



Letter No. RSCL/ 1388 /2020

Date: 10 /08/2020

Addendum -1

With reference to Detailed Tender Call Notice (DTCN) for the Project “Development of Vending Zone near Raghunath Pali Post Office and at Jail Road In Rourkela on Percentage Rate Basis” having Bid Id. No RSCL/ 1252 (vi) /2020 /Dated 23/07/2020 invited by Chief Executive Officer, Rourkela Smart City Limited are hereby modified as follows:

S.No	Reference	In addition of uploaded document
1	Scope of Work Technical Specifications, Supply & Maintenance Obligation	Please refer Attachment -A

Sd/-

Chief Executive Officer, RSCL

“Addendum-1”

1. Granular Sub Base:

Providing, laying, spreading and compacting specified grade Granular sub base coarse using specified stone dust, gravel or any other coarse granular materials of approved materials in sub base coarse including laying and compacting including spreading in uniform layers with Motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, watering and compacting with vibratory roller to achieve the density as directed by the Engineer- In-Charge at site of work.

2. Erection of Structural Steel

This specification covers the general requirements for erection of structural steel. In addition to provision of erection and transport equipment, the scope of work includes supply of tools and tackles, consumables, materials, labor and supervision and shall cover the following:

- Storing and staking of all fabricated structural components/units/assemblies at site storage yards till the time of erection.
- Transportation of structures from storage yard to site of erection, including multiple handling, if required.
- All minor rectifications/ modifications such as:-
 - i. Removal of bends, kinks, twists etc for parts damaged during transportation and handling
 - ii. Reaming of holes which do not fit properly, or which are damaged, for use of next higher size bolt.
 - iii. Plug-welding and re-drilling of holes which do not register, and which cannot be reamed for use of next higher size bolt.
 - iv. Drilling of holes which are either not drilled at all or are drilled in incorrect position during fabrication.
- Fabrication of minor missing items as directed by the Employer
- Verification of the position of embedded anchor bolts and inserts w.r.t lines and levels, installed by others based on Geodetic Scheme /Bench Mark/Reference co-ordinates to be furnished by Employer.
- Verification of actual dimensions of structures (erected by others) which would have bearing on the cutting lengths, end connections etc of those members which are to be erected under this scope of work.
- Assembly at site of steel structural components wherever required, including temporary supports and staging
- Making arrangements for providing all facilities for
 - i. Conducting Ultrasonic Testing (UT) by reputed testing laboratories approved by Employer.
 - ii. Making available test films / graphs, with reports / interpretation.
- Rectifying at site damaged portions of shop primer by cleaning and application touch-up paint.

- Erection of structures including making connections by bolts/ High strength Friction Grip bolts / welding as per drawing.
- Alignment of all structures true to line, plumb and dimensions within specified limits of tolerance.
- Application at site after erection, required number of coats of primer and finishing paint as per specification.
- Rectification of structures as per preliminary acceptance report and Final acceptance report.

All necessary items of work required for satisfactory completion of job on schedule.

2.1 APPLICABLE CODES STANDARDS & SPECIFICATIONS

The pertinent clauses of the following Indian Codes, Standards and Specification (latest editions including all applicable official amendments, reaffirmations and revisions) shall apply to the material and workmanship covered by this specification. In the event of the conflict of certain requirements between this specification and the codes referred herein, this specification shall govern. It is not the intent to specify herein all the codes and standards required for the satisfactory completion of work. The list of codes and standards indicates certain primary codes & standards and not all the codes required for the work under the contract. It is understood that all the pertinent codes and standards shall form the part of this specification whether explicitly indicated or not.

Reference codes and standards:

IS 800 General Constructions in Steel –Code of Practice.

IS 806 Code of Practice For Use Of Steel Tubes In General Building Construction.

IS 822 Code of Procedure for Inspection of Welds.

IS:1363 Hexagonal Head Bolts, screw and nut of Product grade C

IS:1367 Technical Supply Conditions for threaded fastener (all parts)

IS 4000 Code of Practice High strength bolts in Steel Structures.

