



::GUJARAT HIRA BOURSE::

Gem & Jewellery Park, Ichchhapore, Surat.

TENDER DOCUMENTS FOR

**CONSTRUCTION OF COMPOUND WALL FOR PLOT NO.11 OF GEM
& JEWELLERY PARK AT ICHCHHAPORE, TALUKA: CHORYASI,
DIST: SURAT ON ITEM RATE BASIS**

Volume-II

TECHNICAL BID

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Part - II Technical Bid

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Section - I

:: SPECIAL NOTE:-

All Indian Standards mentioned are to be considered as latest version available on the date of submission of financial bid". Specification of items for Civil Construction work for Building Works shall be referred as per State Government Specifications or/and as per CPWD Specifications-all Volumes of latest editions.

Specification for Civil Materials & Workmanship

1.0 Scope

This specification provides general requirements regarding quality, testing, handling, storing of materials required for civil construction.

All materials used in the construction shall conform to relevant Indian Standards (refer note above) or shall be of an approved quality equal to an approved sample manufactured by renowned concerns and shall bear prior approval of the engineer.

If any material is found defective or of non standard quality, the responsibility of risk shall devolve on the tenderer who shall replace such material with material of approved quality at his own cost.

2.0 Cement

General

The cement used shall be ordinary, low heat Portland cement to IS: 269 or Portland pozzolana cement to IS: 1489 or Portland blast furnace slag cement to IS: 455. (With latest amendment) and Brands as approved by Gujarat Hira Bourse.

Storage on the Site

The cement shall be stored in suitable weather tight store place/building and in such a manner as to permit easy access for proper inspection. The cement shall be stored in such a manner as to prevent deterioration due to moisture and to minimize warehouse deterioration.

Record Maintaining by Contractor

All accepted cement stored on the site shall be arranged in batches with the dates of receipts marked prominently and used in the same order as received from the manufacturer. The tenderer shall maintain a register of cement in which all entries shall be completed daily showing the quantities received, date of receipt, source of dispatch, type of cement etc. and also the daily cement consumption on site. This register shall be accessible to the engineer for his verification.

Rejection of Cement

Any cement which is considered defective by the engineer shall not be used and shall be promptly removed from the site of work by the tenderer at his own cost. The tenderer shall bear and will not be entitled for any compensation.

3.0 Aggregates

Coarse and fine aggregates shall conform in all respects to IS: 383 - Specification for Coarse and Fine Aggregates from Natural Sources. Aggregates obtained from a source shall be got approved by Engineer In Charge before use at site. Once the The source of aggregates shall be approved by the engineer and shall not be changed during the course of the job without his approval. It shall comply with the permissible limits of solids as mentioned in IS: 456. All materials will be got tested through approved Laboratory and then testing shall be carried out as per instruction of Engineer In charge.

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Sand/Fine Aggregates

All fine aggregate shall conform to IS: 383 and test for conformity shall be carried out as per IS: 2386 (Part I to VIII). The Contractor shall submit to the Engineer the entire information indicated in Appendix A of IS: 383. The fineness modulus of fine aggregate shall neither be less than 2.0 nor greater than 3.5. . Sand/fine aggregate for structural concrete shall conform to the requirement as relevant per IS.

4.0 Reinforcement

All reinforcement shall be free from loose mill scales loose rust and coats of paints, oil, mud or other coatings. Only tested steel reinforcement shall be use. The grade of steel shall be Fe:415 conforming to IS 1786 or FE 500. Approved Brand TMT steel will be brought at site. Test report of Steel shall be submitted by Contractor on demand by GHB.

5.0 Water

Water shall be arranged by the Tenderer at his own cost.

Water used for mixing and curing shall be clean and free from injurious amounts of oils, acids, alkalis, salts, sugar, organic materials or other substances that may be deleterious to concrete or steel. Potable water is generally considered satisfactory for mixing concrete.

6.0 Structural Steel

Material for various purposes shall confirm to the relevant Indian Standards IS:226.

Specification for Earthwork in Excavation and Filling

1.0 Scope

This specification provides general requirements of earthwork in excavation in all types of soils and rock and filling the areas with suitable earth for grading and site leveling, backfilling in foundations and transporting and disposal of surplus spoils or stacking them in suitable area. Excavation for boring of piles shall be carried out as per instruction of Engineer.

