceeding with the concreting.

**13.15** For distribution of load and load transfer to the ground through staging, an appropriately designed base plate must be provided which shall rest on firm sub-stratum. Water used for curing should not be allowed to stagnate near the base plates supporting the staging and should be properly drained.

**13.16** The design of false work should be such as to facilitate proper and safe access to all parts for inspection.

**13.17** Removal of the form should be planned as a part of the total formwork design. For piers taller than 30 meters, slip forming, shall be preferred.

**13.18** The chamfers, beveled edges and mouldings shall be made in the formwork itself. Opening for fixtures and other fittings connected with service shall be provided in the shuttering as directed by Engineer.

**13.19** As far as practicable, clamps shall be used to hold the forms together. Where use of nails is unavoidable minimum number of nails shall be used and these shall be left projecting so that they can be easily withdrawn. Use of double headed nails shall be preferred.

**13.20** The formwork shall be made so as produce a finished concrete true to shape, line levels, plumb and dimensions as shown on the drawing, subject to the following tolerance unless otherwise specified in these documents or drawings or as directed by the Engineer.

(a)	Sectional dimension	5mm or 2% of dimension whichever is less
(b)	Plumb	± 1 in 1000 of height
(c)	Levels	± 3 mm before any deflection has taken place.



**13.21** Tolerance given above are specified for local aberration in the finished concrete surface and structure taken as a whole or for the setting and alignment of formwork, which should be as accurate as possible to the entire satisfaction of the Engineer.

**13.22** The formwork shall be so removed as not to cause any damage to concrete. Centering shall be gradually and uniformly lowered in such a manner as to avoid any shock or vibration. Supports shall be removed in such a manner as to permit the concrete to take stresses due to its own weight uniformly and gradually.

**13.23** The whole of the formwork removal should be planned and a definite scheme of operation worked out.

**13.24** In no circumstances should forms be struck until the concrete reaches a strength of at least twice the stress to which the concrete may be subjected at the time of striking but not before the period as mentioned in IS: 466, where ordinary Portland cement is used.

**13.25** Where possible the formwork should be left as long as it would assist curing. Form should be eased carefully in order to prevent the load being suddenly transferred in order to avoid shock or vibration. The Engineer shall be informed in advance by the Contractor of his intention of striking any formwork and the prior approval of Engineer shall be taken.

**13.26** In all types of formwork to form finished exposed concrete, only non-staining mould oil supplied by an approved manufacturer shall be used.

**13.27** The repetitive usages of the same formwork to cast form finished exposed concrete shall be as decided by the Engineer and in no case the formwork not guaranteed to produce the required form finish to the satisfaction of the Engineer shall be used.

**13.28** The exposed concrete shall have uniform finish. The finish of the concrete when shuttering and formwork are removed will generally be without any blemish and will not require touch up. Slight touch up for a small spot or two if necessary shall be carried out expertly so as to be harmonious with the entire surface.

### **13.29 Removal of form work**

**13.29.1** The consent of Engineer or his representative shall be obtained in all cases before removing any form work but such permission shall not relieve the contractor of his responsibility in respect of an, injury or damage to the concrete work arising from the removal of the forms.

**13.29.2** Forms shall be so constructed and fitted as to be removable in sections in the desired sequence without damaging the surface of concrete or disturbing other sections.

**13.29.3** Due consideration shall be given to the local conditions, character of structure, the weather climate and temperature and other conditions that influence the setting of concrete before removal of form work.

**13.29.4** Where internal metal ties are permitted, they shall be extracted or cut without causing any damage to concrete and remaining holes filled with mortar. No permanently embedded metal part shall have less than 25 mm clear cover to the finished concrete surface. The contractor shall make good, at his own expense, any injury or damage to the concrete work arising from removal and striking of forms and supports.

**13.29.5** The form works shall be cleaned and made good to the satisfaction of the Engineer before reuse. The cost of all form work shall be deemed to have been included in the rate for cement concrete items of work and shall not be paid separately.

#### **14.0 CONSTRUCTION JOINTS**

**14.1** The surface of the construction joints should be cleaned properly and prepared so as to ensure adequate bond with the concrete placed below or adjacent to it and to obtain the required water tightness. Any approved method of cleaning for removal of laitance, bleed water, and fines by using wire brush, water jetting, green cutting, and sand blasting may be used with the prior approval of the Engineer in charge. Concreting shall be carried out continuously up to construction joints. The position and arrangement of construction joints shall be as shown in the structural drawings or as directed by the Engineer-in-Charge. The number of such joints shall be kept minimum. Joints shall be kept as straight as possible. Construction joints should comply with IS 11817.

**14.2** All construction joints horizontal or vertical shall be at predetermined position according approved drawing or as directed by the Engineer. Prior to commencement of fresh concreting over any construction joint which has set but not hardened, the removal of laitance and roughening shall be done wire brushing and washing and care shall be taken to avoid dislodgement of coarse aggregates.

**14.3** At construction joints where the concrete has set, any skin or laitance shall be thoroughly hacked, swept cleaned and washed with clean fresh water. The surplus water shall be removed immediately before depositing fresh concrete. The neat cement, grout shall be followed by 13mm thick layer of cement mortar of same proportion as in concrete and the concreting resumed immediately thereafter. The first batch of fresh concrete shall be forced hard on to the mortar layer and the set face angles and corners by means of compacting tools, vibrators etc. and the damping effect on vibration such position shall be allowed for.

**14.4** Construction joints shall be avoided as far as possible in case of structure, specially at tension zones. Where unavoidable, concreting shall be carried out continuously up to such joints which shall preferably be transverse to the line of main compression. However, in all cases, the position of construction joints shall be predetermined and got approved by the Engineer.

**15.0** Samples of all fittings and fastenings including locking arrangements of approved quality required for doors, windows, and ventilators as well as all sanitary and water supply fittings, etc., should be submitted to the Engineer in charge and used in the work only after his specific approval. Approved samples should be deposited with the Engineer in charge.

## **16.0 SUBMISSION OF DOCUMENTS BY THE CONTRACTOR**

### **16.1 PROGRAMME OF WORK**

**16.1.1** Immediately on issue of letter of acceptance of this tender, the contractor should submit a programme of work showing the activities work wise for completing the whole work within the stipulated period of completion in consultation with the Executive Engineer in charge of the work. If so desired by the Engineer, the contractor shall submit further programme from time to time, taking into consideration the latest progress achieved till then. This is to reiterate that the railway reserves the right of terminating the contract, at any stage of review of the progress under (a) above, if the above agreed programmes are not adhered to within the margin of 10% as envisaged in Clause 62(1) (Viii) of the General conditions of track.

**16.1.2** Non submission of the programme as envisaged in above shall entitle Railway to terminate the contract as per Clause 62 of the General conditions of contract.

**16.1.3** The contractor has to submit concrete mix design and get it approved by the Engineer in charge before execution of work. The cement consumption quantity will be paid based on approved design mix or actual whichever is less.

### **16.2 Progress of work**

**16.2.1** The contractor shall submit to the Engineer a monthly report giving progress of works by the third of the following month.

**16.2.2** It shall be ensured that the works are carried out according to the agreed programme and no changes are made except with the prior approval or at the instance of the Engineer.

**16.2.3** The contractor shall participate in periodical meetings with the Engineer to review the progress of the work. In case a slippage in the time schedule due to the contractor's inability to perform as per agreed programme, the contractor shall take such action as may be necessary to bring back his work to schedule without additional cost to the Railway, either by employing over time operations, increasing the number of shifts, capacity of construction plants, or as directed by the Engineer.

**16.2.4** The contractor shall immediately inform the Engineer whenever there is or is likely to be any change in the schedule.

**16.2.5** The contractor shall carry out modifications in the procedure of work, if found necessary, as directed by Engineer during inspection. Works falling short of quality shall be rectified or replaced if necessary by the contractor at his own cost as directed by the Engineer.

**16.2 Modification of drawings:** The Railway reserves the right to alter/modify the drawings/design to suit the site conditions. If due to the change in drawings or designs there is any increase or decrease in quantities in the items of the schedule, payment shall be made only for the actual quantities executed at the accepted rates. If there is sufficient ground for granting extension of the date of completion on this

account, the Railway will consider such request on the merits of each individual case. Such circumstances shall in no way affect or vitiate the contract or alter the character thereof or entitle contractor to damages or compensation thereof.

**16.3 Fixing milestones:** The concerned Executive Engineer-in-charge of the work may fix appropriate milestones and monitor.

## **17.0 SUPPLY OF MATERIALS**

**17.1** The materials that are to be supplied and used for the work by the contractor should be as per the relevant I.S. codes and should be got approved by the Engineer in charge before use/procurement.

**17.2** Materials shall be tested before leaving the manufacturer's premises, where appropriate. Materials may as well be tested on the site and they may be rejected if found not suitable or not in accordance with the specifications notwithstanding the results of tests at manufacturer's works or elsewhere or test certificates.

**17.3** To ensure quality control, test certificates from the manufactures should be produced by the contractors which should conform to the relevant specifications (latest may be incorporated).

**17.4** All raw materials shall be obtained from recognized producers or their authorized representatives and the contractor shall submit Test Certificates for the materials so obtained to the satisfaction of the Railway.

**17.5** Railways may also take samples during the course of work and get the cement and to steel tested ascertain their conformity to specifications.

**17.6** The Engineer or his representative shall have the right to order at any time, that any aggregate or other construction materials which do not meet with his approval shall not be used in the works and such rejected materials shall be removed from the site by the contractor at his own expenses notwithstanding any prior approval which might have been given earlier.

**17.7** In case of default on the part of the contractor in removing rejected materials within the time specified in notice, the Engineer shall be at liberty to have them removed by other means at the cost of the contractor.

**17.8** If there is any delay on the part of the Railway in supplying materials which the Railway has undertaken to supply as above and if as a result thereof the completion of the work is delayed, the Railway will consider on specific request by the Contractor granting suitable extension of completion date for such loss of time. The Railway will however, not entertain any claim from the contractor on this regard due to any loss suffered by him on account of his labour or any other account as a result of delay in supply of materials.

**17.9** Any approval given by the Railway in consequence of such tests or analysis shall in no way limit or interfere with the absolute right of the Railway to reject the whole or portion of such materials supplied,

which in the judgment of the Railway do not comply with the conditions of contract. The decision of the Railway in this regard shall be final and conclusive for all purpose.

## **18.0 TESTING OF SAMPLES**

**18.1** For testing of samples of soil, soil mix, granular material mix, bituminous mix, aggregates, cores, tiles, stone, bricks, timber, paints, admixtures, water and other building materials, samples in the required quantities and form shall be supplied to Engineer by the contractor at his own cost.

**18.2** For cement, bitumen, mild steel, castings, pipes, bearings and other similar materials for which essential tests are to be carried out at the manufacturer's plants or at laboratories other than the site laboratory, the cost of samples, sampling, testing and the furnishing of test certificates shall be borne by the contractor. Contractor shall also furnish test certificates to Engineer.