IS 7205 Safety code for erection of structural steel

IS 7969 Safety code for handling and storage of building Materials

IS:9595 Metal Arc Welding of Carbon and Carbon manganese steel.

IS 12843 Tolerances for erection of steel structures.

SP:6(1) Structural Steel Sections.

AWS D1.1 Structural Welding Code: Steel

2.2 REGULATORY REQUIREMENTS

The work covered in this specification, shall comply with all relevant government and local laws, regulations and standards. For subjects not covered by regulations, codes, standards or specifications, the materials and construction shall be based on good engineering practice, subject to approval by EMPLOYER.

2.3 ERECTION SCHEME

CONTRACTOR after the award of work shall submit a detailed erection scheme covering the period of completion of all the works covered under the specification for ENGINEER's approval. The erection scheme shall include but not limited to the following.

- i. Methods proposed to be employed for transporting his equipment's, tools, tackles, gas

cylinders, electrodes and all that is necessary to site.

- ii. Type, capacity and quantity of equipment that the CONTRACTOR proposes to bring to site for unloading, transporting within the site, handling, assembling, hoisting and erecting of the structural steel components for all these operations.
- iii. Strength and trade wise composition of the work force and supervisory personnel that will be deployed by the CONTRACTOR for the various operations.
- iv. Any special specific scheme being adopted for erection of special / complicated structural elements such as roof trusses etc.

A brief write-up covering the above activities shall be submitted along with the bid document by the Bidder during submission of his bid. ENGINEER reserves the right to direct the CONTRACTOR either at the start or during the contract period, to mobilize additional resources in terms of labour, material, equipment, tools and plant etc at no cost to the EMPLOYER if in his opinion that the resources employed by the CONTRACTOR does not meet the schedule of completion.

2.2 ERECTION PROGRAMME

Within two (2) weeks of acceptance of bid the CONTRACTOR shall submit a detailed erection programme with dates and estimated completion time for various parts of the work for ENGINEER's approval. This programme shall broadly comprise the following:

- i. Layout plan identifying the areas proposed for unloading, main storage, Subsidiary storage and assembly
- ii. Transportation of fabricated material between the storage and work areas.
- iii. Layout to indicate the points at which proposed erection begins, direction in which it is proposed to progress, the deployment of equipment, access route for cranes to reach work areas, etc.
- iv. The locations and extent of site offices and stores, labor quarters if any.
- v. Layout of electrical cables and water pipes from the tap-off points.
- vi. Details of the method of handling, transport, hoisting and erection including false work/staging, temporary bracing, guying, etc. along with complete details of the quantity and capacity of the various items of erection equipment that will be used.
- vii. Site organization chart showing the number of supervisory personnel, and the number and composition of the various gangs.
- viii. Safety measures to be adopted at site of erection and organization chart showing safety personnel.

Any modifications to the erection programme directed by ENGINEER for the reasons of inadequacy of

- i. The quantity and/or capacity of the erection equipment.
- ii. Erection personnel and supervisors, temporary bracing, guying etc.,
- iii. Safety of the erection methods, or stability of the erected portions of structures, or unsuitability of the erection sequence due to interference with the work of other agencies.
- iv. Any other unforeseen events which may delay the schedule.
- v. Safety measures proposed.

Shall be incorporated by CONTRACTOR and the work shall be carried out in accordance with the revised programme. Approval by ENGINEER shall not relieve the CONTRACTOR from the responsibility for the safe, sound, accurate and timely erection of structural steel work as required by ENGINEER/EMPLOYER. CONTRACTOR shall also make no extra claims for bringing additional equipment to site for erection, if so directed by ENGINEER. CONTRACTOR shall be deemed to have visualized all erection problems while bidding for the work and no additional compensation shall be claimed on this account.