2.0 Earthwork in Foundation, Basements, Drains, Sewers, Culverts etc.

All excavation shall be neatly cut to lines, curves, and slopes and grades shown in the drawings or as directed by the Engineer. The tenderer shall make allowances for the working space required to carry out the subsequent construction portion. No working space will be considered for payment. PCC line shall be considered for measurements. Contractor shall consider his rates accordingly

The tenderer shall at his own cost provide, maintain and operate pumping equipment of required capacity and keep the area of construction free of water during concreting. Pumping shall be controlled and necessary care to dispose of the water through drainage, ditches without causing any inconvenience to construction operation shall be made.

All water from any source whatsoever getting accumulated in excavated areas, trenches, etc. shall be properly diverted in approved manner or bailed out or pumped by the tenderer at his own cost so that the areas and trenches are kept free of water.

The material obtained from excavation which is not considered suitable for filling operations shall be disposed off within the plot at a place and in a manner indicated by the Engineer.

The surplus suitable material obtained from excavation shall be used for back filling and for filling as directed by the Engineer.

Section III

Specification for Cement Concrete Works

1.0 Scope

This specification provides general requirements regarding mixing, placing, curing, testing of all grades of cast-in-situ and pre-cast cement concrete works including formwork, reinforcement, embedment, additives, etc.

For specification of materials, section VII Concreting shall be performed as per relevant Indian Standards IS:456 for Plain and Reinforced Concrete.

2.0 Grades

The designation of structural concrete grade shall be as follows, based on design mix.

Table-1

Grade designation	Specified characteristic compressive strength of 15 cm cube at 28 days.
M10	Cement Contents 225 Kg/Cum
M15	150 kg/cm ² Cement Contents 300 Kg/Cum
M20	200 kg/cm ² Cement Contents 375 Kg/Cum
M30	300 kg/cm ² Cement Contents 400 Kg/Cum

Slump

The slump for concrete as determined by slump test as per IS: 456 shall not exceed maximum slump for medium degree of workability between 50 to 100 for RCC work.

3.0 Mixing

The mixing of concrete shall be strictly carried out in an approved type of mechanical concrete mixer. The mixing equipment shall be capable of combining the aggregates, cement and water within the specified time into a thoroughly mixed and uniform mass and of discharging the mixture without segregation.

Hand Mixing

Normally, hand mixing of concrete shall not be permitted. However, this may be allowed by the Engineer-in-Charge in special cases (such as far away, isolated, small concreting). Ten percent (10%) extra cement shall have to be added to the normal mixes when mixed by hand. It shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. No extra payment shall be made to the tenderer for mixing by hand or for using extra cement due to hand mixing. However, cement consumed extra shall be considered for reconciliation purposes.

4.0 Placing

Engineer's approval for equipment and methods is essential for pouring & compaction of concrete.

The concrete shall in no case be dropped from a height of over 1.5m and it shall be carefully laid in position. Before depositing the concrete, all debris and dirt shall be removed from the space to be occupied by concrete. Concreting shall not be done unless the form work conforms to the shapes, lines and dimensions as shown in the drawings. The form work shall be sufficiently rigid. During the placing and compaction of concrete, care shall be taken to ensure that there is no loss of liquid from concrete and no segregation of aggregates takes place. The method of placing and compaction employed in any particular section of the work shall be to the entire satisfaction of the Engineer-in-Charge.

To ensure bond and water tightness between old concrete surfaces and be placed, surface shall be cleaned and roughened by "initial green brushing or chipping. The initial green

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cutting may be done after 6 hours of placing concrete in order to facilitate the work. Before plastering, the surface shall be thoroughly hacked. The bonding of old and new concrete shall be done by applying the cement slurry after thoroughly watering the old concrete surface and removing all free particles.

Unless otherwise approved, concrete shall be placed in single operation to the full thickness of slabs, beams and similar members and shall be placed in horizontal layers not exceeding 0.5 m deep in walls, columns and similar members. Concrete shall be placed continuously until completion of the part of the work between construction joints or as directed by Engineer-in-Charge.

Items embedded in concrete

Concreting shall not be started unless the electrical conduits or any other piping wherever required, are laid by the concerned agency.

Each layer of concrete shall be thoroughly compacted and fully worked around the reinforcement, around embedded fixtures and into corners of the form work with suitable type of equipment until the concrete has been consolidated to the maximum practicable density.

Type of vibrators

Concrete shall be compacted with mechanical vibrating equipment supplemented, if necessary to obtain consolidation by hand spading and tamping. The vibrators shall be the internal or immersion type high-frequency vibrators. Vibrators shall be used in sufficient number of units and power to properly consolidate all concrete.

5.0 Construction Expansion Joints

When the work is to be interrupted, horizontal and vertical construction joints and bonding keys shall be located and shall conform in detail to the requirements on the plans unless otherwise directed by the Engineer-in-Charge. Construction joints shall be provided in position as shown or described on the drawings. Where it is not described, the joints shall be in accordance with the following.

