



Republic of the Philippines
BANGSAMORO AUTONOMOUS REGION IN MUSLIM MINDANAO
OFFICE OF THE CHIEF MINISTER
BIDS AND AWARDS COMMITTEE

Bangsamoro Government Center, Governor Gutierrez Avenue, Rosary Heights VII, Cotabato City 9600

IN RE: COMPETITIVE PUBLIC BIDDING FOR THE CONSTRUCTION OF TWO (2)-UNIT TOWER OBSERVATORY SPACE FOR TELESCOPE OF THE BANGSAMORO DARU'L IFTA

ABC: PHP 1,810,610.00

IB NO.: BDI-022024-04

SUPPLEMENTAL BID BULLETIN NO. 2024-03-001

March 6, 2024/ Sha'ban 25, 1445 AH

Please be advised of the following clarifications and Modifications on the Bidding Documents:

SUBJECT	ORIGINAL	AMENDED																																										
1. Project Name	Construction Of Two (2)-Unit Tower Observatory Space for Telescope Of The Bangsamoro Daru'l Ifta	<u>Construction of Two (2)-Unit Tower Observatory Space for Telescope of the Bangsamoro Daru'l Ifta in Brgy. Lenik Dinaig, Datu Odin Sinsuat, Maguindanao del Norte, and Brgy. Polloc, Parang, Maguindanao del Norte</u>																																										
2. Key Personnel (Bid Data sheet clause 10.4)	<table border="1"> <thead> <tr> <th>Key Personnel</th> <th>General Experience</th> <th>Relevant Experience</th> </tr> </thead> <tbody> <tr> <td>1 Project Engineer</td> <td>Construction</td> <td>>3 years</td> </tr> <tr> <td>1 Material Engineer</td> <td>Material Testing</td> <td>>3 years</td> </tr> <tr> <td>1 Safety Officer</td> <td>Safety Management</td> <td>>2 years</td> </tr> <tr> <td>1 Construction Foreman</td> <td>Supervision</td> <td>>2 years</td> </tr> <tr> <td>3 Skilled Laborers</td> <td>Skilled Personnel</td> <td>>2 years</td> </tr> <tr> <td>1 Health Personnel</td> <td>Health in Construction</td> <td>>2years</td> </tr> </tbody> </table>	Key Personnel	General Experience	Relevant Experience	1 Project Engineer	Construction	>3 years	1 Material Engineer	Material Testing	>3 years	1 Safety Officer	Safety Management	>2 years	1 Construction Foreman	Supervision	>2 years	3 Skilled Laborers	Skilled Personnel	>2 years	1 Health Personnel	Health in Construction	>2years	<table border="1"> <thead> <tr> <th>Key Personnel</th> <th>General Experience</th> <th>Relevant Experience</th> </tr> </thead> <tbody> <tr> <td>1 Project Engineer</td> <td>Construction</td> <td>3 years</td> </tr> <tr> <td>1 Material Engineer</td> <td>Material Testing</td> <td>3 years</td> </tr> <tr> <td>2 Safety Officer</td> <td>Safety Management</td> <td>2 years</td> </tr> <tr> <td>2 Construction Foreman</td> <td>Supervision</td> <td>2 years</td> </tr> <tr> <td>6 Skilled Laborers</td> <td>Skilled Personnel</td> <td>2 years</td> </tr> <tr> <td>2 Health Personnel</td> <td>Health in Construction</td> <td>2years</td> </tr> </tbody> </table>	Key Personnel	General Experience	Relevant Experience	1 Project Engineer	Construction	3 years	1 Material Engineer	Material Testing	3 years	2 Safety Officer	Safety Management	2 years	2 Construction Foreman	Supervision	2 years	6 Skilled Laborers	Skilled Personnel	2 years	2 Health Personnel	Health in Construction	2years
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4. Section VI. Specifications	<u>See Annex A</u>					
5. Section VII. Drawings	<u>See Annex B</u>					
6. Section VIII. Bill of Quantities	<u>See Annex C</u>					

This Supplemental/Bid Bulletin is issued to modify or amend the corresponding items in the Bidding Documents.

For guidance and information of all concerned.

Originally signed

MOHD ASNIN K. PENDATUN

Chairperson, Bids and Awards Committee

Revised Project Name

**CONSTRUCTION OF TWO (2)-
UNIT TOWER OBSERVATORY
SPACE FOR TELESCOPE OF THE
BANGSAMORO DARU'L IFTA IN
BRGY. LENIK DINAIG, DATU
ODIN SINSUAT, MAGUINDANAO
DEL NORTE, AND BRGY.
POLLOC, PARANG,
MAGUINDANAO DEL NORTE**

Revised Bid Data Sheet

ITB Clause	
5.2	For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be: a. Construction of Tower Observatory Space or any other contracts

	<p>analogous thereto; and</p> <p>b. at least equivalent to the 50% of the ABC.</p> <p>However, contractors under Small A and Small B categories without similar experience on the contract to be bid may be allowed to bid if the cost of such contract is not more than the Allowable Range of Contract Cost (ARCC) of their registration based on the guidelines as prescribed by the PCAB.</p>																					
7.1	Not applicable.																					
10.3	<p>PCAB License Requirement is:</p> <p>Size Range : Small B License Category: C&D</p>																					
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15.1	<p>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:</p> <p>a. The amount of not less than two percent (2%) of the ABC for each LOT, if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit;</p>																					

	b. The amount of not less than five percent (5%) of the ABC for each LOT if bid security is in Surety Bond.
16	<p>Each Bidder are requested to submit one (1) original copy and two (2) certified true copies certified by the owner or its duly authorized representative whose full name and designation should be indicated below the signature.</p> <p>With respect to the documents those are emanating from the bidder should be originally signed by the owner or its duly authorized representative, to wit: Statement of all ongoing government and private contract, Statement of Single Largest Completed Contract, Bid Securing Declaration, Technical Specifications, Omnibus Sworn Statement, Net Financial Contracting Capacity, Bid Form, Bill of Quantities, Detailed Estimates including summary sheet, and Cash Flow by Quarter.</p> <p>Each bidder shall submit its bid proposal to a one mother envelope that shall contain 3 more envelopes containing 3 copies of its technical and financial documents. Each of the 3 envelopes shall contain two more envelopes labeled as technical and financial component. The envelopes must be properly and separately marked and sealed.</p>
19.2	Partial bids are not allowed.
21	<p>The following documents shall be submitted by the winning bidder within ten (10) calendar days from receipt of the Notice of Award:</p> <ol style="list-style-type: none"> 1. Program of Works 2. Manpower schedule; 3. Equipment/tools utilization schedule; 4. Construction safety and health program approved by MOLE; 5. S-Curve; and 6. PERT-CPM.