2.3 ACCEPTANCE, HANDLING AND STORAGE

The fabricated material received at erection site shall be verified with respect of marking on the key plan / marking plan or shipping list. Any material found damaged or defective shall be stacked separately and the damaged or defective material shall be painted in distinct colour for identification and the same shall be brought to the notice of ENGINEER. No dragging of steel shall be permitted. All fabricated items shall be stored 300mm above ground on suitable packing to avoid damage. It shall be stored in the order required for erection, with erection marks visible. All storage areas shall be prepared and maintained by CONTRACTOR. Steel shall not be stored in the vicinity of areas where excavation or grading will be done and, if so stored temporarily, this shall be removed by CONTRACTOR well before such excavation and/or grading commences to a safe distance to avoid burial under debris. Scratched or abraded steel shall be given a coat of primer in accordance with TCE specification M4-405-04 (painting of structural steel) after unloading and handling prior to erection. All milled and machined surfaces shall be properly protected from rust/corrosion by suitable coating and also from getting damaged.

2.4 ANCHOR BOLTS, EMBEDDED PARTS AND FOUNDATIONS

CONTRACTOR shall carefully check the location, level and layout of anchor bolts embedded in foundations constructed by others, to ensure that the structures can be properly erected as shown on the drawings. Any discrepancy in the anchor bolts/foundation shall be reported to ENGINEER. CONTRACTOR shall carefully check the actual dimensions of structures and also the location, level and sizes of embedded parts a) in the RC beam /column and/ or b) cleats / plates provided in steel beam /column constructed by others to receive structures covered under this scope of work. CONTRACTOR shall take note of discrepancies if any, shall be reported to ENGINEER and fabricate the structures covered under this contract suitably before the commencement of erection.

Levelling of column bases to the required elevation may be done either by providing shims or three nuts on the upper threaded portion of the anchor bolt. All shim stock required for keeping the specified thickness of grout and in connection with erection of structures on foundations, crane brackets or at any other locations shall be of good M.S. plates and shall be supplied by CONTRACTOR at his cost.

A certain amount of chipping/cleaning of foundations and preparing the area is considered normal and shall be carried out by CONTRACTOR at no extra cost. Where beams bear in pockets or on walls, bearing plates shall be set and levelled as part of the work. All grouting under column base plates or beam bearing plates will be carried out by CONTRACTOR, unless the grouting is specifically excluded from the CONTRACTOR's scope.

2.5 ASSEMBLY AND CONNECTIONS

Field connections may be affected either by bolting, welding or by use of high strength friction grip bolts as shown in the design and erection drawings. All bolts, nuts, washers, rivets, electrodes required for field connections shall be supplied by CONTRACTOR free of cost. The materials shall have prior approval from the EMPLOYER /ENGINEER and necessary test certificates shall be furnished to ENGINEER's approval.

Materials shall be procured from the reputed manufacturers with prior approval from EMPLOYER/ENGINEER All assembling shall be carried out on a level platform. Drifts shall be used only for drawing the work to proper position and must not be used to such an extent as to damage the holes. Size of drifts larger than the nominal diameter of hole shall not be used. Any damaged holes or burrs must be rectified to the satisfaction of ENGINEER.

Corrections of minor misfits and reasonable amount of reaming shall be considered as a part of erection. Any error in the shop, which prevents proper fit on a moderate amount of reaming and slight chipping or cutting, shall be immediately reported to ENGINEER.

2.6 ERECTION

Erection work shall be taken up after receipt of clearance from the ENGINEER. All structural steel shall be erected as per approved Design / fabrication drawings.

For safety requirements during erection, provisions of IS: 7205, IS:7969, IS800 and other relevant codes shall be strictly followed.

Erection shall be carried out with the help of maximum mechanization possible. Prior to commencement of erection, all the erection equipment, tools, tackles, ropes etc shall be tested for their load carrying capacity. Such tests may be repeated at intermediate stages also if considered necessary. Frequent visual inspection shall be done of all vulnerable areas and components to detect damages or distress in the erection equipments, if any. Temporary bracing, whenever required, shall be provided to sustain forces due to erection loads and equipment etc. Erected parts of the structure shall remain stable during all stages of erection when subjected to action of wind, dead weight and erection forces etc. Such bracings shall be left in place as long as may be required for safety and stability. Specified sequence of erection of vertical and horizontal structural members shall be followed Erected members shall be held securely in place by bolts to take care of dead load, wind /seismic load and erection load. All structural members shall be erected with erection marks in the same relative position as shown in the appropriate erection and shop drawings.