**18.3** Testing of this material shall be done by the contractor at approved laboratories as directed by the Engineer-in-charge.

**18.4** Cost of testing has to be borne by the contractor at his own cost. Rates quoted by the contractor are inclusive of above testing charges.

## **19.0 TRANSPORTATION OF MATERIALS**

**19.1** The contractor should make his own arrangements for the reqd. vehicles, earth moving equipments, underground drainage cleaning/silt cleaning equipments and other tools and plants during the execution of work.

**19.2 Service roads:** The Railway does not undertake to provide any service roads for the movement of the contractor's vehicles. The contractor can however make use of the service roads, wherever they exist free of charge.

## **20.0 STORAGE OF MATERIALS**

**20.1** Any temporary structure required for storage of cement and steel has to be provided by the tenderer at his own cost. This will be removed after completion of the work. Railway will only provide suitable land for construction of the temporary shed free of cost if feasible. A double lock arrangement (contractor and Railway) for the temporary store site should be provided.

**20.2** The contractor shall provide at his own cost suitable storage arrangement for cement and steel to the satisfaction of the Engineer and the Engineer or his representative shall have the authority at all times to inspect the storage arrangement and contractor shall provide all facilities for inspection and check of materials. For the materials supplied by the Railway the Contractor shall at all times maintain proper records showing the basis of the indent, the receipts and utilisation of the materials and these shall at all times be opened for inspection by the Engineer or his representative.

**20.3** For stacking cement the contractor shall at his own cost build suitable damp proof godowns at the site of work and make all satisfactory storing arrangements to see that the strength of cement is not deteriorated.

**20.4** The storage capacity for cement shall be for not less than 30 days requirement of cement for the work on hand and anticipated at the time at the rate of progress of work. The arrangement for storage shall be such as to ensure that utilization of cement is in order of its arrival at the stores.

**20.5** All materials to be used in permanent works shall be stored on rocks, supports, stock piles in bins under cover etc. as appropriate, to prevent deterioration or damage from any cause whatsoever to the satisfaction of the Engineer or his representative.

**20.6** The contractor shall at all times maintain on the site such quantities of each type of aggregates as are considered by the Engineer or his representative to be sufficient to ensure continuity of works.

**20.7** Each type and grading of aggregate shall be stored in separate stacks on a hard floor having sufficient slope to ensure adequate drainage of surplus water. Wet and washed aggregate shall be kept in storage for at least 24 hours to ensure adequate drainage before being used for concreting.

## **21.0 TOOLS AND PLANTS.**

**21.1 Supply of railway plant, machinery etc.:** Railway is not bound for supply of any plants, machinery etc., required for the work. The contractor has to make his own arrangements for supply of requisite number of plants, machinery etc.

**21.2** All construction plants, temporary works and materials provided by the contractor shall when brought to the site be deemed to be exclusively intended for the construction and completion of the work and the contractor shall not remove the same or any part thereof (save for this purpose of moving it from one part of the site to another) without the consent in writing of the Engineer.

**21.3** On completion of the work, the contractor shall remove from the site all the said construction plants and temporary works remaining thereon and any unutilized materials provided by the contractor.

**21.4** The Railway shall not at any time be liable for the loss of injury to any of the said construction plant, temporary works or materials save as otherwise provided in these documents.

**21.5** The contractor shall make his own arrangement for all construction plants and equipment, tools including spare parts, fuel and consumable stores and all labour required to ensure efficient and methodical execution of the work. The quoted rates shall be inclusive of all charges as such items.

## **22.0 INSPECTION OF MATERIALS & SITE**

**22.1** The railway will have the right to check the quality of any material required for construction like cement, sand, coarse aggregate, bricks, timber and concrete cubes etc for its conformity with specification. The testing charges will have to be borne by the contractor. Sufficient cube moulds will have to be supplied by the contractor at his own cost.

**22.2** Railway Officials concerned with the contract shall have powers at any time to inspect and examine any part of the works and the contractor shall give such facilities as may be required for such inspection and examination.

**22.3** Wherever the Engineer or his representative gives notice to the contractor that materials are to be inspected off the site, the contractor shall, having regard to the location of the materials and the nature of the inspection, test or examination required, give to the Engineer or his representative at least one week's notice of such materials being ready for inspection, test or examination.

**22.3.1** Delay to works arising from the late submission of such notice will not be acceptable as reason for delay in the completion.

**22.4** The Engineer reserves the right to reject the whole or part of work executed, which in his judgment does not comply with the requirements of the specifications. The decision of the Engineer shall be final and conclusive in this matter for all purposes.

**22.5** No work shall be covered up or put out of view without the approval of the Engineer or his authorised representative and the contractor shall accord full opportunity for examination and measurement of any work which is about to be covered up or put out of view and for examination of foundations before permanent work is put thereon. The contractor shall give 7 day notice to the Engineer or his representative whenever any such work of foundation is ready for examination and the Engineer or his authorised representative shall within reasonable time, unless he considers it unnecessary and advises the contractor accordingly, attend for the purpose of examination and measurement of such foundations. In the event of failure of the contractor to give such notice he shall, if required by the Engineer, uncover such work at contractor's expense.

**22.6** The contractor shall uncover any part of work and or make openings in or through the same as the Engineer may from time to time direct for his verification and shall reinstate and make good such part to the satisfaction of the Engineer at his own cost.

**22.7** All works embracing more than one process shall be subject to examination and approval by the Engineer at each stage thereof and the contractor shall give due notice to the Engineer or the authorised representative when such state is ready. In default of such notice, the Engineer shall be entitled to appraise the quantity and extent thereof, even at a later stage at the risk and cost of the contractor.

**22.8** The contractor should disclose the source from where supplies of cement and steel after received by him and shall maintain a detailed record of receipt of cement and steel from different sources and shall keep the challan, invoice, lorry No. etc., and shall enter the receipts, issues and store balance in a Register as directed by the Engineer-in-charge and produce the same to the Engineer as and when demanded. Railway reserves the rights to inspect the contractor's godowns and documents pertaining to this work. The contractor shall use these materials in the work as per Rly's specifications/approved drawings and shall not use the quantities than what is stipulated in the relevant specifications/approved drawings. The copy of invoice of steel and cement should be submitted to the Rly. for their record.

**22.9** For accountal of steel reinforcement, reinforcement register will be maintained by the Railway for entering the details, such as description of the reinforcement, Nos., cut length, total lengths, diameter of the bar, weight per RMT, total weight etc. The above details are to be entered by the concerned Jr. Engineer/works) / Section Engineer (Works) and the contractor should sign the register as a token of acceptance of the details entered by Jr. Engineer/ Section Engineer of Railway.

## **22.8 Removal of defective works**

**22.8.1** If in the opinion of the Engineer, any of the works had been executed with improper materials or defective workmanship, the contractor when required by the Engineer, shall re- execute the same and substitute proper materials and workmanship forthwith at his own cost and in case of default of contractor in so doing within a week; the Engineer shall have full power to employ other persons to execute the work and the cost thereof shall be borne by the contractor.

**22.8.2** All materials which Engineer or his representative has determined as not conforming to requirement of the contract will be rejected, whether in place or not. They shall be removed immediately from site as directed. Materials, which have been found defective and which have been subsequently corrected shall not be used in the work unless approval is accorded in writing by Engineer. Upon failure of the contractor to comply with any order of Engineer/ his representative given under this clause. Engineer/ his representative shall have authority to cause the removal of rejected material and to recover the removal cost thereof from any money due to the contractor.

**22.9** Any excess quantity of cement and steel left over after completion of the work will have to be disposed of by the contractor and cannot be taken over by the Railway.

**23.0** The bonded labour system (Abolition) ordinance 1975 would apply to the present contract. The contractor shall duly observe the provisions thereof.

**23.1** In terms of provisions of new Clause 26.A to the General Conditions of Contract (GCC), the contractor shall also employ the following Qualified Engineers during execution of the allotted work:

- (a) One qualified Graduate Engineer when cost of work to be executed is Rs. 200 lakh and above, and
- (b) One qualified Diploma Holder Engineer when cost of work to be executed is more than Rs. 25 lakhs, but less than Rs. 200 lakhs.

**23.2** Further, in case the contractor fails to employ the qualified engineer, in terms of provisions of clause 26A.2 to the General Conditions of Contract, shall be liable to pay an amount of Rs. 40,000/- in case of failure to employ a qualified Graduate Engineer when required and Rs. 25,000/- for failure to employ a qualified Diploma Holder Engineer when required for each month or part thereof for the default period for the provisions, as contained in Para 23.1 (a) & (b) above respectively.

**23.3** Provisions for deployment of qualified engineers (Graduate Engineer or Diploma Holder Engineer) shall be for the values as prescribed above. However, for the works contract tenders, if it is considered appropriate by the tender inviting authority, not to have the services of qualified engineer, the same



shall be so mentioned in the tender documents by the concerned Executive with the approval of officer not below the level of SAG officer, for reasons to be recorded in writing.

#### **23.4 Clause 26 to GCC- Provision Of Efficient And Competent Staff At Work Sites By The Contractor:**

**23.4.1** The Contractor shall place and keep on the works at all times efficient and competent staff to give the necessary directions to his workmen and to see that they execute their work in sound & proper manner and shall employ only such supervisors, workmen & labourers in or about the execution of any of these works as are careful and skilled in the various trades.

**23.4.2** The Contractor shall at once remove from the works any agents, permitted subcontractor, supervisor, workman or labourer who shall be objected to by the Engineer and if and whenever required by the Engineer, he shall submit a correct return showing the names of all staff and workmen employed by him.

**23.4.3** In the event of the Engineer being of the opinion that the Contractor is not employing on the works a sufficient number of staff and workmen as is necessary for proper completion of the works within the time prescribed, the Contractor shall forthwith on receiving intimation to this effect deploy the additional number of staff and labour as specified by the Engineer within seven days of being so required and failure on the part of the Contractor to comply with such instructions will entitle the Railway to rescind the contract under Clause 62 of these conditions.

#### **23.5 Clause 26A to GCC- Deployment Of Qualified Engineers At Work Sites By The Contractor:**

**23.5.1** The contractor shall also employ Qualified Graduate Engineer or Qualified Diploma Holder Engineer, based on value of contract, as may be prescribed by the Ministry of Railways through separate instructions from time to time.

**23.5.2** In case the contractor fails to employ the Engineer, as aforesaid in Para 23.5.1, he shall be liable to pay penalty at the rates, as may be prescribed by the Ministry of Railways through separate instructions from time to time for the default period for the provisions, as contained in Para 23.5.1.

{Authority : Railway Board's letter no. 2012/CE-I/CT/O/20, New Delhi, Dated 10.05.2013}

**23.5.3** The decision of the Engineer in charge as to the period for which the required technical staff is to be employed by the contractor and as to the reasonableness of the amount to be deducted on this account shall be final and binding on the contractor.