Annex A

Section VI. Specifications

TECHNICAL SPECIFICATIONS

1. SITE WORKS

1. 1.1 General

The Engineer will establish the limits of work and designate all trees, shrubs, plants and other things to remain. The Contractor shall preserve all objects designated to remain.

2. 1.2 Clearing and Grubbing

All surface objects and all trees, stumps, roots and other protruding obstructions, not designated to remain, shall be cleared and/or grubbed, including mowing as required, except as provided below:

- (1) Removal of undisturbed stumps and roots and nonperishable solid objects with a minimum of 900 mm (36 inches) below subgrade or slope of embankments will not be required.
- (2) In areas outside of the grading limits of cut and embankment areas, stumps, and nonperishable solid objects shall be cut off not more than 150 mm (6 inches) above the ground line or low water level.
- (3) In areas to be rounded at the top of cut slopes, stumps shall be cut off flush with or below the surface of the final slope line.
- (4) Grubbing of pits, channel changes, and ditches will be required only to the depth necessitated by the proposed excavation within such areas.

Except in areas to be excavated, stump holes and other holes from which obstructions are removed shall be backfilled with suitable material and compacted to the required density.

If perishable material is burned, it shall be burned under the constant supervision of competent watchmen at such times and in such a manner that the surrounding vegetation, other adjacent property, or anything designated to remain on the right of way will not be jeopardized.

Materials, debris and perishable materials may be disposed off by methods and at locations approved by the Engineer, on or off the subproject. If the disposal is by burying, the debris shall be placed with the material so disturbed so as to avoid nesting. The top layer of material buried shall be covered with at least 300 mm (12 inches) of earth or other approved material and shall be graded, shaped and compacted to present a pleasing appearance. If the disposal location is off the subproject the Contractor shall make all necessary arrangements with property owners in writing for obtaining suitable disposal locations which are outside the limits of view from the subproject. The Cost involved shall be included in the unit bid price. A copy of such agreement shall be furnished to the Engineer. The disposal areas shall be seeded, fertilized, and mulched at the Contractor's expense.

Woody material may be disposed off by chipping. The wood chips may be used for mulch, slope erosion control, or may be uniformly spread over selected areas as directed by the Engineer. Wood chips used as mulch for slope erosion control shall have a maximum thickness of 12 mm (1/2 inch) and faces not exceeding 3900 sq mm (6 square inches) on any individual surface area. Wood chips not designated for use under other sections shall be spread over the designated areas in layers not to exceed 75 mm (3 inches) loose thickness. Diseased trees shall be buried or disposed off as directed by the Engineer.

All merchantable timber in the clearing area that has not been removed from the right of way prior to the beginning of construction shall become the property of the Proponent/Beneficiaries, unless otherwise provided.

Low hanging branches and unsound or unsightly branches on trees or shrubs designated to remain shall be trimmed as directed. Branches of trees extending over the roadbed shall be

trimmed to give a clear height of 6 m (20 feet) above the roadbed surface. All trimming shall be done by skilled workmen and in accordance with good tree surgery practices.

Individual trees or stumps designated by the Engineer for removal and located in areas other than those established for clearing, grubbing and roadside cleanup shall be removed and disposed off except trees removed shall be cut as nearly flush with the ground as practicable without removing stumps.

All designated salvable material shall be removed, without unnecessary damage, in sections or pieces which may be readily transported, and shall be stored by the Contractor at specified places on the subproject or as otherwise shown in the Special Provisions. Perishable and non-perishable materials shall be handled as directed by the Engineer. Basements or cavities left by structure removal shall be filled with acceptable material to the level of the surrounding ground and, if within the prism of construction, shall be compacted to the required density.

2. EARTHWORKS

Prior to starting excavation operations in any area, all necessary clearing and grubbing in that area shall have been performed in conformance with Item 1, Clearing and Grubbing.

The Contractor shall notify the Engineer sufficiently in advance of the beginning of any excavation so that cross sectional elevations and measurements may be taken on the undisturbed ground. The natural ground adjacent to the structure shall not be disturbed without permission of the Engineer.

Trenches or foundation pits for structures or structure footings shall be excavated to the lines and grades or elevations shown on the Plans or as staked by the Engineer. They shall be of sufficient size to permit the placing of structures or structure footings of the full width and length shown. The elevations of the bottoms of footings, as shown on the Plans, shall be considered as approximate only and the Engineer may order, in writing, such changes in dimensions or elevations of footings as may be deemed necessary, to secure a satisfactory foundation. Boulders, logs, and other objectionable materials encountered in excavation shall be removed.

After each excavation is completed, the Contractor shall notify the Engineer to that effect and no footing, bedding material or pipe culvert shall be placed until the Engineer has approved the depth of excavation and the character of the foundation material.

3. 2.1 Roadway Excavation

Roadway excavation will include excavation and grading for roadways, parking areas, intersections, approaches, slope rounding, benching waterways and ditches; removal of unsuitable material from the roadbed and beneath embankment area; and excavating selected material found in the roadway as ordered by the Engineer for specific use in the improvement. Roadway excavation will be classified as "unclassified excavation", "rock excavation", "common excavations", or "muck excavation" as indicated in the Bill of Quantities and hereinafter described

(1) Unclassified Excavation. Unclassified excavation shall consist of the excavation and disposal of all materials regardless of its nature, or not classified and included in the Bill of Quantities under other pay item.

(2) Rock Excavation. Rock excavation shall consist of igneous, sedimentary, and metamorphic rock which cannot be excavated without blasting or the use of rippers, and all boulders or other detached stones each having a volume of 1 cubic meter or more as determined by physical measurements or visually by the Engineer.

(3) Common Excavation. Common excavations are those not included in the Bill of Quantities under "rock excavations" or other pay item.

(4) Muck Excavation. Muck excavation shall consist of the removal and disposal of deposits of saturated or unsaturated mixtures of soils and organic matter not suitable for foundation materials regardless of moisture content.