All connections shall achieve free expansion and contraction of structures wherever provided. No final bolting or welding of joints shall be done until the structure has been properly aligned and approved by ENGINEER. For positioning beams, columns and other steel members, the use of steel sledges is not permitted.

Instrumental checking of correctness of initial setting out of structures and adjustment of alignment shall be carried out in sequence and at different stages as required using precision survey instruments. The final levelling and alignment shall be carried out immediately after completion of each section of a building.

The CONTRACTOR shall design, manufacture, erect and provide false work, staging temporary support etc, Required for safe and accurate erection of structural steelwork and fully responsible for the adequacy of the same.

The CONTRACTOR shall also provide facilities such as adequate temporary access ladders, gangways, tools & tackles, instruments etc. to EMPLOYER for his inspection at any stage during erection.

Proper size steel cable slings, etc., shall be used for hoisting. Guys shall not be anchored to existing structures, foundations, etc. unless so permitted by ENGINEER in writing. Care shall be taken to see that ropes in use are always in good condition. Steel columns in the basement, if any, are to be lowered and erected carefully with the help of a crane and/or derrick without damaging the basement walls steel or floor.

Structural steel frames shall be erected plumb and true. Frames shall be lifted at such points that they are not liable to buckle and deform. Trusses shall be lifted only at node points. Trusses which are very slender in the lateral direction shall be provided with temporary lateral supports till the horizontal bracings are erected. All steel columns and beams shall be checked for plumb and level individually before and after connections are made.

Chequered plates shall be fixed to supporting members by welding or by countersunk bolts as shown/specified in relevant drawings and/or as directed by ENGINEER. The edges shall be made smooth and no burrs or jagged ends shall be left. While splicing, care should be taken so that there is continuity in pattern between the two portions. Care should also be taken to avoid distortion of the plate while welding. The erection of chequered plates shall include:

- a. Welding of stiffening angles/vertical stiffening ribs as per drawings
- b. Cutting to size and making holes to required shape wherever necessary to allow service lines such as piping, cables etc to pass through
- c. Splicing as shown in relevant drawings
- d. Smoothing of edges
- e. Fixing of chequered plates by welding and/or countersunk bolts
- f. Providing lifting hooks for ease of lifting.

Cutting, heating or enlarging holes may be carried out only with prior written Approval from the ENGINEER.

2.7 FIELD CONNECTIONS:

Assembly by Permanent Bolts:

- The number of washers on permanent bolts shall not be more than two (2) and not less than one (1) for the nuts and one (1) for the bolt head.
- Only wooden rams or mallet shall be used in forcing members into position in order to protect the metal from injury or shock.
- Where bolting is specified on the drawing, the bolts shall be tightened to the maximum limit.
- The threaded portion of each bolt shall project through the nut by at least one thread. Tapered washers shall be provided for all heads and nuts to achieve uniform bearing on sloping surface.
- To prevent loosening of nuts, spring washers or lock-nuts shall be provided as specified in the design / shop drawings.

- All machine fitted bolts shall be perfectly tight and the ends shall be checked to prevent nuts from becoming loose. No unfilled holes shall be left in any part of the structure.

ASSEMBLY BY WELDING:

- All field assembly by welding shall be executed in accordance with the requirements for shop fabrication. Where the steel has been delivered painted, the paint shall be removed before field welding for a distance of at least 50 mm on either side of the joints to be welded.
- All other requirements of welding and its acceptance standards shall be in accordance with clauses specified in TCE.M4-405-01(Supply and Fabrication of structural steel).