#### **24.0 ANTI-MALARIA PRECAUTIONS.**

**24.1** Every precaution shall be taken by the contractor to prevent the breeding of mosquitoes at the site of work during construction and all reacceptance used for the storage of water must be suitably protected for this purpose or must be emptied at the close of the work every day. As a precautionary measure against Malaria all water used for curing concrete and masonry works must contain saponified

creosol in solution which must not be less than 1:200 or more than 1:100 so that the solution will have markedly cloudy appearance and will give a reasonably strong odour.

**24.2** As a precaution to any measure against Malaria the contractor will be responsible to take up anti-larval work at his own expense during the currency of the contract. In case of contractor's failure to undertake the job, the expenditure incurred if any by the Railway on this account is recoverable from the defaulting contractor without any reference.

**24.3** The contractor shall be responsible for anti larval work at his cost during progress of work as may be prescribed by the Engineer in charge on the advice of the Rly. Medical Authority and where the use of insecticides is involved it shall be made in accordance with the provision of the act and rules in this behalf at the cost of the contractor who shall also be solely responsible for any acts of omissions under the provision of the aforesaid rules.

## **25. TAX**

**25.1. INCOME TAX:** Income tax will be deducted at 2% (two percent) and also surcharge if any at source from each bill, unless otherwise authorized by Income Tax Department.

**25.2 GST (Goods and Service Tax):** The contractor is liable to pay GST (Goods and Service Tax) applicable from 01.07.2017. The Contractor is requested to submit their "GSTIN" Registration number © Modification to para (a) of clause 6, part-I of Indian Railways Standard General Conditions of contract. In case if the contractor is not liable to be registered under GST Act, the Railway reserves right to deduct the applicable GST for his/her contract bills under the provision of GST Act -2017.

## **26.0 Other instructions to tenderer or contractor**

**26.1** Payments as specified in the schedules will alone be admissible. No site installation charges will be payable and the tenders with such conditions are liable to be rejected.

**26.2** Stones, metal, sand etc. of approved quality shall be collected from outside Railway limits as per the nomenclature of the items of work and the contractor shall pay all seigniorage and other incidental charges may be involved.

**26.3** Any obstructions such as service lines, water pipe lines, cables, sewerages etc. met with during the progress of the work should immediately be reported to the Engineer in charge.

**26.4** Temporary/permanent arrangements for maintaining continuous flow through the sewer/water mains will have to be made by the Contractor if the existing mains are affected during execution of foundations, duly realigning the sewer/water mains with contractor's own cost. However, for underground cables etc. encountered while excavation of the same shall be got done through separate agencies or departmentally by the Railways.

**26.5** The works should be carried out without any interference to the normal working of the railway track and structures.

**26.6** The contractor shall be responsible for any loss/damage to railway and public property or third party's if it occurs during the course of execution and the Rly. Reserves its right to have the damages made good by the contractor.

**26.7** The contractor must ensure the safety of labourers engaged by him during the course of execution of work and/or while crossing the track and the railway will not be responsible for any injury sustained by the labourers or for any fatal accident and the contractor should bear all the expenditure involved.

**26.8** The rate quoted by the tenderer shall be inclusive of any of additional labour etc. for leading the materials across running tracks and no extra rate shall be paid for the same unless otherwise specified.

**26.8.1** No extra payment will be made for lift/descent while loading / unloading and stacking of the materials.

**26.9** All materials shall be stacked sufficiently clear of the tracks and shall remain without any possibility of infringing the minimum fixed structure dimensions. Materials shall also not be unloaded or stacked over signal wires, cables or other gear or any such items to avoid interference to the existing running tracks.

**26.10** The contractor will also be held responsible for any accident or loss or damage or detention to trains caused due to such lapses on the part of contractor during the course of work as observed and decided by the Inspector in charge.

**26.11** The decision of the engineer as to the period for which the required key personnel labour were not employed by the Contractor and as to the reasonableness of the amount to be deducted on this account shall be final and binding on the Contractor.

**26.12 Liability of contractor(s) for any damage sustained by railway during accidents etc. caused due to contractor(s) failures, fault or negligence.**

**26.12.1** Railway will post an Engineer-in-Charge who may be Section Engineer (P.way) of any grade at site for technical supervision of the work. This Engineer-in-charge will be responsible for the safety of traffic. The work shall be executed by the contractor in a workman like manner to the satisfaction of the Engineer-in-charge. The contractor and his labour shall be guided by the instructions of the Engineer-in-charge. In the event of any accident occurring at the work site and if it is established during the departmental inquiry by the Railway or by the Statutory inquiry of CRS, that the accident occurred wholly or partly due to any act amounting to negligence on the part of the contractor or his labour in not adhering to the instruction of the Engineer-in-charge, the contractor shall render himself liable for damage and also legal prosecution if loss of life is involved.

## **27. VARIATION IN QUANTITIES:**

New clause 42(3) to Indian Railways General Conditions of Contract

(Ref: Item -9 to Railway Board's letter no. 2007/CE-I/18 DATED 28.09.2007; Item -2 to letter no. 2007/CE-I/CT/18 Pt. XII dated 31.12.2010)

The procedure detailed below shall be adopted for dealing with variations in quantities during execution of works contracts:

(i) Individual NS items in contracts shall be operated with variation of plus or minus 25% and payment would be made as per the agreement rate. For this, no finance concurrence would be required.

(ii) In case an increase in quantity of an individual item by more than 25% of the agreement quantity is considered unavoidable, the same shall be got executed by floating a fresh tender. If floating a fresh tender for operating that item is considered not practicable, quantity of that item may be operated in excess of 125% of the agreement quantity subject to the following conditions:

- (a) Operation of an item by more than 125% of the agreement quantity needs the approval of an officer of the rank not less than S.A. Grade:
- (b) Quantities operated in excess of 125% but upto 140% of the agreement quantity of the concerned item, shall be paid at 98% of the rate awarded for that item in that particular tender.
- (c) Quantities operated in excess of 140% but upto 150% of the agreement Quantity of the concerned item, shall be paid at 96% of the rate awarded for that item in that particular tender.
- (d) Variation in quantities of individual items beyond 150% will be prohibited and would be permitted only in exceptional unavoidable circumstances with the concurrence of associate finance and shall be paid at 96% of the rate awarded for that item in that particular tender.

(iii) Variation to quantities of Minor Value Item: The limit for varying quantities for minor value items shall be 100% (as against 25% prescribed for other items). A minor value item for this purpose is defined as an item whose original agreement value is less than 1% of the total original agreement value.

- (a) Quantities operated upto and including 100% of the agreement quantity of the concerned minor value item, shall be paid at the rate awarded for that item in that particular tender;
- (b) Quantities operated in excess of 100% but upto 200% of the agreement quantity of the concerned minor value item, shall be paid at 98% of the rate awarded for that item in that particular tender;
- (c) Variation in quantities of individual minor value item beyond 200% will be avoided and would be permitted only in exceptional unavoidable circumstances and shall be paid at 96% of the rate awarded for that item in that particular tender.

(iv) The variation in quantities as per the above formula will apply only to the Individual items of the contract and not on the overall contract value.

(v) Execution of quantities beyond 150% of the overall agreemental value should not be permitted and, if found necessary, should be only through fresh tenders or by negotiating with existing contractor, with prior personal concurrence of FA & CAO and approval of General Manager.

(vi) In cases where decrease is involved during execution of contract: The Contract signing authority can decrease the items upto 25% of individual item without finance concurrence.

(vii) For decrease beyond 25% for individual items of 25% of contract agreement value, the approval of an officer not less than rank of S.A. Grade may be taken, after obtained 'No Claim Certificate' form the contractor and with finance concurrence, giving detailed reasons for each such decrease in the quantities.

(viii) It should be certified that the work proposed to be reduced will not be required in the same work.

(ix) No such quantity variation limit shall apply for foundation items.

(x) As far as USSOR 2021/ DSR rates 2021 Vol I & II items are concerned the limit of 25% would apply to the value of USSOR 2021 /CPWD DSR rates 2021 Vol I & II schedule as a whole and not an individual USSOR 2021/CPWD DSR rates 2021 Vol I & II items. However, in case of NS items, the limit of 25% would apply on the individual items irrespective of the manner of quoting the rates (single percentage rate or individual item rate).

(xi) For the tenders accepted at Zonal Railways level, variations in the quantities will be approved by the authority in whose powers revised value of the agreement lies. For tenders accepted by General Manager, variations upto 125% of the original agreement value may be accepted by General Manager.

(xii) For tenders accepted by Board Members and Railway Ministers, variations upto 110% of the original agreement value may be accepted by General Manager.

(xiii) The aspect of vitiation of tender with respect to variation in quantities should be checked and avoided. In case of vitiation of the tender (both for increase as well as decrease of value of contract agreement), sanction of the competent authority as per single tender should be obtained.

## **28.0 DISMANTLING OPERATIONS**

**28.1** Dismantling operations are to be carried out at the sole risk and liability of the contractor. The contractor shall take due care to ensure that during dismantling released materials, debris etc. do not fall down and cause any obstructions or damage to adjacent building or injury to the staff or labourers.

Released materials and other debris of dismantling should be removed and stacked at places as directed by the Engineer-in-charge and shall be handed to the SE/Works at his store depot and no extra lead or lift shall be paid on this account.

**28.2** Indemnity by Contractors: The Contractor shall indemnify and save harmless the Railway from and against all actions, suit, proceedings, losses, costs, damages, charges, claims and demands of every nature and description brought or recovered against the Railways by reason of any act or omission of

the Contractor, his agents or employees, in the execution of the works or in his guarding of the same. All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the actual loss or damage sustained, and whether or not any damage shall have been sustained.

**28.3 Commencement of Works:** The Contractor shall commence the works within 15 days after the receipt by him of an order in writing to this effect from the Engineer and shall proceed with the same with due expedition and without delay

## **29.0 EARNEST MONEY DEPOSIT**

**29.1** The tenderer shall be required to deposit earnest money with the tender for the due performance with the stipulation to keep the offer open till such date as specified in the tender, under the conditions of tender. The earnest money shall be as under: Value of the Work Earnest Money Deposit (EMD)

For works estimated to cost up to one crore	2% of the estimated cost of the work
For works estimated to cost more than ₹ 1 crore	Rs. 2 lakhs plus ½% (half percent) of the excess of the estimated cost of work beyond Rs.1 crore subject to a maximum of Rs.1 crore

Note:

- (i) The earnest money shall be rounded to the nearest Rs. 100. This earnest money shall be applicable for all modes of tendering.
- (ii) Any firm recognized by Department of Industrial Policy and Promotion (DIPP) as 'Startups' shall be exempted from payment of earnest money deposit detailed above.

**29.2** It shall be understood that the tender documents have been issued to the tenderer and the tenderer is permitted to tender in consideration of stipulation on his part, that after submitting his tender he will not resile from his offer or modify the terms and conditions thereof in a manner not acceptable to the Engineer. Should the tenderer fail to observe or comply with the said stipulation, the aforesaid amount shall be liable to be forfeited to the Railway.