4. 2.2 Borrow Excavation

Borrow excavation shall consist of the excavation and utilization of approved material required for the construction of embankments or for other portions of the work, and shall be obtained from sources approved by the Engineer and the following:

(1) Borrow, Case 1. Borrow Case 1 will consist of material obtained from sources designated on the Plans or in the Special Provisions.

(2) Borrow, Case 2. Borrow, Case 2 will consist of material obtained from sources provided by the Contractor.

The material shall meet the quality requirements determined by the Engineer unless otherwise provided in the Contract.

2.3 Structure Excavation

This Item shall consist of the necessary excavation for foundations of bridges, culverts, underdrains, and other structures not otherwise provided for in the Specifications. Except as otherwise provided for pipe culverts, the backfilling of completed structures and the disposal of all excavated materials shall be in accordance with these Specifications and in reasonably close conformity with the Plans or as established by the Engineer.

This Item shall include necessary diverting of live streams, bailing, pumping, draining, sheeting, bracing, and the necessary construction of cribs and cofferdams, and furnishing the materials therefore, and the subsequent removal of cribs and cofferdams and the placing of all necessary backfill.

It shall also include the furnishing and placing of approved foundation fill material to replace unsuitable material encountered below the foundation elevation of structures.

No allowance will be made for classification of different types of material encountered.

2.3 Construction Requirements

5. 2.3.1 General

When there is evidence of discrepancies on the actual elevations and those shown on the Plans, a pre-construction survey referred to the datum plane used in the approved Plan shall be undertaken by the Contractor under the control of the Engineer to serve as basis for the computation of the actual volume of the excavated materials.

All excavations shall be finished to reasonably smooth and uniform surfaces. No materials shall be wasted without authority of the Engineer. Excavation operations shall be conducted so that material outside of the limits of slopes will not be disturbed. Prior to excavation, all necessary clearing and grubbing in that area shall have been performed.

6. 2.3.2 Conservation of Topsoil

Where provided for on the Plans or in the Special Provisions, suitable topsoil encountered in excavation and on areas where embankment is to be placed shall be removed to such extent and to such depth as the Engineer may direct. The removed topsoil shall be transported and deposited in Storage piles at locations approved by the Engineer. The topsoil shall be completely removed to the required depth from any designated area prior to the beginning of regular excavation or embankment work in the area and shall be kept separate from other excavated materials for later use.

7. 2.3.3 Utilization of Excavated Materials

All suitable material removed from the excavation shall be used in the formation of the embankment, subgrade, shoulders, slopes, bedding, and backfill for structures, and for other purposes shown on the Plans or as directed.

The Engineer will designate as unsuitable those soils that cannot be properly compacted in embankments. All unsuitable material shall be disposed off as shown on the Plans or as directed without delay by the Contractor.

Only approved materials shall be used in the construction of embankments and backfill. All unsuitable materials shall be disposed off as shown on the Plans or as directed.

All excess material, including rock and boulders that cannot be used in embankments, shall be disposed off as directed.

Material encountered in the excavation and determined by the Engineer as suitable for topping, road finishing, slope protection, or other purposes shall be conserved and utilized as directed by the Engineer.

Borrow material shall not be placed until after the readily accessible roadway excavation has been placed in the fill, unless otherwise permitted or directed by the Engineer. If the Contractor places more borrow than is required and thereby causes a waste of excavation, the amount of such waste will be deducted from the borrow volume.

8. 2.3.4 Pre-watering

Excavation areas and borrow pits may be pre-watered before excavating the material. When pre-watering is used, the areas to be excavated shall be moistened to the full depth, from the surface to the bottom of the excavation. The water shall be controlled so that the excavated material will contain the proper moisture to permit compaction to the specified density with the use of standard compacting equipment. Pre-watering shall be supplemented where necessary, by truck watering units to assure that the embankment material contains the proper moisture at the time of compaction.

The Contractor shall provide drilling equipment capable of suitably checking the moisture penetration to the full depth of the excavation.

9. 2.3.5 Presplitting

Unless otherwise provided in the Contract, rock excavation, which requires drilling and shooting, shall be presplit.

Presplitting to obtain faces in the rock and shale formations shall be performed by: (1) drilling holes at uniform intervals along the slope lines, (2) loading and stemming the holes with appropriate explosives and stemming material, and (3) detonating the holes simultaneously.

Prior to starting drilling operations for presplitting, the Contractor shall furnish the Engineer a plan outlining the position of all drill holes, depth of drilling, type and explosives to be used, loading pattern and sequence of firing. The drilling and blasting plan is for record purposes only and will not absolve the Contractor of his responsibility for using proper drilling and blasting procedures. Controlled blasting shall begin with a short test section of a length approved by the Engineer. The test section shall be presplit, production drilled and blasted, and sufficient material excavated whereby the Engineer can determine if the Contractor's methods are satisfactory. The Engineer may order discontinuance of the presplitting when he determines that the materials encountered have become unsuitable for being presplit.

The holes shall be charged with explosives of the size, kind, strength, and at the spacing suitable for the formations being presplit, and with stemming material which passes a 9.5 mm (3/8 inch) standard sieve and which has the qualities for proper confinement of the explosives.

The finished presplit slope shall be reasonably uniform and free of loose rock. Variance from the true plane of the excavated back slope shall not exceed 300 mm (12 inches). However, localized irregularities or surface variations that do not constitute a safety hazard or an impairment to drainage courses or facilities will be permitted.

A maximum offset of 600 mm (24 inches) will be permitted for a construction working bench at the bottom of each lift for use in drilling the next lower presplitting pattern.

10. 2.3.6 Excavation of Ditches, Gutters, etc.

All materials excavated from side ditches and gutters, channel changes, irrigation ditches, inlet and outlet ditches, toe ditches, furrow ditches, and such other ditches as may be designated on the Plans or staked by the Engineer.

Ditches shall conform to the slope, grade, and shape of the required cross-section, with no projections of roots, stumps, rock, or similar matter. The Contractor shall maintain and keep open and free from leaves, sticks, and other debris all ditches dug by him until final acceptance of the work.