In a column, the joint shall be formed about 75 mm below the lowest soft fit of the beams framing into it. Concrete in a beam shall be placed throughout, without a joint but if the provision of a joint is unavoidable, the joint shall be vertical and at the middle of the span. Before fresh concrete is placed, the cement skin or any looser or porous material of partially hardened concrete shall be thoroughly removed and cut back until the solid face is exposed and surface made rough by hacking or any other method as directed by the Engineer-in-Charge. The rough surface shall be thoroughly wetted for about two hours and shall be dried and coated with 1: 1 freshly mixed cement sand slurry immediately before placing the new concrete. Special care shall be taken to see that the first layer of concrete placed after a construction joint is thoroughly rammed against the existing layer, before the slurry sets.

6.0 Curing

Curing of concrete shall be in accordance with IS: 456. Concrete shall be cured by keeping it moist for the period of time specified herein to ensure that complete hydration and hardening takes place. All concrete shall be cured by use of water which shall be continuously (not periodically) maintained on all exposed surfaces. Curing shall be assured by use of an ample water supply under pressure in pipes, with all necessary appliances of hose, sprinklers and spraying devices. Continuous fine-mist spraying or sprinkling shall be used, unless otherwise specified or approved by the Engineer-in-Charge.

Wherever, in the judgment of the Engineer-in-Charge it may be necessary, the continuous spray method may be omitted and a covering of sand or other approved material such as burlap which will hold moisture for long periods and prevent loss of moisture from the concrete shall be used. Type of covering which would stain disfigure or damage the concrete during and

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after the curing period shall not be approved. Approved covering shall be kept continuously wet during the specified curing period.

Concrete shall be maintained in moist condition for at least the first seven days after placing except that high early strength concrete shall be so maintained for at least the first three days. Other curing period may be used with the permission of the Engineer-in Charge, if the specified strengths are obtained.

7.0 Testing

Slump test of concrete

At least one slump test shall be made for every compressive strength test carried out. More frequent test shall be made if there is a distinct change in work conditions or if required by the Engineer-in-Charge.

Strength test of concrete

Samples from fresh concrete shall be taken as per IS: 1199 and cubes shall be made, cured and tested at 28 days in accordance with IS: 516.

Procedure - A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested, that is the sampling should be spread over the entire period of concreting and cover all mixing units.

Concrete is liable to be rejected if it is porous or honey-combed; its placing has been interrupted without providing a proper construction joint; the reinforcement has been displaced beyond the tolerances specified; or construction tolerances have not been met. However, the hardened concrete may be accepted after carrying out suitable remedial measures to the satisfaction of the Engineer-in-Charge.

8.0 Inspection

Immediately after stripping the form work, all concrete shall be carefully inspected and any defective work or small defects their removed or made good before concrete has thoroughly hardened.

In case of doubt regarding the grade of concrete used either due to poor workmanship or based on results of cube strength tests, compressive strength tests of concrete on the basis of core test and / or load test may be carried out.

9.0 Repair and replacement of unsatisfactory concrete

Concrete which is unsatisfactory shall be repaired by cutting out the unsatisfactory material and by replacing it with new concrete. Voids to be so filled shall be provided with anchors, keys or dovetail slots wherever necessary to attach the new material securely in place. Surface of prepared voids shall be wetted for 24 hours immediately before the patching material is placed. Repair of concrete shall be made by skilled workmen. Repairs shall be made as soon as practicable after removal of the forms and in a manner to meet the requirements for the finish specified for the particular location. The use of an epoxy for bonding fresh concrete used for repairs will be permitted on written approval of the Engineer-in-Charge. Epoxies shall be applied in strict accordance with the instructions of the manufacturer.

10.0 Form Work (Normal Finish)

Form for concrete shall be of plywood or steel or as directed by the Engineer-in- Charge and give smooth and even surface removal thereof.

If it is desired by the Engineer-in-Charge, the tenderer shall prepare, before commencement of actual work, design and drawings for formwork and centering and get them approved by the Engineer-in-Charge. The formwork shall conform to the shapes, lines and dimensions as shown on the drawings.

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The centering shall be true and rigid and adequately braced both horizontally and diagonally. The forms shall be sufficiently strong to carry without deformation of the dead weight of the concrete as a liquid as well as the working load, wind loads etc. Where the concrete is vibrated,

the form work shall be strong enough to withstand the effect of vibrations practically without any deflection, bulging, distortion or loosening of its components. All columns and floor slabs form work shall be of plywood or as specified finish. Form work for removable batch ways and plugs shall be installed in place wherever possible. All floor and beam centering shall be crowned not less than 8 mm in all directions for every 5m span.