**29.3** If his tender is accepted this earnest money mentioned in sub clause (a) above will be retained as part security for the due and faithful fulfillment of the contract in terms of Clause 16 of the Standard General Conditions of Contract. The Earnest Money of other Tenderers shall, save as herein before provided, be returned to them, but the Railway shall not be responsible for any loss or depreciation that may happen thereto while in their possession, nor be liable to pay interest thereon.

**29.4** The Earnest Money shall be deposited in cash through e-payment gateway or as mentioned in tender documents.

## **30.0 SECURITY DEPOSIT**

**30.1** The Security Deposit shall be 5% of the contract value. The Bid Security submitted by the Contractor with his tender will be retained/encashed by the Railways as part of security for the due

and faithful fulfillment of the contract by the Contractor. Provided further that, if Contractor submits the Cash or Term Deposit Receipt issued from a Scheduled commercial bank of India or irrevocable Bank Guarantee Bond from a Scheduled commercial bank of India, either towards the Full Security Depositor the Part Security Deposit equal to or more than Bid Security, the Railway shall return the Bid Security, to the Contractor.

Balance of Security Deposit may be deposited by the Contractor in cash or Term Deposit Receipt issued from Scheduled commercial bank of India or irrevocable Bank Guarantee bond issued from Scheduled commercial bank of India, or may be recovered at the rate of 6% of the bill amount till the full Security Deposit is recovered. Provided also that in case of defaulting Contractor, the Railway may retain any amount due for payment to the Contractor on the pending "on account bills" so that the amounts so retained (including amount guaranteed through Performance Guarantee) may not exceed 10% of the total value of the contract.

The Irrevocable Bank Guarantee submitted towards Security deposit shall be initially valid up to the stipulated date of Maintenance period plus 60 days and shall be extended from time to time, depending upon extension of contract granted in terms of Clause 17A and 17B of the Standard General Conditions of Contract.

Note: Security Deposit deposited in cash by the Contractor or recovered from the running bills of a Contractor or submitted by contractor as Term Deposit Receipt(s) can be refunded/returned to the contractor, in lieu of irrevocable Bank Guarantee bond issued from scheduled commercial bank of India, to be submitted by him, for an amount equal to or more than the already available Security Deposit, provided however that, in a contract of value less than Rs. 50 Crore, such refund/ return of the already available Security Deposit is permitted up to two times and in a contract of value equal to or more than Rs. 50 Crore, such refund / return of the already available Security Deposit is permitted up to three times.

**30.2 Refund of Security Deposit:** Security Deposit mentioned in sub clause (1) above shall be returned to the Contractor after the following:

**(a)** Final Payment of the Contract as per clause 51.(1) and

**(b)** Signature of Final Supplementary Agreement or Certification by Engineer that Railway has No Claim on Contractor and

**(c)** Issue of Maintenance Certificate on expiry of the maintenance period as per clause 50.(1).

**30.3 Forfeiture of Security Deposit:** Whenever the contract is rescinded as a whole under clause 62 (1) of GCC, the Security Deposit already with railways under the contract shall be forfeited. However, in case the contract is rescinded in part or parts under clause 62 (1) of GCC, the Security Deposit shall not be forfeited.

**30.4** No interest shall be payable upon the Earnest Money and Security Deposit or amounts payable to the Contractor under the Contract, but Government Securities deposited in terms of Sub-Clause 16.(4)(b) of this clause will be payable with interest accrued thereon.

### **31.0 Performance Guarantee**

The procedure for obtaining Performance Guarantee is outlined below:

**(a)** The successful bidder shall have to submit a Performance Guarantee (PG) within 21 (Twenty one) days from the date of issue of Letter of Acceptance (LOA). Extension of time for submission of PG beyond 21 (Twenty one) days and upto 60 days from the date of issue of LOA may be given by the Authority who is competent to sign the contract agreement. However, a penal interest of 12% per annum shall be charged for the delay beyond 21(Twenty one) days, i.e. from 22nd day after the date of issue of LOA. Further, if the 60th day happens to be a declared holiday in the concerned office of the Railway, submission of PG can be accepted on the next working day. In all other cases, if the Contractor fails to submit the requisite PG even after 60 days from the date of issue of LOA, the contract is liable to be terminated. In case contract is terminated railway shall be entitled to forfeit Earnest Money Deposit and other dues payable against that contract. In case a tenderer has not submitted Earnest Money Deposit on the strength of their registration as a Startup recognized by Department of Industrial Policy and Promotion (DIPP) under Ministry of Commerce and Industry, DIPP shall be informed to this effect. The failed Contractor shall be debarred from participating in re-tender for that work.

**(b)** The successful bidder shall submit the Performance Guarantee (PG) in any of the following forms, amounting to 5% of the contract value:

- (i) A deposit of Cash;
- (ii) Irrevocable Bank Guarantee;
- (iii) Government Securities including State Loan Bonds at 5% below the market value;
- (iv) Deposit Receipts, Pay Orders, Demand Drafts and Guarantee Bonds. These forms of Performance Guarantee could be either of the State Bank of India or of any of the Nationalized Banks;
- (v) Guarantee Bonds executed or Deposits Receipts tendered by all Scheduled Banks;
- (vi) Deposit in the Post Office Saving Bank;
- (vii) Deposit in the National Savings Certificates;
- (viii) Twelve years National Defence Certificates;
- (ix) Ten years Defence Deposits;
- (x) National Defence Bonds and
- (xi) Unit Trust Certificates at 5% below market value or at the face value whichever is less. Also, FDR in favour of FA&CAO (free from any encumbrance) may be accepted.



(c) The Performance Guarantee shall be submitted by the successful bidder after the Letter of Acceptance (LOA) has been issued, but before signing of the contract agreement. This P.G. shall be initially valid upto the stipulated date of completion plus 60 days beyond that. In case, the time for completion of work gets extended, the Contractor shall get the validity of P.G. extended to cover such extended time for completion of work plus 60 days.

(d) The value of PG to be submitted by the Contractor will not change for variation upto 25% (either increase or decrease). In case during the course of execution, value of the contract increases by more than 25% of the original contract value, an additional Performance Guarantee amounting to 5% (five percent) for the excess value over the original contract value shall be deposited by the Contractor. On the other hand, if the value of contract decreases by more than 25% of the original contract value, Performance Guarantee amounting to 5% (five percent) of the decrease in the contract value shall be returned to the Contractor. The PG amount in excess of required PG for decreased contract value, available with Railways, shall be returned to Contractor as per his request duly safeguarding the interest of railways.

(e) The Performance Guarantee (PG) shall be released after physical completion of the work based on 'Completion Certificate' issued by the competent authority stating that the Contractor has completed the work in all respects satisfactorily.

(f) Whenever the contract is rescinded, the Performance Guarantee already submitted for the contract shall be encashed in addition to forfeiture of Security Deposit available with railway.

(g) The Engineer shall not make a claim under the Performance Guarantee except for amounts to which the President of India is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:

(i) Failure by the Contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer may claim the full amount of the Performance Guarantee.

(ii) Failure by the Contractor to pay President of India any amount due, either as agreed by the Contractor or determined under any of the Clauses/Conditions of the Agreement, within 30 days of the service of notice to this effect by Engineer.

(iii) The Contract being determined or rescinded under clause 62 of the GCC.

### **32.0 Price Variation Clause (PVC):**

**32.1 Applicability:** Price Variation Clause (PVC) shall be applicable only in those contracts where tender conditions specifically permits it and irrespective of the contract completion period. Materials supplied free of cost by Railway to the Contractors and any extra item(s) included in subsequent variation falling outside the purview of the Schedule of Items of tender shall fall outside the purview of Price Variation Clause. If, in any case, accepted offer includes some specific payment to be made to consultants or some materials supplied by Railway free or at fixed rate, such payments shall be excluded from the gross value of the work for the purpose of payment/recovery of price variation.

[illegible]

- \* It shall not be considered for any price variation.

The classification mentioned in the table above represents following type of item(s) in the work(s) –

**1 Earthwork in Formation**

- 1A All Item(s) excluding 1B or/and 1C
- 1B Item(s) for supply of Steel
- 1C Item(s) for supply of Cement

**2 Ballast Supply Works**

**3 Tunnelling Works (Without Explosives)**

- 3A All Item(s) excluding 3B or/and 3C or/and 3D or/and 3E
- 3B Item(s) for supply of Steel
- 3C Item(s) for supply of Cement or/and Grout
- 3D Item(s) for Fabrication & Erection of Structures including supply of Steel
- 3E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

**4 Tunnelling Works (With explosives)**

- 4A All Item(s) excluding 4B or/and 4C or/and 4D or/and 4E
- 4B Item(s) for supply of Steel
- 4C Item(s) for supply of Cement or/and Grout
- 4D Item(s) for Fabrication & Erection of Structures including supply of Steel
- 4E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

**5 Building Works**

- 5A All Item(s) excluding 5B or/and 5C or/and 5D or/and 5E
- 5B Item(s) for supply of Steel
- 5C Item(s) for supply of Cement
- 5D Item(s) for Fabrication & Erection of Structures including supply of Steel
- 5E Item(s) for Fabrication & Erection of Structures excluding supply of Steel.

**6 Bridges & Protection work**

- 6A All Item(s) excluding 6B or/and 6C or/and 6D or/and 6E
- 6B Item(s) for supply of Steel
- 6C Item(s) for supply of Cement
- 6D Item(s) for Fabrication, Assembly, Erection & Launching of Girders including supply of Steel
- 6E Item(s) for Fabrication, Assembly, Erection & Launching of Girders excluding supply of Steel

**Permanent Way linking Platform, Passenger Amenities**

- 8A All Item(s) excluding 8B or/and 8C or/and 8D or/and 8E
- 8B Item(s) for supply of Steel item/fittings
- 8C Item(s) for supply of Cement Item

8D Item(s) for Fabrication & Erection of Structures including supply of Steel

8E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

**Any Other Works not covered in Classification 1 to 8**

9A All Item(s) excluding 9B or/and 9C or/and 9D or/and 9E

9B Item(s) for supply of Steel

9C Item(s) for supply of Cement or/and Grout

9D Item(s) for Fabrication & Erection of Structures including supply of Steel

9E Item(s) for Fabrication & Erection of Structures excluding supply of Steel

**32.7 Formulae:** The Amount of variation in prices in various components (labour, material etc.) shall be worked out by the following formulae:

1. 
$$L = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (L_Q - L_B) \times L_C}{L_B \times 100}$$
2. 
$$M = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (M_Q - M_B) \times M_C}{M_B \times 100}$$
3. 
$$F = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (F_Q - F_B) \times F_C}{F_B \times 100}$$
4. 
$$E = \frac{(W) \times (E_Q - E_B) \times E_C}{E_B \times 100}$$
5. 
$$PM = \frac{(W \text{ or } W_{SF} \text{ or } W_F \text{ or } W_{SFL} \text{ or } W_{FL}) \times (PM_Q - PM_B) \times PM_C}{PM_B \times 100}$$
6. 
$$S = \frac{(W \text{ or } W_S \text{ or } W_{SF}) \times (S_Q - S_B) \times S_C}{S_B \times 100}$$
7. 
$$C = \frac{(W \text{ or } W_C) \times (C_Q - C_B) \times C_C}{C_B \times 100}$$