Furrow ditches shall be formed by plowing a continuous furrow along the line staked by the Engineer. Methods other than plowing may be used if acceptable to the Engineer. The ditches shall be cleaned out by hand shovel work, by ditcher, or by some other suitable method, throwing all loose materials on the downhill side so that the bottom of the finished ditch shall be

approximately 450 mm (18 inches) below the crest of the loose material piled on the downhill side. Hand finish will not be required, but the flow lines shall be in satisfactory shape to provide drainage without overflow.

11. 2.3.7 Excavation of Roadbed Level

Rock shall be excavated to a depth of 150 mm (6 inches) below subgrade within the limits of the roadbed, and the excavation backfilled with material designated on the Plans or approved by the Engineer and compacted to the required density.

When excavation methods employed by the Contractor leave undrained pockets in the rock surface, the Contractor shall, at his own expense, properly drain such depressions or when permitted by the Engineer fill the depressions with approved impermeable material.

Material below subgrade, other than solid rock shall be thoroughly scarified to a depth of 150 mm (6 inches) and the moisture content increased or reduced, as necessary, to bring the material throughout this 150 mm layer to the moisture content suitable for maximum compaction. This layer shall then be compacted.

12. 2.3.8 Borrow Areas

The Contractor shall notify the Engineer sufficiently in advance of opening any borrow areas so that cross-section elevations and measurements of the ground after stripping may be taken, and the borrow material can be tested before being used. Sufficient time for testing the borrow material shall be allowed.

All borrow areas shall be bladed and left in such shape as to permit accurate measurements after excavation has been completed. The Contractor shall not excavate beyond the dimensions and elevations established, and no material shall be removed prior to the staking out and cross-sectioning of the site. The finished borrow areas shall be approximately true to line and grade established and specified and shall be finished as prescribed in these Specifications. When necessary to remove fencing, the fencing shall be replaced in at least as good condition as it was originally. The Contractor shall be responsible for the confinement of livestock when a portion of the fence is removed.

13. 2.3.9 Removal of Unsuitable Material

Where the Plans show the top portion of the roadbed to be selected topping, all unsuitable materials shall be excavated to the depth necessary for replacement of the selected topping to the required compacted thickness.

Where excavation to the finished graded section results in a subgrade or slopes of unsuitable soil, the Engineer may require the Contractor to remove the unsuitable material and backfill to the finished graded section with approved material. The Contractor shall conduct his operations in such a way that the Engineer can take the necessary cross-sectional measurements before the backfill is placed.

The excavation of muck shall be handled in a manner that will not permit the entrapment of muck within the backfill. The material used for backfilling up to the ground line or water level, whichever is higher, shall be rock or other suitable granular material selected from the roadway excavation, if available. If not available, suitable material shall be obtained from other approved sources. Unsuitable material removed shall be disposed off in designated areas shown on the Plans or approved by the Engineer.

2.3.10 Structures other than pipe culverts. All rock or other hard foundation materials shall be cleaned of all loose materials and cut to a firm surface, either level, stepped, or serrated as directed by the Engineer. All seams or crevices shall be cleaned and grouted. All loose and disintegrated rocks and thin strata shall be removed. When the footing is to rest on material other than rock, excavation to final grade shall not be made until just before the footing is to be placed. When the foundation material is soft or mucky or otherwise unsuitable, as determined by the Engineer, the Contractor shall remove the unsuitable material and backfill with approved granular material. This foundation fill shall be placed and compacted in 150 mm (6 inches) layers up to the foundation elevation.

When foundation piles are used the excavation of each pit shall be completed before the piles are driven and any placing of foundation fill shall be done after the piles are driven. After the driving is completed, all loose and displaced materials shall be removed, leaving a smooth, solid bed to receive the footing.

3. REINFORCEMENT BARS

3.1 Material Requirements

Unless otherwise specified the reinforcing steel bars shall meet the requirements AASHTO M 31 grade 33 (230mpa) testing shall be in accordance with AASHTO T-68 prior to deliver on site.

Steel reinforcement shall be stored above the surface of the ground, platform or other supports provided to make it free from mechanical injury and corrosion.

3.2 Construction Requirements

14. 3.2.1 Order Lists

Before materials are ordered, all order lists and bending diagrams shall be furnished by the Contractor, for approval of the Engineer. The approval of order lists and bending diagrams by the Engineer shall in no way relieve the Contractor of responsibility for the correctness of such lists and diagrams. Any expense incident to the revisions of materials furnished in accordance with such lists and diagrams to make them comply with the Plans shall be borne by the Contractor.

15. 3.2.2 Protection of Material

Steel reinforcement shall be stored above the surface of the ground upon platforms, skids, or other supports and shall be protected as far as practicable from mechanical injury and surface deterioration caused by exposure to conditions producing rust. When placed in the work, reinforcement shall be free from dirt, detrimental rust, loose scale, paint, grease, oil or other foreign materials. Reinforcement shall be free from injurious defects such as cracks and laminations. Rust, surface seams, surface irregularities, or mill scale will not be cause for rejection, provided the minimum dimensions, cross-sectional area and tensile properties of a hand wire brushed specimen meets the physical requirement for the size and grade of steel specified.

16. 3.2.3 Bending

All reinforcing bars requiring bending shall be cold-bent to the shapes shown on the Plans or required by the Engineer. Bars shall be bent around a circular pin having the following diameters (D) in relation to the diameter of the bar (d).

Nominal diameter (d), mm	Pin diameter (D)
10 to 20	6d
25 to 28	8d
32 and greater	10d

Bends and hooks in stirrups or ties may be bent to the diameter of the principal bar enclosed therein.

17. 3.2.4 Placing and Fastening

All steel reinforcement shall be accurately placed in the position shown on the Plans or required by the Engineer and firmly held there during the placing and setting of the concrete. Bars shall be tied at all intersections except where spacing is less than 300 mm in each direction, in which case, alternate intersections shall be tied. Ties shall be fastened on the inside.

Distance from the forms shall be maintained by means of stays, blocks, ties, hangers, or other approved supports, so that it does not vary from the position indicated on the Plans by more than 6 mm. Blocks for holding reinforcement from contact with the forms shall be precast mortar blocks of approved shapes and dimensions. Layers of bars shall be separated by precast mortar blocks or by other equally suitable devices. The use of pebbles, pieces of broken stone or brick, metal pipe and wooden blocks shall not be permitted. Unless otherwise shown on the Plans or required by the Engineer, the minimum distance between bars shall be 40 mm. Reinforcement in any member shall be placed and then inspected and approved by the Engineer before the placing of concrete begins. Concrete placed in violation of this provision may be rejected and removal may be required. If fabric reinforcement is shipped in rolls, it shall be straightened before being placed. Bundled bars shall be tied together at not more than 1.8 m intervals.

