

Corrigendum No. 2

Tender No: **MUM/N/EN/ROB/LC-130, date 29.09.2016**

Corrigendum No-2, dated 28.10.2016 for the work of "Construction of one ROB including approaches complete in lieu of existing LC no. 130 at KM 241/20-22 between Maroli - Navsari Railway station of Virar – Surat Section of Mumbai Division of Western Railway"

1. The schedule "A" had 32 items. Now item no. 19 (Original item no. 27006A) of Schedule "A" has been deleted from the schedule "A".

| S N | Item No. | Total Quantity | Item of work | Rate | Unit | Amount in Rs. |
|--------|-------------|-------------------|--|--------|------|------------------|
| 19 | 27006 A | 18900 | Backfill, Grading and compaction with selected backfill soil in layers in soil Reinforced works with peak internal angle of friction as per adopted design parameters, complete as per drawings and Technical specifications or as directed by engineer. | 907.99 | Cum | 17161011 |

The revised basic cost of Schedule "A" is Rs. 1,55,51,258.00/- (Original basic cost was Rs. 3,27,12,269.00/-)

2. Schedule "B" had 22 items. Now the new item no. 23 (State NS/23) has been introduced in schedule "B". The details of item is as under.

| S N | Item No. | Total Quantity | Item of work | Rate | Unit | Amount in Rs. |
|--------|----------------|-------------------|--|--------|------|------------------|
| 23 | State NS/23 | 18900 | Backfill, Grading and compaction with selected backfill soil in layers in soil Reinforced works with peak internal angle of friction as per adopted design parameters, complete as per drawings and Technical specifications or as directed by engineer. | 708.00 | Cum. | 13381200 |

The revised basic cost of Schedule "B" is Rs. 12,75,79,813/- (Original basic cost was Rs. 11,41,98,613.00/-)

3. Correction in item no. 5 (state NS/5) & 7 (state NS/7) are as follow:-

| SN | Item no. | Existing "Item of work" | Corrected "Item of work" |
|----|------------|--|---|
| 5 | State NS/5 | Providing and casting in-situ controlled cement concrete of M35 grade for RCC work for pile cap, pier, abutment, RCC stair case & retaining walls foundation with 20/40 mm down coarse aggregate of the required size for any depth including dewatering scaffolding centering, shuttering, mixing placing in position, consolidation with mechanical vibrators, curing, de-shuttering carefully, making good the damages, fixing embedment, insert, pockets wherever necessary as per specification and drawing. | Providing and casting in situ controlled concrete of M 35 grade for RCC work for pile cap, foundation of pier/ abutment/ RCC stair case/ retaining wall with 20/40 mm down coarse aggregate of the required size for any depth including dewatering scaffolding centering, shuttering, mixing placing in position, consolidation with mechanical vibrators, curing, de-shuttering carefully, making good the damages, fixing embedment, insert, pockets wherever necessary as per specification and drawing. |
| 7 | State NS/7 | Providing and casting in situ controlled cement M35 for RCC work in pier and abutment return wall as per drawing including centering shuttering scaffolding where necessary laying vibrating curing and finishing complete. A) Height from 0.0 to 5.0 m. | Providing and casting in situ controlled cement M35 for RCC work in pier and abutment return wall as per drawing including centering shuttering scaffolding where necessary laying vibrating curing and finishing complete. A) Height from 5.0 to 10.0 m. |

4. In the Technical Bid (Part A), under eligibility criteria at pate no. 32, (A) Technical eligibility criteria following changes are made in sl. No. 7 & 8 of (i),

| Existing criteria | Revised criteria |
|--|---|
| 7. Flyover on Roads having superstructure of RCC or PSC or Steel on at least one span. 8. Foot Over Bridge Over Railway Track | 7. Flyover on Roads having superstructure of RCC or PSC or Steel on at least one span. OR 8. Foot Over Bridge Over Railway Track |

5. In the PART- III (B), ADDITIONAL TECHNICAL SPECIFICATIONS – III, the detailed specification for item no. 23 (State NS/23) of schedule "B" of tender document is as under:

REINFORCED FILL SPECIFICATIONS

The reinforced fill shall be a select granular fill with the following properties:

- Peak drained or effective angle of friction of compacted fill (as per IS 2720: part 13) shall be minimum 28°.
- % fines (passing 75 micron sieve) shall be less than 15%. Sieve Analysis test shall performed as per IS 2720 (part 4),
Material with more than 15% passing 75 micron sieve, but less than 10% of particle smaller than 15 microns are acceptable provided PI is less than 6 and angle of friction is not less than 28°
- The fill material shall be free from organic and any other deleterious matter and shall not react adversely (chemically, electrically or biologically) with the reinforcement material and / or facia material.
- Liquid limit & Plastic Limit test shall performed as per IS 2720 (Part 5). Plasticity index shall be less than 6.
- Co-efficient of uniformity (Cu) shall be ≥ 2 .
- Top 500 mm of fill below Sub grade shall satisfy the effective CBR criteria with Sub grade material in addition to the above requirement.
- Recommended guidelines for gradation of the reinforced soil are given below:

| Sieve Size (mm) | % Finer |
|-----------------|---------|
| 75 | 100 |
| 4.75 | 85-100 |
| 0.425 | 60-90 |
| 0.075 | < 15 |

Plasticity Index (PI) shall not exceed 6 and $Cu > 2$

RETAINED FILL SPECIFICATIONS

- Peak drained or effective angle of friction of compacted fill (as per IS 2720: Part 13) shall be minimum of 30°.
- The fill shall be compacted to 95% of the maximum laboratory density obtained from modified protocol compaction test performed as per IS 2720 (Part 8)
- Fill within 0.5m of the bottom of pavement (sub grade) shall be compacted to a minimum of 98% of the MDD.
- The liquid limit and plasticity index (performed as per IS 2720: Part 5) of the fill shall be restricted to 40 and 20 respectively.
- The organic content shall be limited to 5% and the fill shall be free from deleterious matter.
- If Fly ash is used as retained fill then it shall be in conformity with IRC-SP 58. Top 500 mm of retained fill below Sub grade shall satisfy the effective CBR criteria with Sub grade material in addition to the above requirements.

DRAINAGE BAY

Drainage Bay shall be provided as shown in the approved drawings. The width of the drainage bay shall be 600 mm behind the facing element.

Backfill and drainage material to be separated by permeable non-oven geo textile.

TESTS FOR REINFORCED AND RETAINED FILL

The soil which is proposed to be used as reinforced fill shall be tested to ascertain the suitability for required quantity, grading, type and availability of required quantity etc. The soil to be used as retained fill behind the reinforced fill, in case it is not natural soil, shall be tested for its shear characteristics and permeability to evaluate earth pressure, drainage characteristics etc. for external stability of the wall.

The backfill is tested at two stages. The first stage is to ascertain the suitability of the fill while the second stage to ensure that the backfill envisaged in design is used during construction. To ascertain the suitability of the fill, samples should be drawn from the borrow area by drawing a grid of 25 m c/c to full depth, logging and sampling for ascertaining suitability of the borrow material as per MORTH 2013 Specifications. Following tests shall be carried out as per Indian Standards.

- i. Sieve Analysis - IS: 2720 Part - 2 tests per 3000 cum. of soil
- ii. Atterberg Limit Tests- IS: 2720 Part- 5-2 tests per 3000 cum. of soil
- iii. Compaction Tests - IS: 2720 relevant part corresponding to modified as well as Standard Proctor test - 2 tests per 3000 cum. of soil
- iv. Direct Shear Tests - IS: 2720 Part 13 & 39 to ascertain the peak angle of shearing resistance. The tests should be done at 95 percent of Modified Proctor Density at -2 percent of OMC at a frequency of 1 per 3000 cum. of fill.

During construction the quality control should be exercised by conducting one set of density test of 3000 sqm. of compacted area considering the importance of compaction in reinforced soil walls. (Clause 903.2.2 of MORTH 2013) One set shall consist of 6 tests. The density tests shall be carried out in accordance with IS-2720 Part 28. Density measurement by nuclear gauge may be carried out as an alternative. For such a test the number of tests per set shall be doubled. If the retained fill is borrowed tests mentioned above should be carried out at same frequency of reinforced fill. Frequency during construction shall be as per MORTH2013 Specifications.

DRAINAGE AGGREGATE

The drainage material shall consist of clean crushed stone or gravel with particle size gradation as shown below (as per IRC SP: 102- 2014)

Sieve Analysis test shall performed as per IS 2720 (Part 4) and one test is recommended per 250 cum of drainage material. Percentage passing through different size of sieve is given in the following table:

| Sieve size | %age finer |
|------------|------------|
| 37.5 mm | 90-100% |
| 20 mm | 80-100% |
| 12.50 mm | 0-20% |

Besides meeting gradation requirement it is to be ensured that the aggregates are not friable, flaky, elongated and are sound in strength.

Rate:

The Contract unit rates for the items of all labour, material, tools, equipment and incidentals necessary to complete the work to the Specifications & payment shall be done in Cum.

6. The revised total basic cost of tender is Rs. 27,65,28,860.00/- (Original basic cost of tender was Rs. 28,03,08,671.00/-).

7. Revision in EMD amount

Original EMD = Rs. 42,04,630.00/-

Revised EMD = Rs. 41,47,933.00/-