**(II) For Railway Electrification Works**

1. 
$$T = (0.4136 \times (C_Q - C_B) \times 85)$$
2. 
$$R = [0.94 \times (R_T - R_O) / R_O + 0.06 \times (Z_T - Z_O) / Z_O] \times 85$$
3. 
$$N = [(P_T - P_O) / P_O] \times 85$$
4. 
$$I = [(I_T - I_O) / I_O] \times 85$$
5. 
$$G = [(M_Q - M_B) / M_B] \times 85$$
6. 
$$Er = [(L_Q - L_B) / L_B] \times 85$$

L Amount of price variation in Labour

M	Amount of price variation in Materials
F	Amount of price variation in Fuel
E	Amount of price variation in Explosives
PM	Amount of price variation in Plant, Machinery and Spares
S	Amount of price variation in Steel Supply Item
C	Amount of price variation in Cement Supply Item
T	Percentage variation payable on the gross value of bill of Concreting (Bill(s) of Quantities for concrete items)
R	Percentage variation payable on the gross value of bill of Ferrous Items (Bill(s) of Quantities for ferrous items)
N	Percentage variation payable on the gross value of bill of Non-Ferrous Items (Bill(s) of Quantities for non-ferrous items)
I	Percentage variation payable on the gross value of bill of Insulator (Bill(s) of Quantities for Insulator items)
G	Percentage variation payable on the gross value of bill of General Works (Bill(s) of Quantities for General items)
Er	Percentage variation payable on the gross value of erection (Bill(s) of Quantities for Erection Item)
L <sub>C</sub>	% of Labour Component in the item(s)
M <sub>C</sub>	% of Material Component in the item(s)
F <sub>C</sub>	% of Fuel Component in the item(s)
E <sub>C</sub>	% of Explosive Component in the item(s)
PM <sub>C</sub>	% of Plant, Machinery and Spares Component in the item(s)
S <sub>C</sub>	% of Steel Supply item Component in the item(s)
C <sub>C</sub>	% of Cement Supply item Component in the item(s)
W	Gross value of work done by Contractor as per on-account bill(s) excluding the Gross value of work under WS or/and WC or/and WSF or/and WF or/and WSFL or/and WFL and cost of materials supplied by Railway either free or at fixed rate,
W <sub>S</sub>	Gross value of work done by Contractor for item(s) of supply of steel.
W <sub>C</sub>	Gross value of work done by Contractor for item(s) of supply of cement and /or supply of grout material.
W <sub>SF</sub>	Gross value of work done by Contractor for item(s) of Fabrication & Erection of Structures including supply of Steel.
W <sub>F</sub>	Gross value of work done by Contractor for Fabrication & Erection of Structures excluding supply of Steel.
W <sub>SFL</sub>	Gross value of work done by Contractor for item(s) of Fabrication, Assembly, Erection / Launching of Girders including supply of Steel.
W <sub>FL</sub>	Gross value of work done by Contractor for item(s) of Fabrication, Assembly, Erection / Launching of Girders excluding supply of Steel.
L <sub>B</sub>	Consumer Price Index for Industrial Workers - All India : Published in R.B.I. Bulletin for the base period

L <sub>Q</sub>	Consumer Price Index for Industrial Workers - All India : Published in R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration
M <sub>B</sub>	Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the base period
M <sub>Q</sub>	Wholesale Price Index: All commodities – as published in the R.B.I. Bulletin for the average price index of the 3 months of the quarter under consideration
F <sub>B</sub>	The average of official prices of Diesel available on the official website of 'Petroleum Planning and Analysis cell' under Ministry of Petroleum and Natural Gas for Delhi, Kolkata, Mumbai & Chennai, for the base period
F <sub>Q</sub>	The average of official prices of Diesel available on the official website of 'Petroleum Planning and Analysis cell' under Ministry of Petroleum and Natural Gas for Delhi, Kolkata, Mumbai & Chennai, for the 3 months of the quarter under consideration
E <sub>B</sub>	Index number of Monthly Whole Sale Price Index for the category 'Explosive' of g). Manufacture of other chemical products under (J). MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS, published by Office of Economic Adviser, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (DIPP), for the base period.
E <sub>Q</sub>	Index number of Monthly Whole Sale Price Index for the category 'Explosive' of (g). Manufacture of other chemical products under (J). MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS, published by Office of Economic Adviser, Govt. of India, Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (DIPP), for the average price index of 3 months of the quarter under consideration.
PM <sub>B</sub>	Index Number of Wholesale Prices in India by Groups and Sub Groups (Averages) for Manufacture of machinery for mining, quarrying and construction' – published in RBI (Reserve Bank of India) Bulletin, for the base period.
PM <sub>Q</sub>	Index Number of Wholesale Prices in India by Groups and Sub Groups (Averages) for 'Manufacture of machinery for mining, quarrying and construction' – published in RBI (Reserve Bank of India) Bulletin, for the average price index of 3 months of the quarter under consideration.
S <sub>B</sub>	The average rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in Clause 46A.9; for the base period.
S <sub>Q</sub>	The average rate provided by the Joint Plant Committee for the relevant category of steel item as mentioned in Clause 46A.9; for the 3 months of the quarter under consideration.
C <sub>B</sub>	Index No. of Wholesale Price Index of sub-group Cement, Lime & Plaster as published in RBI Bulletin for the base period
C <sub>Q</sub>	No. of Wholesale Price Index of sub-group Cement, Lime & Plaster as published in RBI Bulletin for the average price index of the 3 months of the quarter under consideration
R <sub>T</sub>	IEEMA price index for Steel Blooms (size 150mmx150mm) for the month which is two months prior to date of inspection of material.
R <sub>O</sub>	IEEMA price index for Steel Blooms (size 150mmx150mm) for the month which is one month prior to date of opening of tender

$P_T$	IEEMA price index for Copper wire rods for the month which is two months prior to date of inspection of material.
$P_O$	IEEMA price index for Copper wire bar for the month which is one month prior to date of opening of tender.
$Z_T$	IEEMA price index for Zinc for the month which is two months prior to date of inspection of material
$Z_O$	IEEMA price index for Zinc for the month which is one month prior to date of opening of tender
$I_T$	RBI wholesale price index for the sub-group “Insulators” for the month which is two months prior to date of inspection of material
$I_O$	RBI wholesale price index for the sub-group “Insulators” for the month which is one month prior to date of opening of tender

**32.8.** The demands for escalation of cost shall be allowed on the basis of provisional indices as mentioned above in Clause 46A.7. Any adjustment needed to be done based on the finally published indices shall be made as and when they become available.

**32.9.** Relevant categories of steel for the purpose of operating Price Variation formula as mentioned in this Clause shall be as under:

Sl No.	Classification	Rates to be used for calculating SQ or SB
1	Reinforcement bars and other rounds	Average of per tonne rates of 10mm dia TMT & 25mm dia TMT; confirming IS1786; Fe 500
2	All types and sizes of angles, channels and joists	Average of per tonne rates of ‘Angle 75x75x6mm, Mild Steel Plate 10mm thickness and Channel 150x75mm; confirming IS2062, E250 Gr “A”
3	All types and sizes of plates	Average of per tonne rates of ‘MS Plates 10mm thickness and 25mm thickness; confirming IS2062, E250 Gr “A”
4	Any other section of steel not covered in the above categories	Average of price for the 3 categories covered under SL 1, 2 & 3 in this table.

### **39.10 Price Variation during Extended Period of Contract**

The price adjustment as worked out above, i.e. either increase or decrease shall be applicable upto the stipulated date of completion of work including the extended period of completion where such extension has been granted under Clause 17-A of the Standard General Conditions of Contract. However, where extension of time has been granted due to Contractor’s failure under Clause 17-B of the Standard General Conditions of Contract, price adjustment shall be done as follows:

a. In case the indices increase above the indices applicable to the last month of original completion period or the extended period under Clause 17-A, the price adjustment for the period of extension granted under Clause 17-B shall be limited to the amount payable as per the Indices applicable to the last month of the original completion period or the extended period under Clause 17-A of the Standard General Conditions of Contract; as the case may be.

b. In case the indices fall below the indices applicable to the last month of original/ extended period of completion under Clause 17-A, as the case may be; then the lower indices shall be adopted for the price adjustment for the period of extension under Clause 17-B of the Standard General Conditions of Contract.

**40.0 Maintenance of Works:** The Contractor shall at all times during the progress and continuance of the works and also for the period of maintenance specified in the Tender form after the date of issue of the certificate of completion by the Engineer or any other earlier date subsequent to the completion of the works that may be fixed by the Engineer, be responsible for and effectively maintain and uphold in good substantial, sound and perfect condition all and every part of the works and shall make good from time to time and at all times as often as the Engineer shall require, any damage or defect that may during the above period arise in or be discovered or be in any way connected with the works, provided that such damage or defect is not directly caused by errors in the contract documents, act of providence or insurrection or civil riot, and the Contractor shall be liable for and shall pay and make good to the Railway or other persons legally entitled thereto whenever required by the Engineer so to do, all losses, damages, costs and expenses they or any of them may incur or be put or be liable to by reasons or in consequence of the operations of the Contractor or of his failure in any respect.

**41.0 Certificate of Completion of Works:** As soon as in the opinion of the Engineer, the work has been completed and has satisfactorily passed any final test or tests that maybe prescribed, the Engineer shall issue a certificate of completion duly indicating the date of completion in respect of the work and the period of maintenance of the work shall commence from the date of completion mentioned in such certificate. The certificate, inter alia, should mention that the work has been completed in all respects and that all the contractual obligations have been fulfilled by the Contractor and that there is no due from the Contractor to Railways against the contract concerned.

The Engineer may also issue such a certificate indicating date of completion with respect to any part of the work (before the completion of the whole of work), which has been both completed to the satisfaction of the Engineer and occupied or used by the Railway. When any such certificate is given in respect of part of a work, such part shall be considered as completed and the period of maintenance of such part shall commence from the date of completion mentioned in the completion certificate issued for that part of the work.

**42.0. Maintenance period:** The maintenance period shall vary depending upon the nature of work of the concerned tender

**42.1** On the completion of work to the satisfaction of the Engineer it will be taken over from the contractor. From the date of taking over the contractor shall be responsible for the maintenance of all



works for further period of 6 (Six) months but it must cover the subsequent period of one monsoon from 01st June to 30th November.