18. 3.2.5 Splicing

All reinforcement shall be furnished in the full lengths indicated on the Plans. Splicing of bars, except where shown on the Plans, will not be permitted without the written approval of the Engineer. Splices shall be staggered as far as possible and with a minimum separation of not less

than 40 bar diameters. Not more than one-third of the bars may be spliced in the same cross-section, except where shown on the Plans.

Unless otherwise shown on the Plans, bars shall be lapped a minimum distance of.

Splice Type	Grade 33 minimum lap	Grade 40 minimum lap	But not less than
Tension	24 bar dia	36 bar dia	300 mm
Compression	20 bar dia	24 bar dia	300 mm

In lapped splices, the bars shall be placed in contact and wired together. Lapped splices will not be permitted at locations where the concrete section is insufficient to provide minimum clear distance of one and one-third the maximum size of course aggregate between the splice and the nearest adjacent bar. Welding of reinforcing, steel shall be done only if detailed on the Plans or if authorized by the Engineer in writing. Spiral reinforcement shall be spliced by lapping at least one and a half turns or by butt welding unless otherwise shown on the Plans.

19. 3.2.6 Lapping of Bar Mat

Sheets of mesh or bar mat reinforcement shall overlap each other sufficiently to maintain a uniform strength and shall be securely fastened at the end and edges. The overlap shall not be less than one mesh in width.

4. CONCRETE WORKS

4.1 Structural Concrete

This Item shall consist of furnishing, placing, and finishing concrete in all structures except pavements in accordance with this Specification and conforming to the lines, grades, and dimensions shown on the Plans. Concrete shall consist of a mixture of Portland Cement, fine aggregate, coarse aggregate, admixtures when specified, and water mixed in the proportions specified or approved by the Engineer.

20. 4.2 Classes and Uses of Concrete

Five classes of concrete are provided for in this Item, namely: A, B, C, P, and Seal. Each class shall be used in that part of the structure as called for on the Plans.

The classes of concrete will generally be used as follows.

Class A - All superstructures and heavily reinforced substructures. The important parts of the structure included are slabs, beams, girders, columns, arch ribs, box culverts, reinforced abutments, retaining walls, reinforced footings, and large-diameter cast-in-place reinforced concrete piles (bored piles).

Class B - Footings, pedestals, massive pier shafts, pipe bedding, and gravity walls, unreinforced or with only a small amount of reinforcement.

Class C - Thin reinforced sections, railings, precast R. C. piles and cribbing, and for filler in steel grid floors.

Class P - Pre-stressed concrete structures and members.

Seal - Concrete deposited in water.

4.3 Material Requirements

21. 4.3.1 Portland Cement

22. The cement shall be Portland cement Type I, complying in all respects with ASTM C150 (AASHTO M85). All cement shall be manufacturer's standard grey cement unless otherwise specified on the Drawings. One brand of cement as approved by the Engineer shall be used for all concrete works throughout the project unless otherwise authorized by the Engineer in writing.

23. 4.3.2 Fine Aggregate

24. Fine aggregates shall be river-run, clean, hard course river sand or crushed river sand free from injurious amount of clay, loam and/or other vegetable.

25. 4.3.3 Coarse Aggregate

The gradation of the coarse aggregate shall conform to Table 4.3.3.

Table 4.3.3 - Grading Requirements for Coarse Aggregate

Sieve Designation		Mass Percent Passing				
Standard mm	Alternate US Standard	Class A	Class B	Class C	Class P	Class Seal

63	2 ½ "		100			
50	2"	100	95-100			
37.5	1 ½ "	95-100	-			100
25	1"	-	35-70	100	100	95-100
19.0	¾ "	35-70	-	100	95-100	-
12.5	½ "	-	10-30	90-100	-	25-60
9.5	3/8"	10-30	-	40-70	20-55	-
4.75	No. 4	0-5	0-5	0-15*	0-10*	0-10*

*The measured cement content shall be within plus or minus 2 mass percent of the design cement content.

4.3.4 Reinforcing steel

It shall conform to the requirements set in Item 3.

4.3.5 Water

Water shall be clean, potable and free from deleterious amount of acids, alkalis, oil or other organic matter.

4.4 Production Requirements

26. 4.4.1 Proportioning and Strength of Structural Concrete

The concrete materials shall be proportioned in accordance with the requirements for each class of concrete as specified in Table 4.4.1, using the absolute volume method as outlined in the American Concrete Institute (ACI) Standard 211.1, "Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete". Other methods of proportioning may be employed in the mix design with prior approval of the Engineer. The mix shall either be designed or approved by the Engineer. A change in the source of materials during the progress of work may necessitate a new mix design.

Table 4.4.1 - Composition and Strength of Concrete for Use in Structures

Class of Concrete	Minimum Cement Content per m ³	Maximum Water/Cement Ratio	Consistency Range in Slump	Designated Size of coarse Aggregate	Minimum Compressive Strength of 150 x300 mm concrete cylinder specimen at 28 days
	kg (bag**)	kg/kg	mm (inch)	Square Opening Std. mm	MN/m ² (psi)
A	360 (9 bags)	0.53	50-100 (2-4)	37.5-4.75 (1½" -No. 4)	20.7 (3000)
B	320 (8 bags)	0.58	50-100 (2-4)	50-4.75 (2"-No.4)	16.5 (2400)
C	380 (9.5 bags)	0.55	50-100 (2-4)	12.5-4.75 (½" -No. 4)	20.7 (3000)
P	440 (11 bags)	0.49	100 max. (4 max.)	19.0-4.75 (¾" -No. 4)	37.7 (5000)
Seal	380 (9.5 bags)	0.58	100-200 (4-8)	25-4.75 (1" -No. 4)	20.7 (3000)

* The measured cement content shall be within plus or minus 2 mass percent of the design cement content.