Assembly by High Strength Friction Grip Bolts (HSFG Bolts)

- Assembly of structures with HSFG bolts shall conform to IS:4000
- The mating surface shall be prepared in accordance with the requirements of design in order to achieve required properties to develop adequate friction between the surfaces.
- The mating surfaces shall be absolutely free from grease. Lubricant, dust, rust etc and shall be thoroughly cleaned before assembly. The nuts shall be tightened up to the specific torque with the help of torque wrench or by half-turn method with the help of pneumatic wrench lever.
- The direction of tightening of the nuts shall be from the middle towards the periphery of assembly.
- After desired tightening the bolt heads, nuts and edges of the mating surfaces shall be sealed with a coat of paint to obviate entry of moisture.
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2.8 INSPECTION

ENGINEER/EMPLOYER or their authorised representatives shall have free access to all parts of the job during erection and all erection shall be subjected to their approval. In case of faulty erection, all dismantling and re-erection required will be at CONTRACTOR's cost. No paint shall be applied to rivet heads or field welds or bolts until these have been approved by ENGINEER.

2.9 TOLERANCES

Tolerances mentioned below shall be achieved after the entire structure or part thereof is in line, level and plumb. The tolerances specified below do not apply to steel structures where the deviations from true position are intimately linked with and directly influence technological process. In such cases, the tolerances on erected steel structures shall be as per recommendations of process technologists/suppliers which will be indicated in the drawings.

COLUMNS

- Deviation of column axes at foundation top level with respect to true axes
 - (a) In longitudinal direction: ± 5 mm
 - (b) In lateral direction: ± 5 mm

- Deviation in the level of bearing surface of ± 5 mm

Columns at foundation top with respect to True level Out of plumbness (verticality) of column Axis from true vertical axis, as measured at Column top:

(a) For columns up to and including $15 \pm 1/1000$ of column height in mm or ± 15 mm Meters in height whichever is less.

(b) For columns exceeding 15 meters $\pm 1/1000$ of column height in mm or ± 20 mm in height Whichever is less.

Deviation in straightness in $\pm 1/1000$ of column height in mm or ± 10 mm Longitudinal and transverse planes of whichever is less. Column at any point along the height

Difference in erected position of adjacent Pairs of columns along length or across ± 10 mm Width of building prior to connecting width of building prior to connecting Trusses/beams with respect to true distance

Deviation in any bearing or seating level ± 5 mm with respect to true level

Deviation in differences in bearing levels of a member on adjacent pair of columns both ± 10 mm Across and along the building

TRUSSES AND BEAMS

Shift at the centre of span of top chord $\pm 1/250$ of height of truss in mm or ± 15 Member with respect to the vertical plane mm Whichever is less. Passing through the centre of bottom chord

Lateral shift of top chord of truss at the Centre of span from the vertical plane whichever $\pm 1/1500$ of span of truss in mm or ± 15 passing through the centre of support of the truss mm whichever is less

Lateral shift in location of truss from its true Vertical position ± 10 mm

Lateral shift in location of purlin true Position ± 5 mm

Deviation in difference of bearing levels of Trusses or beams from the true difference

i) ± 20 mm for trusses

ii) For beams:

Depth < 1800 mm: ± 6 mm

Depth > 1800 mm: ± 10 mm

Deviation in sag in chords and diagonals of Truss between node points $1/1500$ of length in mm or 10 mm whichever is smaller

Deviation in sweep of trusses, beams etc in $1/1000$ of span in mm subject The horizontal plane to a maximum of 10 mm

CRANE GIRDERS & RAILS

Shift in the centre line of crane rail with respect to centre line of web of crane girder ± 5 mm

Shift in plan of alignment of crane rail with respect to true axis of crane rail at any point ± 5 mm

Difference in alignment of crane rail in plan measured between any two points 2 ± 1 mm meters apart along rail

Deviation in crane track with respect to true gauge

(a) For track gauges up to and including ± 5 mm 15 meters

(b) For track gauges more than 15 Meters $\pm [5 + 0.25 (S-15)]$ where S in meters is true gauge

Deviation in the crane rail level at any Distance point from true level $1/1200$ of the gauge or ± 10 mm whichever is less

Difference in the crane rail actual levels Between any two points 2 meters apart Along the rail length ± 2 mm

- Difference in levels between crane track Rails at
 - (a) Supports of crane girders ± 15 mm
 - (b) Mid span of crane girders ± 20 mm 2 mm subject to grinding of surfaces
- Relative shift of crane rail surfaces at a smooth transition. joint in plan and elevation
- Relative shift in the location of crane stops end buffers) along the crane tracks with 1/1000 of track gauge S in mm subject to track gauge S in mm maximum of 20mm

2.10 PAINTING

After steel has been erected, all bare and abraded spots, field welds, bolt heads and nuts shall be spot painted. Before paint is applied, the surface shall be dry and free from dust, dirt, scale and grease.