**42.2** To cover up monsoon period, the maintenance period will be extended in cases when required and contractor shall remain responsible for maintenance for this extended period also. The contractor shall make good and remedy at his own expense within such period as may be stipulated by the Engineer, any defect which may develop or may be before the expiry of this period of twelve months and intimation of which has been sent to contractor within seven days of the expiry of the said period by a letter, sent by hand delivery or by registered post. In case the contractor fails to make adequate arrangements to rectify the defects within seven days of the receipt of such notices, the Engineer without further notice may make his own arrangement to rectify the defects and the cost of such rectification shall be recovered from the Security Deposit of the contractor or from any other money due to the contractor under this or may other contract.

#### **43.1. COMPLETION PERIOD:**

The period of completion of the contract is calculated from the date of issue of LOA

#### **43.2 Mobilization advance and tools & plants advance:**

The tenderer should note that Mobilization advance and Tools and plants advance will not be admissible for this work.

**44.0** Tenderer(s)/Contractors(s) engaging private persons as labourers /supervisors and others in works contracts should get the antecedents of all such persons verified properly and should ensure that only such persons, who do not have any criminal records and /or not involved with anti-social elements and who are appropriate for carrying out works in the Railway premises or works involving safety of passenger and goods trains, are engaged by him/them. The Tenderer(s) / Contractors(s) should issue to all such private persons clear photo identity cards under their authority. A list of names of such persons working in the area should be furnished to the Railway ( the agreement executing authority ). The Tenderer(s)/Contractors(s) are responsible for all the commissions and omissions of all such persons engaged by them.

**45.0** In case of accidents/natural calamities involving human lives, vehicles and equipment of the contractors will be drafted to accident for the work(s) carried out by him at the accident site as a non schedule item(s) for which rates have to be fixed by mutual consultation i.e., between the contractor and the Railway Administration.

#### **46.0 Guarantee/Warranty:**

“The Contractor should guarantee that the said goods/stores/articles would continue to conform to the description and quality as aforesaid, for a period of 30 months after their delivery or 24 months from the date of placement in service which ever shall be sooner, and this warranty shall survive notwithstanding the fact that the goods/stores/articles may have been inspected, accepted and payment therefore made by the purchaser”.

**47.0** All documents to support fulfilment of eligibility criteria should be furnished along with tender and should be available at the time of tender opening. The tenderer shall upload scanned copies of required documents. Tenders not accompanied by documentary evidence in support of eligibility criteria will be rejected. No post tender communication in any form will be made or entertain after opening of this tender in this regard.

**48.0** The tenderers, for carrying out any construction work, shall get themselves registered with the Registering Officer under Section-7 of the Building and Other Construction Workers Act, 1996 and Rules made thereto by the concerned State Govt., and submit Certificate of Registration issued by Registering Officer of the concerned State Govt. (Labour Dept.). The Cess shall be deducted from contractor's bills as per provisions of the Act.

**49.0 Conservancy Cess Charges:**

In terms of Railway Board Letter no. F(X)I/95/I/1 dated 31.05.2006, the Conservancy Cess Charges are recoverable from the Contractor's Bills based on the number of labourers employed per day by the Contractor and the modified rates of recovery of conservancy cess charges shall be applicable.

**1.** Railways should ensure that necessary sanitary facilities are provided by the Contractors for their labour in terms of clause 59 (4) of the General Conditions of Contract and where they fail to do so, notice should be given to the Contractors that the same will be provided by the Railway at their cost and recovery should be made from the bills in the following manner.

a) If the Contractors labour are employed at station and colonies where Railway sanitary facilities do exist recoveries should be made at the Rates stipulated by the Railway Board.

b) In respect of Contractors labour working between stations are at isolated places, where Railway sanitary facilities do not exist, recovery should not be made at the fixed rates stipulated by the Railway Board, but the Railway may provide these facilities at the cost of the Contractor, after giving him due notice as stated above.

c) CMS/MSs/DMOs should inspect such sanitary arrangements of Contractors independently and if not satisfactory, report officially in writing to the DEN and DRM concerned.

d) Supply contractors may be exempted from the purview of recovery of cess charges, since, their labours enter in the Railway premises only to load or unload the materials.

e) No Cess Charges are recoverable from contractors engaged in construction work on new lines, away from open line. This will apply only until the line is opened for traffic partially or wholly. However, if safaiwalies are engaged by Railways on construction work on new lines, necessary recoveries will have to be made from contractors.

f) No Conservancy Cess Charges need be recovered from the Contractors who are engaged for removal of night soil and rubbish from railway colonies.

2. Where only “indirect Sanitary services are rendered, the Conservancy Cess Charges should only be 20 % of the above charges. The principle of recovery of Cess Charges on the basis of Direct/Indirect services will be applicable to categories no. III, IV, VI, VII, IX to XVI and XIX and in all other categories ie., I, II, V & VII, XVII & XVIII the cess charges will be recoverable at the rate of direct services only.

**Direct Services:** are those where the Conservancy stall undertake to clean regularly the inside of the premises rented/licensed to the above mentioned parties.

**Indirect Services:** Will be those where no such direct services are provided Levy service charges are only when services direct or indirect.

No charges are recoverable wherever no services are provided. However, facts of such services rendered should be certified by the Chief Medical Superintendent, Medical Superintendent/ Divisional Medical Officer, concerned.

**50.0. Vitiating Clause:** ( Ref; PCE/MAS No.W.496/P/Tender Documents dt. 19.08.08).

In the event of Vitiating occurring due to increase or decrease In quantities among the first ,second and third lowest valid tenderers, the vitiating shall be to the contractor’s account. The total value of the work shall be calculated at the rate offered by those tenderers and the amount payable shall be limited to the lowest aggregate value as worked out.

Vitiating as above shall be worked out as a whole for Agreement including all variations in quantities.

#### **51.0. SAFETY AT WORK SITES:**

**51.1** The contractor shall not start any work without the presence of railway supervisor at site. Wherever the road vehicles and/or machinery are required to work in the close vicinity of railway line, the work shall be so carried out that there is no infringement to the railway’s schedule of dimensions. For this purpose the area where road vehicles and/or machinery are required to ply, shall be demarcated and acknowledged by the contractor. Special care shall be taken for turning/reversal of road vehicles/machinery without infringing the running track. Barricading shall be provided wherever justified and feasible as per the site conditions.

**51.2** The contractor shall entirely be responsible for ensuring safety of his labour, vehicles, construction plants and equipment while working. No extra payment shall be allowed to the contractor for any safety precautions to be observed during the execution of the work. The cost of such precautions shall be deemed to have been included in the rates for all the items of the schedule.

#### **52.0 Clause 55-B to GCC: Provisions of Employees Provident Fund and Miscellaneous Provisions Act, 1952:**

The Contractor shall comply with the provisions of Para 30 and 36-B of the Employees Provident Fund Scheme, 1952; Para 3 and 4 of Employee’s Pension Scheme, 1995; and Para 7 and 8 of Employees

Deposit Linked Insurance Scheme, 1976; as modified from time to time, wherever applicable and shall also indemnify the Railway from and against any claims under the aforesaid Act and the Rules’.

### **SPECIAL CONDITIONS OF CONTRACT FOR MOVEMENT OF VEHICLES NEAR RAILWAY TRACK:**

#### **Safety precautions**

- 1.** No lorry or road vehicles shall be operated so as to affect the safety of trains. They should be allowed to work well outside the moving dimensions. At each of the locations where road vehicle machinery are working, an authorized responsible railway official should be posted as incharge to ensure that the road vehicle machinery do not infringe the schedules, moving dip engines any time and protect the track in case of emergency. To facilitate the driver to whistle, a whistle board will have to be provided at the appropriate place.
- 2.** At vulnerable locations where construction activity is in progress adjacent to existing railway lines should be cordoned off with proper barricades. The most vulnerable locations shall be barricaded with rail barricades projecting at least in above the ground. At all other locations barricades of not less than 1.5 m height consisting of bamboo, casuarinas poles and supported horizontally with similar bamboo, casuarinas poles should be provided.
- 3.** All the barricades are to be painted or stuck on with road illuminous paint strip at suitable intervals.
- 4.** The entry to new banks which run alongside the existing track should be protected by barriers which can be closed and opened when necessary.
- 5.** At locations which are not vulnerable provision of barricade can be with (i) 6.6 m wide and 0.3 m deep trenches or (ii) stones of minimum size 30 cm x 15 cm at 1 m intervals and projecting 0.3 m above ground level and painted white. Trenches should be allowed only in those locations where they do not lead to subsidence to railway track as may be assessed by the SE/Pway.
- 6.** Barriers shall also be provided in the case of doublings, particularly at the existing formation. These barriers are to be opened only for the movement of railway contractors authorized vehicle or other railway vehicles.
- 7.** Railway vehicles employed by the contractor should have the certificate for its road worthiness and each vehicle numbered and the license particulars maintained. Contractor should ensure that the drivers permitted by them to work on such road vehicles have photo identity cards.
- 8.** Wherever the work requires the movement of road vehicles within a distance of 3.5 to 6 m from the center line of the nearest track, such work shall be done only in the presence of railway employees authorized by the Engineer in charge. No part of the road vehicles will be allowed at less than 3.5 m from track center. Cost of such railway employees shall be borne by the Railway.

**9.** No movement of road vehicles within 6 m of railway track shall be permitted unless the driver of the vehicles is assisted by a helper with a whistle who shall guide him and ensure safety.

**10.** The driver of the vehicles shall always face the track. When reversing the vehicles and whenever he cannot face the track for whatever reason, he shall invariably be assisted by the helper with a whistle who should guide him and ensure safety.

**11.** All work sites shall be supervised by the contractor representative as also a representative of the Railway organization. The contractor's representative shall be issued with a certificate by XEN/ADEN to the effect that they have acquired sufficient knowledge about the safety precautions that are needed to be followed while working near the track. Whenever work of plying of road vehicles within 6 m zone is actually in progress, look out men should invariably be available. Look out men will have to be provided by the contractor from out of the list of persons who are authorized to carry out these duties.

**12.** Authorization will be issued to the individuals by the Engineer In charge. One supervisor who shall be permanent staff (Trackman) loaned to JE/W/CN from the respective gangs and in whose beat the work is in progress (to be spared by the respective SE/P.way) will monitor the availability and alertness of the lookout men. In case of non availability of look out men, the Railway supervisor shall stop further activities of plying of road vehicles. Even if no work is executed in the night, look out men shall patrol the beat as identified by the representative of the CN Organization to ensure the safety of the running trains especially from infringements.

**13.** Working alongside the track during night hours is normally prohibited. Such work can be done in the night only with the written permission of the Engineer of the construction activity. Where night work is permitted, lighting of the work site as required should be done.

**14.** The contractor shall be fully responsible against loss or damage arising from working of lorries and other machinery adjacent to the running track and making the contractor safety responsible for any loss or damage which the Railway or the Contractor or any 3rd party may suffer.

**15.** The contractor shall be fully responsible for ensuring safety at all times and shall bear the cost of all damages in cases of accidents/unusual occurrences resulting in damage to railway property and passengers.