** Based on 40 kg bag

In any case, strength of the sample tested is accounted. Admixture is applicable if necessary to attain the specified strength. As work progresses, at least one(1) set consisting of four (4) concrete cylinder test specimens shall be obtained per class of concrete or as directed by the Engineer. The cylinder shall be prepared, cured and tested at the specified date. A minimum

compressive strength of 2130 psi is required for 7 day strength of trial mix sample in order to proceed the casting to any concrete works. Structures represented by concrete cylinder sample deficient by more than 10 percent of its required strength are subject for removal and replacement at Sub-Contractor's expense. Remove and replace for concrete below 2700 psi after 28th days.

Concrete shall have a consistency such that it will be workable in the required position and will flow around reinforcing steel. The reasonable range of slump for various type of concrete construction is as shown below:

<i>Class of Concrete</i>	<i>Consistency Range in Slump, mm (inch)</i>
<i>A</i>	<i>50-100 (2-4)</i>
<i>B</i>	<i>50-100 (2-4)</i>
<i>Seal</i>	<i>100-200(4-8)</i>

4.4.2 Mixing Concrete: General

Concrete shall be thoroughly mixed in a mixer of an approved size and type that will insure a uniform distribution of the materials throughout the mass.

All concrete shall be mixed in mechanically operated mixers. No hand mixing shall be allowed. Mixing plant and equipment for transporting and placing concrete shall be arranged with an ample auxiliary installation to provide a minimum supply of concrete in case of breakdown of machinery or in case the normal supply of concrete is disrupted. The auxiliary supply of concrete shall be sufficient to complete the casting of a section up to a construction joint that will meet the approval of the Engineer.

Equipment having components made of aluminum or magnesium alloys, which would have contact with plastic concrete during mixing, transporting, or pumping of Portland Cement concrete shall not be used.

Concrete mixers shall be equipped with adequate water storage and a device for accurately measuring and automatically controlling the amount of water used.

Materials shall be measured by weighing. The apparatus provided for weighing the aggregates and cement shall be suitably designed and constructed for this purpose. The accuracy of all weighing devices except that for water shall be such that successive quantities can be measured to within one percent of the desired amounts. The water measuring device shall be accurate to plus or minus 0.5 mass percent. All measuring devices shall be subject to the approval of the Engineer. Scales and measuring devices shall be tested at the expense of the Contractor as frequently as the Engineer may deem necessary to insure their accuracy.

Weighing equipment shall be insulated against vibration or movement of other operating equipment in the plant. When the entire plant is running, the scale reading at cut-off shall not vary from the weight designated by the Engineer more than one mass percent for cement, 1½ mass percent for any size of aggregate, or one mass percent for the total aggregate in any batch.

Concrete mixers may be of the revolving drum or the revolving blade type. The mixing drum or blades shall be operated uniformly at the mixing speed recommended by the manufacturer. The pick-up and throw-over blades of mixers shall be restored or replaced when any part of section is worn 20 mm or more below the original height of the manufacturer's design. Mixers and agitators which have an accumulation of hard concrete or mortar shall not be used.

When bulk cement is used and volume of the batch is 0.5 m³ or more, the scale and weigh hopper for Portland cement shall be separate and distinct from the aggregate hopper or hoppers. The discharge mechanism of the bulk cement weigh hopper shall be interlocked against opening before the full amount of cement is in the hopper. The discharging mechanism shall also be interlocked against opening when the amount of cement in the hopper is underweight by more than one mass percent or overweight by more than 3 mass percent of the amount specified.

When the aggregate contains more water than the quantity necessary to produce a saturated surface dry condition, representative samples shall be taken and the moisture content determined for each kind of aggregate.

The batch shall be charged into the mixer so that some water will enter in advance of cement and aggregate. All water shall be in the drum by the end of the first quarter of the specified mixing time.

Cement shall be batched and charged into the mixer so that it will not result in loss of cement due to the effect of wind, or in accumulation of cement on surfaces of conveyors or hoppers, or in other conditions which reduce or vary the required quantity of cement in the concrete mixture.

The entire content of a batch mixer shall be removed from the drum before materials for a succeeding batch are placed therein. The materials composing a batch, except water, shall be deposited simultaneously into the mixer.

All concrete shall be mixed for a period of not less than 1½ minutes after all materials, including water, are in the mixer. During the period of mixing, the mixer shall operate at the speed for which it has been designed.

Mixers shall be operated with an automatic timing device that can be locked by the Engineer. The time device and discharge mechanics shall be so interlocked that during normal operation no part of the batch will be discharged until the specified mixing time has elapsed.

The first batch of concrete materials placed in the mixer shall contain a sufficient excess of cement, sand, and water to coat the inside of the drum without reducing the required mortar content of the mix. When mixing is to cease for a period of one hour or more, the mixer shall be thoroughly cleaned.

As the program calls to generate local labor employment, concrete mixing shall be with the use of one-bagger mixer and shall be continued at least 1 ½ min. after all materials are in the mixing drum.

27. 4.4.3 Curing Concrete

All newly placed concrete shall be cured in accordance with this Specification unless otherwise directed by the Engineer. The curing method shall be one or more of the following.

Thru a "water method", the concrete shall be kept continuously wet by the application of water for a minimum period of **7 days** after the concrete has been placed.

The entire surface of the concrete shall be kept damp by applying water with an atomizing nozzle. Cotton mats, rugs, carpets, or earth or sand blankets maybe used to retain the moisture. At the expiration of the curing period the concrete surface shall be cleared of the curing medium.

The curing compound method may be used on concrete surfaces which are to be buried underground, surfaces where only Ordinary Surface Finish is to be applied and on which a uniform color is not required, and which will not be visible from public view.

The top surface of highway bridge decks shall be cured by either the curing compound method or the water method. The compound curing shall be applied progressively during the deck finishing operations. The water cure shall be applied not later than 4 hours after completion of the deck finishing.

When deemed necessary by the Engineer during periods of hot weather, water shall be applied to concrete surface being cured by the curing compound method or by the forms-in-place method until the Engineer determines that a cooling effect is no longer required.

Thru a "Waterproof Membrane Method", the exposed finished surfaces of concrete shall be sprayed with water using a nozzle that atomizes the flow so that a mist and not a spray is formed until the concrete has set, after which a curing membrane of waterproof paper or plastic sheeting shall be placed. The curing membrane shall remain in place for a period of not less than 72 hours. Waterproof paper and plastic sheeting shall conform to the specification of AASHTO M 171. The waterproof paper or plastic sheeting shall be formed into sheets of such width as to cover completely the entire concrete surface.