Tie rods

Metal tie rods shall be used for supporting all forms. Provisions shall be made for removal of a section of each rod at surface of the concrete to a depth of approximately 50mm. All holes left by the removal of conical nuts or other removal fixtures embedded in the face of the concrete shall be filled and finished with cement mortar in a manner specified in the sections of "Finishing". Threaded inserts embedded on each face of the wall shall be used for attaching the forms to previously placed concrete.

Tie wires

Wire ties will be permitted only upon approval of the Engineer-in-Charge and when permitted, shall be cut off flush with the face of the concrete or counter sunk, filled and finished, as required by the Engineer-in-Charge in the manner specified under the sections of "Finishing".

Chamfers and fillets

All corners and angles shall be formed with 45 deg. moulding to form chamfers or fillets on the finished concrete. The standard dimensions of chamfers and fillets, unless otherwise detailed or specified, shall be 25 x 50 mm. For heavier work chamfers or fillets may be 40 x 50 mm. Care shall be exercised to ensure accurate moulding. The diagonal face of the moulding shall be planed or surfaced to the same texture as the form to which it is attached. Unit rates quoted shall include providing the chamfers as specified or as shown on the drawings.

Reuse of forms

Before reuse, all forms shall be thoroughly scrapped, cleaned, examined and when necessary, repaired and re oiled before resetting. Formwork shall not be used / reused, if declared unfit or un-serviceable by the Engineer-in-Charge.

Clean out provisions

Forms with limited working space within shall be provided with temporary cleanout doors or openings for cleaning, washing, blowing and removal of water, wood, chips, dirt, trash, etc.

Removal of forms

In the determination of time for removal of forms, consideration shall be given to the location and character of the structure, the weather and other conditions including the setting and curing of the concrete and materials used in the mix.

Forms and their supports shall not be removed without the approval of the Engineer-in-Charge. Methods of form removal likely to cause overstressing or damage to the concrete shall not be used. Supports shall be removed in such a manner as to permit the concrete to uniformly and gradually take the stress due to its own weight.

11.0 Exposed Concrete Work

Form work

Other things remaining same as above for normal formwork, formwork shall be with plywood or steel/Aluminum only. Care shall be taken to arrange the shutters so that the joints between shutter boards correspond with the pattern indicated in the drawings. The shuttering boards

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shall be butting with each other in straight lines. The joints between the boards shall cross in the two directions at right angles.

The size of boards shall be so selected as to exactly match with the pattern of shuttering impression on the concrete face indicated in the drawings. Maximum care shall be taken to make the formwork water tight. Burnt oil shall not be used. The tenderer shall be permitted reuse of concrete shuttering brought new on the work for exposed concrete work as per the following table.

Such reuses shall be permitted only if forms are properly cared for, stored and repaired after each use.

Plywood shuttering	- 8-10 reuses.
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The tenderer shall not be permitted to reuse any old shuttering, already used in work other than those covered under contract, for the purpose of exposed Concrete work.

Engineer-in-Charge/Architect may in their absolute discretion order removal of any forms be considers unfit for use in the work and order rejection of any form stored or erected, he considers unfit for use irrespective of the number of uses specified above.

Finishing

On striking the form work, the exposed surface shall be cleaned of extra mortar, grit, etc. by carefully chipping or rubbing by carborundum stone. Uniform texture and smooth surface shall be ensured. In case of honey-comb, the same shall be immediately brought to the notice of the Engineer-in-Charge. If it is allowed to be rectified, concrete in the affected area shall be carefully chipped off up to the depth of the concrete cover. The chipped off area shall be in rectangular shape enclosing the affected part. Cement concrete grout of 1: 1 1/2:3 or as specified by Engineer-in-Charge shall be used to patch up the chipped off area carefully using metal trowel to rub down the finished surface. Care shall be taken to use the same colour of cement as was used for the rest of the work, so that the repaired work merges with the rest of the concrete surface. If necessary, white cement in the ratio of 1:8 or as directed by the Engineer-in-Charge be mixed with the cement to obtain the matching colour.

The repaired patch shall be kept wet by covering with a piece of gunny bag from 2 hours after the work for 14 days, ensuring gunny bag piece remaining wet throughout the period.

Rendering or plastering the exposed concrete surface shall not be done.