**16.** Supervisors and operators of the work executive agencies working at or near Railway track should undergo specified training on matters to safe working along and on the track salient features of observing moving dimensions and clearances which may be imparted to such supervisors at Zonal/Divisional Training Schools and the cost of such training shall be borne by the contractor, which will be Rs. 93/- per trainee per day for the year 2000 with a 10% escalation p.a. with an expected duration of the course of about 3 days so as to ensure that they get acquainted with safety precautions that are required to be taken while executing works which have bearing on the safety of the running trains.

**17.** The supervisors mentioned in Para 9 above should be trained in protection rules and supplied with minimum equipment required for protecting the track. Such staff should also be provided with basic communication facility (a walkie talkie with communication facility to the nearest Station Master or adjacent site) so as to communicate with the nearest station in case of emergencies/unusual occurrences. Till it is made available, the supervisor shall use the nearest LC gate telephone or other means of communications to relate the incident most speedily.

#### **UNDERTAKINGS BY THE TENDERER**

**1.** Until a formal agreement is prepared and executed, acceptance of this tender shall constitute a binding contract between us subject to modifications, as may be mutually agreed to between us and indicated in the letter of acceptance of my/our offer for this work.

**2.** I/We also hereby agree to abide by the Indian Railways Standard General Conditions Of Contract, with all correction slips up-to-date and to carry out the work according to the Special Conditions of Contract and Specifications of materials and works as laid down by Railway in the annexed Special Conditions/Specifications, Schedule of Rates with all correction slips up to date for the present contract.

**3.** I/We have read the various conditions to tender attached hereto and agree to abide by the said conditions.

**4.** I/We also agree to keep this tender open for acceptance for a period of 60 days from the date fixed for opening the same.

**5.** I/We offer to do the work for Dy.CE/Workshops/PER, at the rates quoted in the attached schedule and hereby bind myself/ourselves to complete the work in all respects within the period of completion stipulated in the tender document, from the date of issue of letter of acceptance of the tender. The amount as stipulated in the tender document is herewith forwarded as Earnest Money. Full value of the earnest Money shall stand forfeited without prejudice to any other right or remedies in case my/our Tender is accepted and if :

(a) I/We do not execute the contract documents as stipulated in performance guarantee clause of GCC as detailed in general instructions.

(b) I/We do not commence the work within seven days after receipt of orders to that effect.

**6.** I/We hereby Confirm that the rates, rebates and/or other financial terms, if any, quoted by us in the relevant fields of the Financial Bid page will only be the ruling terms for deciding the inter-se ranking, and any such condition having financial repercussions, if quoted by us anywhere else including attached documents shall not be considered for deciding inter-se ranking.

**7.** However, Railways shall have the right to incorporate any such condition quoted by us, in the contract, at their discretion, if contract is placed on us.

8. I/We have read the various conditions attached/ referred to in this tender document, and agree to abide by the said conditions.

**SPECIAL CONDITIONS OF CONTRACT (GENERAL):**

**1.0.Handing Vitiating during Variation in Contract Quantities:**

In partial modification of existing instructions, it has been decided that as a result of variations, a contract value between tenderers are noticed to have been exceeded.

SL No	Value of contract	Percentage difference between present Contractor and new L-1 as a result of variation ( percentage shall be calculated with base as the revised contract quantities multiplied by the rates of the present contractor)
	Small value contracts ( Tender Value less than Rs 50 lakhs)	10
	Other than small value contracts ( Tender value equal to or more than equal to or more than Rs 50 lakhs )	5

**1.1:** When the percentage difference between present Contractor and new L-1 is noticed as becoming beyond the values specified above, the following action shall be taken. The Railway administration should immediately examine whether it is practicable to bring in a new agency to carry out the extra quantity of the work keeping in view the progress of the work in accordance with the original contract and the nature and lay-out of the work. If it is found that there will be no serious practical difficulty in meeting the additional quantity of work done by another agency, then fresh tenders for the extra quantity may be invited otherwise negotiating the rate with the existing contractor for arriving at a reasonable rate for the additional quantities of work, may be adopted.

**1.2.** The above shall be regulated as under:

**a).** The case shall be decided by the tender accepting authority ( competent for the revised quantity) and shall not be treated as a case of single tender. The provisions of railway Board letter no.2007/CE.I/CT/18/Pt.XII dated 31.12.2010 here by gets superseded.

**b).** These instructions will be similarly applicable to earning contracts with H-1, H-2 substituted for L-1, L-2 and so on.

**c).** Executives while executing the work shall make all efforts to ensure that no vitiating takes place in normal circumstances. Vitiations should be an exception rather than routine affairs. Efforts should be made to invite bids to on the basis of percentage above / below/ at par.

**d).** Vitiating should always be computed with respect to the items , rate , quantities, and conditions as available at the time of tender opening and subsequent changes/additions by way of new items will not be counted for computing Vitiating.

## **2.0.** Dispense with Vetting of Brief Notes & size of TC Recommendation

**2.1:** It has been decided that all system generated statements from IREPS web sites, post tender-opening are directly seen by the Tender Committee and Vetting of the comparative statement and vetting of briefing note requires for Tender Committee proceedings.

**2.2** The tender committee proceedings are made brief and crisp.

## **3.0.** : System verification of tenderers credentials:

**3.1.:** For the works tenders, it has been decided to adopt the affidavit-based system of credential verification. The tenderer shall submit along with the tender document, documents in support of his/their claim to fulfill the eligibility criteria as mentioned in the tender document. Each page of the copy of documents/certificates in support of credentials, submitted by the tenderer, shall be self-attested/digitally signed by the tenderer or authorized representative of the tendering firm. Self – attestation shall include signature , stamp and date ( on Each page). Only those documents which are declared explicitly by the tenderer as “documents supporting the claim of qualifying the laid down eligibility criteria”, will be considered for evaluating his/their tender. The system shall be applicable once it is made operational in IREPS. This system is already being followed by some of Railway PSUs.

**3.2 :** in all works tender documents, following para may be added in the section describing the qualification and eligibility criteria.

“The tenderers shall submit a notarized affidavit on a non-judicial stamp paper stating that they are not liable to be disqualified and all their statements / documents submitted along with bid are true and factual. Standard format of the affidavit to be submitted by the bidder is enclosed **as annexure-A** . “Non submission of affidavit by the bidder shall result in summary rejection of his/their bid. And it shall be mandatorily incumbent upon the tenderer to identify, state and submit the supporting documents duly self attested by which they/he is qualifying the Qualifying Criteria mentioned in the Tender Document. It will not be obligatory on the part Tender Committee to scrutinize beyond the submitted document of tenderer as far as his qualification for the tender is concerned”.

With the submission of the affidavit as mentioned above, the practice of verification of tenderer’s documents by the Railways may be dispensed with. Following clause also be added to the Instructions to Bidders.

**a).** The railway reserves the right to verify all statements , information and documents submitted by the bidder in his tender offer, and the bidder shall, when so required by the Railway, make available all such information, evidence and documents as may be necessary for such verification . Any such verification or lack of verification, by the railway shall not relieve the bidder of its obligations or liabilities here under nor will it affect any rights of the railway there under.



**b).** In case of any wrong information submitted by tenderer, the work shall be terminated, Earnest Money Deposit (EMD), Performance Guarantee (PG) and security Deposit (SD) of Contract forfeited and agency barred for doing business on entire Indian railways for 5 ( Five) Years.

**c).** With such a system of self-certification of credentials, tender finalization should also be speeded up. It has accordingly been decided that the tender validity period should be reduced to 45 days for single packets and 60 days for two packet system of tendering (in place of the present limits of 90 days and 120 days) for tenders having affidavit based system of credential verification.

#### **4.0.0. Tender Invitation at short notice period:**

In continuation of existing instructions, for tenders called with short notice period of 21 days, tender validity period would be 30 days and for tenders called with 14 days notice period, the tender validity would be 20 days only. This would in fact justify the urgency of work.

**4.0.1.** Steel shall be procured from the main producer such as SAIL/TISCO/JSW/RINLVSP or authorized stock yards and has to be confirmed to IS 1786-1985. Rerolled steel will not be accepted

#### **5.0.0. Calling tenders pending sanction of estimates:**

In case of urgency, open tenders may be called before sanction of detailed estimates, with the approval CWM/WS/PERs. However, the order of acceptance shall be issued only after the sanction of detailed estimate.

#### **6.0: Multiple L-1**

In case of more than one L-1 bidder, tender may be awarded to tender having higher Bid Capacity. In case Bid Capacity is also the same, Tender having done more value of similar work in the last three financial years and the current financial year upto the date of opening of the tender, may be selected for the award. Instructions with respect to Bid Capacity will follow.

#### **7.0. Discharge of tenders:**

Before discharging a tender due to higher rates etc., the TC and TAA may examine the possibility of a cartel formation, getting lower rates as a result of retendering loss of transparency in re-invited tender, the opportunity cost for delay in the execution of the work and the cost of retendering. Each zonal Railway may work out a model cost estimate for the process of tendering which may be kept in view by the TC and TAA while examining the tender.

##### **a. Price variation Clause (PVC).**

Price variation Clause (PVC) in works Contract is dealt with in accordance with provisions of item 46A of GCC – July 2014. In order to simplify and enhance the pace of the works, it has been decided to remove the PVC clause in all works contract tenders having value less than Rs.5 Crore.

#### **9.0. Project Management Consultancy (PMC):**

In partial modification to railway Board's letter no 2007/CE.I/CT/18 dated 05.07.2010, and 14.09.2017, it has been decided to extend the scope of PMC services for all works contracts costing more than Rs.10 Crore in open line, Construction and RE organization while ensuring the following:

- a). Personal approval of DRM/PHOD/CHOD would be required on cases basis.
- b). The proposal to engage PMC services for any project/contract shall be governed as per instruction contained in Railway Boards letter mentioned above (and amended from time to time ). These instructions will also be applicable for all the works approved for PMC by DRM/PHOD/CHOD.
- c).The word Deputy CE or its equivalent mentioned in the instructions above shall mean Equivalent Branch Officer of the Division/Railway Electrification (RE)/Workshops.
- d). The expenditure incurred on PMCs should be within the D&G charges as per extant instructions.

#### **10.0. Contractor's measurements:**

In partial modification to Railway Boards letter no.2016/CE-I/CT/14 Measurement /1 dated 21.09.2017 and 2016/CE-I/CT/14 Measurement /3 dated: 21.09.2017, it has now been decided to extend the scope of contractors Measurement for all works costing more than Rs.5 Crore in Division, Construction and RE organization, subject to following condition.

- a).approval of DRM/PHOD/CHOD without finance concurrence,
- b). The proposal to have works measurement by Contractors for any project/Contract shall be governed in accordance with the instructions contained in Railway Boards letters mentioned above (Amended from time to time). Such instructions are applicable for all the works approved for Contractors Measurement by DRM/PHOD/CHOD.
- c). The word Deputy CE or its equivalent mentioned in the instructions above shall mean equivalent Branch Officer of the Division / RE organization. XEN/AXEN shall mean their equivalent counterparts in division/RE organization.