All joints in the sheets shall be securely cemented together in such a manner as to provide a waterproof joint. The joint seams shall have a minimum lap of 100 mm.

The sheets shall be securely weighed down by placing a bank of earth on the edges of the sheets or by other means satisfactory to the Engineer.

Should any portion of the sheets be broken or damaged within 72 hours after being placed, the broken or damaged portions shall be immediately repaired with new sheets properly cemented into place.

In sections of membrane which have lost their waterproof qualities or have been damaged to such an extent as to render them unfit for curing, the concrete shall not be used.

If the "Forms-in-place method" will be adopted, formed surfaces of concrete may be cured by retaining the form in place. The forms shall remain in place for a minimum period of 7 days after the concrete has been placed, except that for members over 50 cm in least dimensions, the forms

shall remain in place for a minimum period of 5 days. Wooden forms shall be kept wet by watering during the curing period.

28. 4.4.4 Construction Joints

Construction joints shall be made only where shown on the Plans or called for in the pouring schedule, unless otherwise approved by the Engineer. Shear keys or reinforcement shall be used, unless otherwise specified, to transmit shear or to bond the two sections together.

Before depositing new concrete on or against concrete which has hardened, the forms shall be retightened. The surface of the hardened concrete shall be roughened as required by the Engineer, in a manner that will not leave loose particles of aggregate or damage concrete at the surface. It shall be thoroughly cleaned of foreign matter and laitance. When directed by the Engineer, the surface of the hardened concrete which will be in contact with new concrete shall be washed with water to his satisfaction. To ensure an excess of mortar at the juncture of the hardened and the newly deposited concrete, the cleaned and saturated surfaces, including vertical and inclined surfaces, shall first be thoroughly covered with a coating of mortar of the same proportion of sand and cement as the class of concrete used against which the new concrete shall be placed before the grout or mortar has attained its initial set.

The placing of concrete shall be carried continuously from joint to joint. The face edges of all joints which are exposed to view shall be carefully finished true to line and elevation.

29. 4.4.5 Compaction of Concrete

Concrete during and immediately after placing shall be thoroughly compacted. The concrete in walls, beams, columns, and the like shall be placed in horizontal layers not more than 30 cm thick except as hereinafter provided. When less than a complete layer is placed in one operation, it shall be terminated in a vertical bulkhead. Each layer shall be placed and compacted before the preceding layer has taken initial set to prevent injury to the green concrete and avoid surfaces of separation between the layers. Each layer shall be compacted so as to avoid the formation of a construction joint with a preceding layer.

The compaction shall be done by mechanical vibration. The concrete shall be vibrated internally unless special authorization of other methods is given by the Engineer or is provided herein. Vibrators shall be of a type, design, and frequency approved by the Engineer. The intensity of vibration shall be such as to visibly affect a mass of concrete with a 3 cm slump over a radius of at least 50 cm. A sufficient number of vibrators shall be provided to compact each batch properly immediately after it is placed in the forms. Vibrators shall be manipulated so as to thoroughly work the concrete thoroughly around the reinforcement and embedded fixtures and into the corners and angles of the forms. It shall be applied at the point of placing and in the area of friable placed concrete. The vibrators shall be inserted into and withdrawn from the concrete slowly. The vibration shall be of sufficient duration and intensity to compact the concrete thoroughly but shall not be continued so as to cause segregation at any one point to the extent that localized areas of grout are formed. Application of vibrators shall be at points uniformly spaced and not farther apart than twice the radius over which the vibration is visibly effective. Vibration shall not be applied directly or through the reinforcement to sections or layers of concrete that have hardened to the degree that the concrete ceases to be plastic under vibration. It shall not be used to make concrete flow in the forms over distances so great as to cause segregation, and vibrators shall not be used to transport concrete in the forms of troughs or chutes.

4.4.6 Placing Concrete in Water

Concrete shall not be placed in water except with the approval of the Engineer and under his immediate supervision. In this case the method of placing shall be hereinafter specified.

Concrete deposited in water shall be Class A concrete with a minimum cement content of 400 kg/m³ of concrete. The slump of the concrete shall be maintained between 10 and 20 cm. To prevent segregation, concrete shall be carefully placed in a compact mass, in its final position, by means of a tremie, a bottom-dump bucket, or other approved means, and shall not be disturbed after being placed.

A "tremie" shall consist of a tube having a diameter of not less than 250 mm constructed in sections having flanged couplings fitted with gaskets with a hopper at the top. The tremie shall be supported so as to permit free movement of the discharge and over the entire top surface of the work and so as to permit rapid lowering when necessary to retard or stop the flow of concrete. The discharge end shall be closed at the start of work so as to prevent water entering the tube and shall be completely submerged in concrete at all times. The tremie tube shall be kept full to

the bottom of the hopper. When a batch is dumped into the hopper, the flow of concrete shall be induced by lightly raising the discharge end, but always kept in the placed concrete. The flow shall be continuous until the work is completed.

When the concrete is placed with a bottom-dump bucket, the top of the bucket shall be open. The bottom doors shall open freely downward and outward when tripped. The buckets shall be completely filled and slowly lowered to avoid backwash. It shall not be dumped until it rests on the surface upon which the concrete is to be deposited and when discharged shall be withdrawn slowly until well above the concrete.

30. 4.4.7 Casting Sections and Construction Joints

The concrete in each form shall be placed continuously. Placing of concrete on any such form shall not be allowed to commence unless sufficiently inspected, approved materials for the concrete are at hand, and labor and equipment are sufficient to complete the pour without interruption.

Joints in the concrete due to stopping work shall be avoided as much as possible. Such joints when necessary shall be constructed to meet the approval of the Engineer.

When the placing of concrete is temporarily discontinued, the concrete, after becoming firm enough to retain its shape, shall be cleaned of laitance and other objectionable material to a sufficient depth to expose sound concrete. Where a "faster edge" might be produced at a construction joint, as in the sloped top surface of a wingwall, an inset formwork shall be used to produce an edge thickness of not less than 15 cm in the succeeding layer. Work shall not be discontinued within 50 cm of the top of any face, unless provision has been made for a coping less than 50 cm thick, in which case if permitted by the Engineer, the construction joint may be made at the underside of coping.