2.11 CLEAN UP OF WORK SITE

During erection, the CONTRACTOR shall without any additional payment, at all times keep the working and storage areas used by him, free from accumulation of waste materials or rubbish. Before completion of erection, he shall remove or dispose of in a satisfactory manner all temporary structures, waste and debris and leave the premises in a condition satisfactory to EMPLOYER/ENGINEER.

2.12 PAINTING OF STRUCTURAL STEEL

- This specification covers the general requirements for shop and field painting for Structural Steel works using hot /cold rolled steel sections joined by using bolting and/or welding.
- Briefly the scope of works covered under this specification are;
 - i. Supply of all primers, paints and all other materials required for painting other than Employer's supply.
 - ii. Furnishing of all labor, materials, tools & equipment and the performance of all operations and incidentals necessary for surface preparation, painting, handling, storing, transporting, scaffolding etc.
 - iii. Testing of paints as per the relevant codes in the Standard Laboratory identified by the Employer and furnishing of required test certificates for Employer's approval.
 - iv. Repair work of damaged / pre-erection / fabrication shop primer and weld joints at field.
 - v. Inspection of painting system after its application to conform to the specification requirement.
 - vi. Any other requirement as required for satisfactory completion of specified work.
- Reference shall be made to Data Sheet-A for Paint system and Data Sheet-B for the structures covered in the scope of works.

2.13 EXCLUSIONS

This specification excludes paintings of the following structures /equipment. Mechanical & electrical equipment and parts.

- i. Buried & Overhead piping works
- ii. Storage tanks
- iii. Insulated parts

2.14 APPLICABLE CODES, STANDARDS

The pertinent clauses of the following Indian / International Codes, Standards And Specification (latest editions including all applicable official amendments, Reaffirmations and revisions) shall apply to the material and workmanship covered by this specification. In the event of the conflict of certain requirements between this specification and the codes referred herein, this specification shall govern.

It is not the intent to specify herein all the codes and standards required for the satisfactory completion of work. The list of codes and standards indicates certain primary codes & standards and not all the codes required for the work under the contract. It is understood that all the pertinent codes and standards shall form the part of this specification whether explicitly indicated or not.

Indian Standard Codes

1. IS:5 Colours for ready mixed paints and Enamels
2. IS:101 Methods of sampling and test for paints, varnishes and related products (all parts & all sections).
3. IS:104 Ready mixed paint, brushing, zinc chrome, priming
4. IS:158 Ready Mixed paint, Brushing, Bituminous, Black, Lead free, Acid, Alkali and heat resisting.
5. IS:1303 Glossary of Terms relating to paints
6. IS:1477 Code of practice for painting of ferrous metals in Buildings.
7. IS:2932 Enamel, synthetic, exterior:(a) undercoating (b) finishing- Specification
8. IS: 9954 Pictorial Surface Preparation Standards for Painting of Steel Surfaces.
9. IS:13183 Aluminium paint, Heat resistant-specification.
10. IS:2074 Ready Mixed Paint, Air Drying, Red Oxide Zinc Chrome, Priming -Specification.

International Standard Codes

- i. SSPC Society for Protective Coatings (USA) Volt I & II
- ii. NACE National Association of Corrosion Engineers, USA(NACE)
- iii. ISO 8501 Preparation of Steel Substrates before application of Paints and related products. Visual assessment of Surface cleanliness. (Part 1&2)
- iv. ISO 8502 Preparation of Steel Substrates before application of Paints and related products- Tests for assessment of Surface cleanliness. (Part 1-4)
- v. ISO 8503 Preparation of Steel Substrates before application of Paints and related products- Surface roughness Characteristics of blast-cleaned steel substrates. Part 1 & 2