12.0 Cement Wash

If so desired by the Engineer-in-Charge the tenderer shall provide one coat of cement wash over the concrete surfaces of foundations, pipe racks, columns, walls, etc. which are not covered. Cement used by the tenderer for providing the Cement wash shall be taken into account for material reconciliation. Cost of providing cement wash is deemed to have been included in the rate for various items of concreting in the Bill of Quantities.

13.0 Reinforcement

TMT bars from approved manufactures shall be brought with IS standard. All overlaps and dowels shall be kept with staggered manner as directed by Engineer in charge. All bars shall be bent in accordance with the Drawings. Actually used bars shall be measured and paid on weight basis.

Reinforcement shall be bent in accordance with procedure specified in IS: 2502 code of practice for Bending.

Cleaning, placing and fastening

All reinforcement shall be cleaned to ensure freedom from loose mill scale, loose rust, oil and grease or other harmful matter immediately before placing the concrete. Dowel bars will be

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provided where shown on drawings or where required. All steel reinforcement shall be accurately placed in position shown in the drawing and firmly held during the placing and setting of concrete. Bars shall be tied with annealed iron wire at all intersections except where spacing is less than 300 mm in each direction, when alternate intersections shall be tied.

Cover to reinforcement

Cover to reinforcement shall be as indicated on the drawings and in their absence as directed by the Engineer-in-Charge. Where concrete mortar blocks are used for giving necessary cover, strength shall correspond to the strength of concrete proposed for the structure where such cover blocks are used. All cover spacers shall be secured firmly so that they are not disturbed during vibration.

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Section IV

Approved List of Materials and Suppliers

All materials to be used in the work shall conform to technical specifications, relevant Indian Standard Specifications and wherever available ISI marked materials will be used. All material procured shall be subjected to relevant tests specified in B.I.S. at the frequency specified therein from any Government recognized laboratory. The list given below is only indicative and not restricted to brand mentioned. Other equivalent brand may be approved at the discretion of the Engineer-in-charge after verifying the quality thereof. The tenderers may suggest additional brand names if desired. The final selection will have to be done with the approval of Engineer-in-charge.

Make / Manufacturer / Brand of Materials

Item	Approved Make/Manufacturer
Cement	Ultratech, Ambuja 53 Grade (Major Plant)
White Cement	Birla, JK
TMT Bars	Tata, Sail, Vizag, Malhotra
Coarse Aggregates 6 mm to 25 mm sizes	Material should be as per specification & should be Angular blade trap stone aggregate Chikhali. Approved by EIC before use.
Shuttering Plywood	Anchor, Century, Green.(12 mm Film faced)
M.S. Boxes	Fabricated out of 16 gauge continuously welded (sample to be approved).

Developer with mutually agreed terms with Contractor may opt to procure shuttering plywood as required within tender specifications. In such circumstances, contractor shall give suppliers quotation to Developer.

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Section V

Certificate of Tenderer's inspection of the Drawing

I/Weof

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have inspected and studied all the drawings as in the below list of drawings..

I / We certify that I / We have obtained sufficient information from the drawings to enable me/us to fill in the tender for the proposed work of Construction of **Compound Wall for Plot no 11 of Gem & Jewellery Park, Ichchhapore, Surat.**

Signed byfor and on behalf of Tenderer.

Place :

Date :

Signature of the Tenderer.

Note:

The failure of a tenderer to inspect and study the drawings and collect adequate information will not relieve him / them from the responsibility for properly estimating the cost of the work / quoting rates and no claims from the tenderer / tenderer for additional cost on the ground that he / they is / are unfamiliar with the drawings will be entertained.

Signed byfor and on behalf of Tenderer.

Place :

Date :

Signature of Tenderer.

List of Working Drawings for Compound Wall

List of Drawings Attached		
Sr.No.	Description	Drawing No.
01	Lay Out Plan	GHB/CW/01
02	Plan & Elevation of Typical Compound Wall	GHB/CW/02
03	Details of Single Piles	GHB/CW/Single-1,2,3 /03 to 05
04	Details of Double Piles	GHB/CW/Double-1,2,3,4,5,6 / 06 to 11

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Section VI

Certificate of Tenderer's Visit to the Site

I, ofhave
visited the site and are well acquainted with the conditions of site related to access / approach at
site, topography , climatic conditions, availability of water and electricity and other basic necessities.

Signed

For and on Behalf of Tenderer,

Note:

The failure of the tenderer to visit the site and collect adequate information will not relieve him for
the responsibility for properly estimating the cost of work and no claims from the tenderer / tenderer
for additional cost on the ground that he is unfamiliar with the location and/ or nature of the site will
be entertained.

Signed

For and on Behalf of Tenderer,