#### **11.0. Deposit works:**

These works are defined in accordance with para 1843 of IR Code of Engineering Department. The method of execution is also defined therein. The limit of variation by 20% due to reasons other than escalation etc., may not be applicable for Deposit Works. Sanction, Execution and Variations in these works shall be made by the Railways administration in consultation with the sponsoring authority bearing the cost of the deposit works, within the board guidelines provided in IR Code of Engineering Department and Model SOP-October 2017. Revised delayed estimate should how ever be within the power of the sanctioning authority.

**12.0.** This issues with the concurrence of Associate Finance of Transformation Cell Railway Board.

**13. Deployment of Site Engineers at Work site: Ref: W416/1/17-18/Sys.Imprn. dt21/03/2019**

In terms of provisions of new clause 26.A to the General conditions of contract (GCC), the contractor shall also employ the following qualified Engineers during execution of the allotted work.

(a) One qualified Graduate Engineer when cost of the work to be executed is Rs. 200 Lakhs and the above, and

(b) One qualified Diploma Holder when cost of the work to be executed is Rs. 25 Lakhs but less than Rs. 200 Lakhs.

In case the contractor fails to employ the qualified Engineer, as aforesaid in para 13 above, he in terms of provisions of clause 26A-2 to the GCC shall be liable to pay an amount of Rs. 40,000/- in case of qualified Graduate Engineer and Rs. 25,000/- for qualified Diploma Holder Engineer for each month or part thereof for the default period for the period for the provisions, as contained in para 13 (a) & (b) above respectively.

Provisions for deployment of qualified Engineers (Graduate Engineer or Diploma Holder) shall be for the values as prescribed above. However, for the works contract tenders, if it is considered appropriate by the tender inviting authority, not to have the services of qualified engineer, the same shall be so mentioned in the tender documents by the concerned executive with the approval of officer not below the level of SAG officer, for the reasons to be recorded in writing.

**14.** The contractor shall keep ready arrangements to photograph and/or video graph any activity related to the execution of the work as per the discretion of Railways. This facility should include time stamping and GeoTagging the location with latitude and longitude coordinates. He should use this as per the discretion and instructions of Railways. All such records generated should be handed over to Railways before the issue of Completion certificate.

## **CODES & REFERENCES**

**1.1** The works of this contract shall be executed as per specification contained in following codes subject to stipulations contained in special conditions of contract.

<b>Category</b>	<b>Code</b>	<b>Description</b>
<b>CEMENT</b>		
	IS 269	Spec. For 33 Grade Ordinary Portland Cement (4 <sup>th</sup> Rev.)
	IS 455	Spec. For Portland Slag Cement (4 <sup>th</sup> Revision)
	IS 1489	Spec. For Portland Pozzolana Cement (3 <sup>rd</sup> Rev.)
	IS 4031	Methods Of Physical Tests For Hydraulic Cement (1 <sup>st</sup> Rev.)
	IS 4032	Methods Of Chemical Tests For Cements.

	IS 4845	Definition And Terminology Relating To Hydraulic Cement.
	IS 6452	Spec For High Alumina Cement For Structural Use.
	IS 6909	Spec For Supersulphated Cement.
	IS 8041	Spec. For Rapid Hardening Portland Cement (2 <sup>nd</sup> Rev.)
	IS 8043	Spec For Hydrophobic Portland Cement (2 <sup>nd</sup> Rev.)
	IS 8112	Spec. For High Strength Ordinary Portland Cement (1 <sup>st</sup> Rev.)
	IS 12269	53 Grade Ordinary Portland Cement.
		Concrete Bridge Code
<b>CONCRETE</b>		
	IS 383	Spec. For Coarse And Fine Aggregates From Natural Sources For Concrete (2 <sup>nd</sup> Rev.)
	IS 456	Code Of Practice For Plain And Reinforced Concrete (3 <sup>rd</sup> Rev.)
	IS 516	Methods Of Tests For Strength Of Concrete
	IS 1199	Methods Of Sampling And Analysis Of Concrete
	IS 1791	Spec. For Batch Type Concrete Mixers (2 <sup>nd</sup> Rev.)
	IS 2386 Pt.I to VIII	Methods Of Test For Aggregates For Specific Gravity Density, Voids, Absorption And Bulking.
	IS 2502	Code Of Practice For Bending And Fixing Of Bars For Concrete-Reinforcement.
	IS 2505	Spec. For Concrete Vibrators, Immersion Type (2 <sup>nd</sup> Revision).
	IS 2506	Spec. For Screen Board Concrete Vibrators (1 <sup>st</sup> Rev.)
	IS 2514	Spec. For Concrete Vibrating Tables.
	IS 2514 Pt. i	Spec. For Flyash For Use As Admixture For Concrete
	IS 2514 Pt.iii	For Use As Fine Aggregate For Mortar And Concrete
	IS 4656	Spec. For Form Vibrators For Concrete.
	IS 4925	Spec. For Concrete Batching And Mixing Plant.
	IS 5816	Method Of Test For Splitting Tensile Strength Of Concrete Cylinders.
	IS 6461	Glossary Of Terms Relating To Cement Concrete.
	IS 6461 Pt. I	Concrete Aggregates
	IS 6461 Pt. iv	Types Of Concrete
	IS 6461 Pt.v	Formwork For Concrete
	IS 6461 Pt. vii	Mixing, Laying, Compaction, Curing & Other Construction Aspects.
	IS 6461 Pt.viii	Properties Of Concrete
	IS 6461 Pt.ix	Structural Aspects
	IS 6461 Pt.x	Tests And Testing Apparatus
	IS 7861 Pt.i	Spec. For Extreme Weather Concreting. Recommended Practice For Hot Weather Concrete.
	IS 7861 Pt.ii	Spec. For Recommended Practice For Cold Weather Concreting. (Under Preparation)
	IS 9013	Method Of Making Curing And Determining Compressive Strength Of

		Accelerated Cured Concrete Test Specimens.
	IS 10262	Recommendations Guidelines For Concrete Mix Design.
<b>GENERAL</b>		
		Rules for Rounding Off Numerical Values (Revised 1984)
	IS 1893	Criteria For Earthquake Resistant Design Of Structure (4th Rev.)
	IS 1904	Code of Practice for Structural Safety of Buildings Shallow Foundations (3 <sup>rd</sup> Rev.)
	IS 1905	Code Of Practice For Structural Safety Of Building Masonry Walls (3 <sup>rd</sup> Rev.)
	IS 1911	Schedule Of Unit Weights Of Building Materials (1 <sup>st</sup> Rev.)
	IS 2751	Code Of Practice For Welding Of Mil Steel Bars Used For Reinforced Concrete Construction (1 <sup>st</sup> Rev.)
	IS 3025 Pt.iv	Methods Of Samling And Test (Physical And Chemical) For Water Used In Industry colour (1 <sup>st</sup> Rev.)
	IS 3025 Pt.vi	Odour threshold
	IS 3025 Pt.vii	Taste threshold
	IS 3025 Pt.viii	Taste rating
	IS 3025 Pt.ix	Temperature
	IS 3025 Pt.x	Turbidity
	IS 3025 Pt.xi	Ph Value
	IS 3025 Pt.xii	Density
	IS 3025 Pt.xiii	Saturation index (With. Respect To Calcium Carbonate)
	IS 3025 Pt.xiv	Specific Conductance (Wheatstone Bridge Conductance Cell)
	IS 3025 Pt.xv	Total Reside
	IS 3025 Pt.xvi	Filterable Residue (Total Dissolved Solids)
	IS 3025 Pt.xvii	Non Filterable Residue (Total Suspended Solids)
	IS 3025 Pt.xviii	Volatile And Fixed Residue (Total Filterable & Non filterable)
	IS 3025 Pt.xix	Settleable Matter
	IS 3025 Pt.xx	Dispersion Character(Flow Patterns)
	IS 3025 Pt.xxi	Total Hardness
	IS 3812 Pt.i	Spec. For Flyash For Use As Pozzolana
	IS 3951 Pt.i	Spec. for Structural Hollow Clay Tiles for Floors and Roofs-Filler-Type(1 <sup>st</sup> Rev.)
		Schedule of Dimensions of Railways
	IS 3951 Pt.ii	Spec. For Structural Type (1st Rev.)
	IS 4082	Recommendations On Stacking And Storage Of Construction Materials At

		Site (1st Rev. Construction Of Buildings. (1st Rev.)
	IS 6061 Pt.i	Code Of Practice For Construction Of Floors And Roofs With Joints And Hollow Filler Blocks: With Hollow Concrete Filler Blocks.
	IS 6061 Pt.ii	Spec. For Construction Of Floors And Roofs With Joints And Hollow Filler Blocks With Hollow Clay Filler Blocks. (1st Rev.)
	IS 6061 Pt.ii	Materials (Other Than Cement And Aggregate)
	IS 6061 Pt.vi	Equipment, Tools And Plant
	IS 9103	For Admixtures For Concrete.
	SP 16	Design Aids For Reinforced Concrete Structure.
<b>PSC</b>		
	IS 1343	Code Of Practice For Prestressed Concrete. (1 Rev.)
	IS 6003	Spec. For Indented Wire For Prestressed Concrete.
	IS 6006	Spec. for Uncoated Stress Relieved Strand For Prestressed Concrete (1 <sup>st</sup> Rev.)
	IS 6006 Pt.xi	Prestressed Concrete.
	IS 6006 Pt.xii	Miscellaneous
<b>STEEL</b>		
	IS 226	Spec. For Structural Steel Std. Quality (5th Rev.)
	IS 280	Mild Steel Wire For General Engineering Purpose
	IS 432 Pt 1	Spec. For Mild Steel & Medium Tensile Steel Bars And Hard Drawn Steel Wire For Concrete Reinforcement Mild Steel & Medium Tensile Steel Bars(3rd Rev.)
	IS 432 Pt II	Spec. For Mild Steel & Hard Drawn Steel Wire
	IS 1566	Spec. For Hard Drawn Steel Wire Fabric For Concrete Reinforcement (2 <sup>nd</sup> Rev).
	IS 1785 Pt 1	Spec. For Plain Hard-Drawn Steel Wire For Prestressed Concrete: Cold-Drawn Stress relieved Wire. (2nd Revision)
	IS 1785 Pt.II	Spec For Plain Hard-Drawn Steel Wire For Prestressed Concrete: As Drawn Wire (1 <sup>st</sup> Revision)
	IS 1786	Spec. For Cold Worked steel High Strength Deformed Bars For Concrete Reinforcement (3rd Revision)
	IS 2060	Weldable Structural Steel (3rd Revision)
	IS 2090	Spec. For High Tensile Steel Bars Used In Prestressed Concrete. (1st Rev.)
	IS 9417	Recommendations For Welding Coldworked Steel Bars For Reinforced Concrete Construction (1st Rev.)
	IS 1344	Spec. For Calcined Clay Pozzolana (2nd Revision)

**1.2** The above is a sample and by no means exhaustive. It is only for general guidance and any Indian Railway Standard Code relevant to the subject shall be referred and followed.