Immediately following the discontinuance of placing concrete, all accumulations of mortar splashed upon the reinforcing steel and the surfaces of forms shall be removed. Dried mortar chips and dust shall not be puddled into the unset concrete. Care shall be exercised during the cleaning of the reinforcing steel not to injure or break the concrete steel bond at or near the surface of the concrete.

5. SIGNAGES

5.1 Project Signage

Within one (1) week from commencement of project implementation, contractor shall provide one temporary signboard at the project site. The signboard will be temporary erected using coco lumber as frame. Lay-out will be provided by MAFAR REGIONAL ENGINEERING SECTION.

Detailed in the engineering drawing, a permanent signboard shall be firmly attached to two (2) pedestals. Lay-out will be provided by MAFAR REGIONAL ENGINEERING SECTION..

6. PROJECT SAFETY

6.1 Temporary Protection of Streets and Sidewalks

Protection of streets, private roads and sidewalks shall be maintained them during the course of the work. In the event of damages incurred as cause of undertaking works, repair of the damages shall immediately be done.

The works must comply with local rules and regulations in connection with the use of streets.

6.2 Job Safety

The formulation and enforcement of an adequate safety program shall be the obligation of the Contractor with respect to all work under this contract.

The Contractor shall, as soon as practicable after commencement of the work, meet with the Engineer to present and discuss his plan for the establishment of such safety measures as may be necessary to provide all guard rails, barriers, or any other form of special protection to adjoining property, persons, vehicles and the like from injury and shall provide adequate barriers and other protection necessary to protect the general public.

6.3 Housekeeping

During the period of construction activity the contractor shall maintain the Works free from accumulation of Waste and surplus materials, rubbish, tools, equipment and machinery shall be removed, all sight-exposed surfaces shall be cleaned. The Contractor must ensure to:

- Execute regular cleaning to ensure that the site works, structures and accommodation quarters, are maintained free from accumulation of waste materials, rubbish, and other debris resulting from the site work operations and maintain the site in a neat and orderly condition at all times;
- Maintain drainage system. Free of debris and loose materials and is in an operation condition at all times;
- Dispose waste material, debris and rubbish at designated dumping areas, and in accordance with National and Provincial ordinances and anti-pollution laws

The project shall be left in condition ready for occupancy to the satisfaction of the Engineer.

7. PROJECT SUPERVISION

7.1 Site Supervisors

Provide Competent, Licensed Civil Engineer, duly accredited by the PRC. A Site Engineer of the contractor will be responsible for the direct supervision of the construction. He/She will lead the construction activities on field.

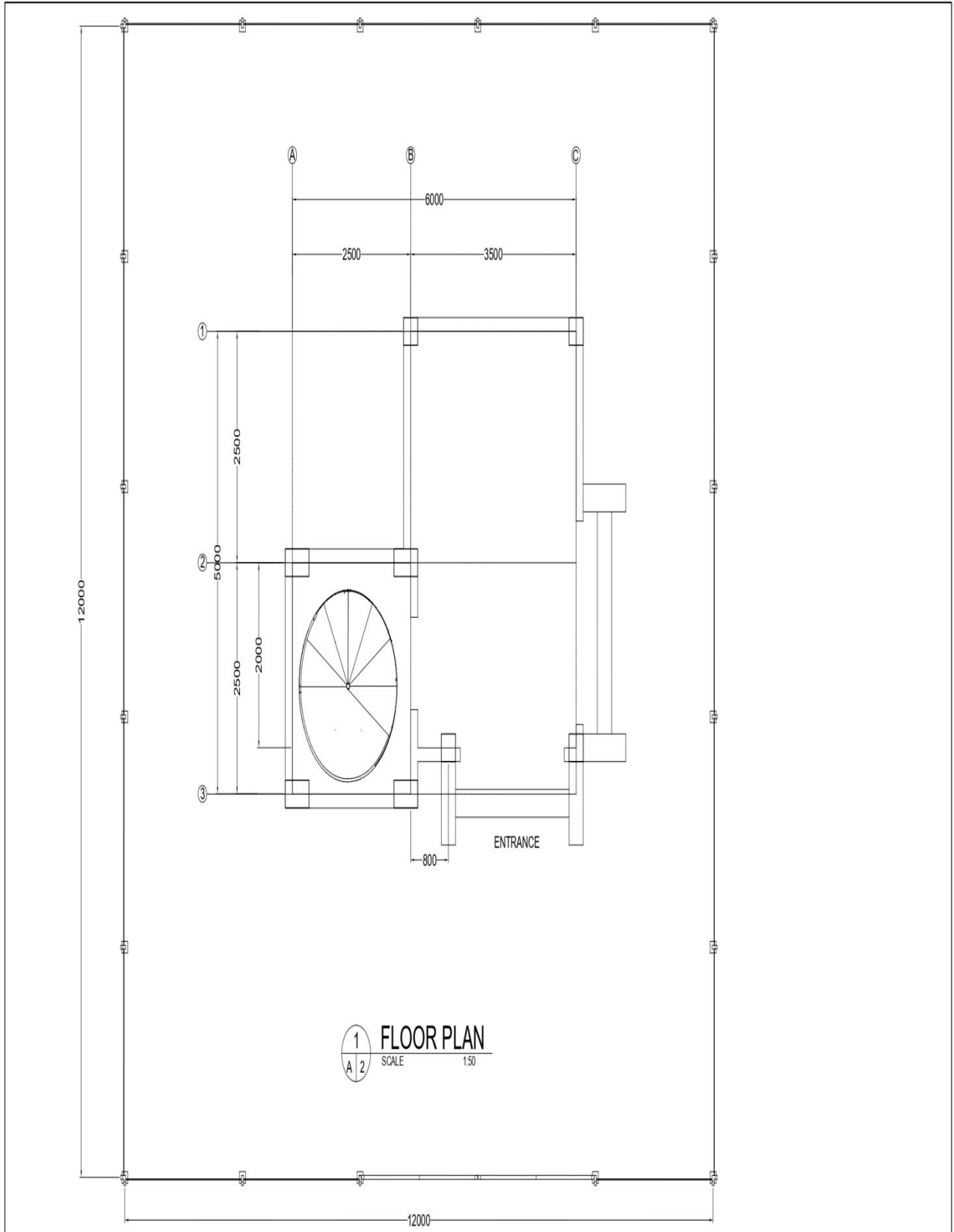
Foreman shall be likewise competent.

Annex B

Section VII. Drawings

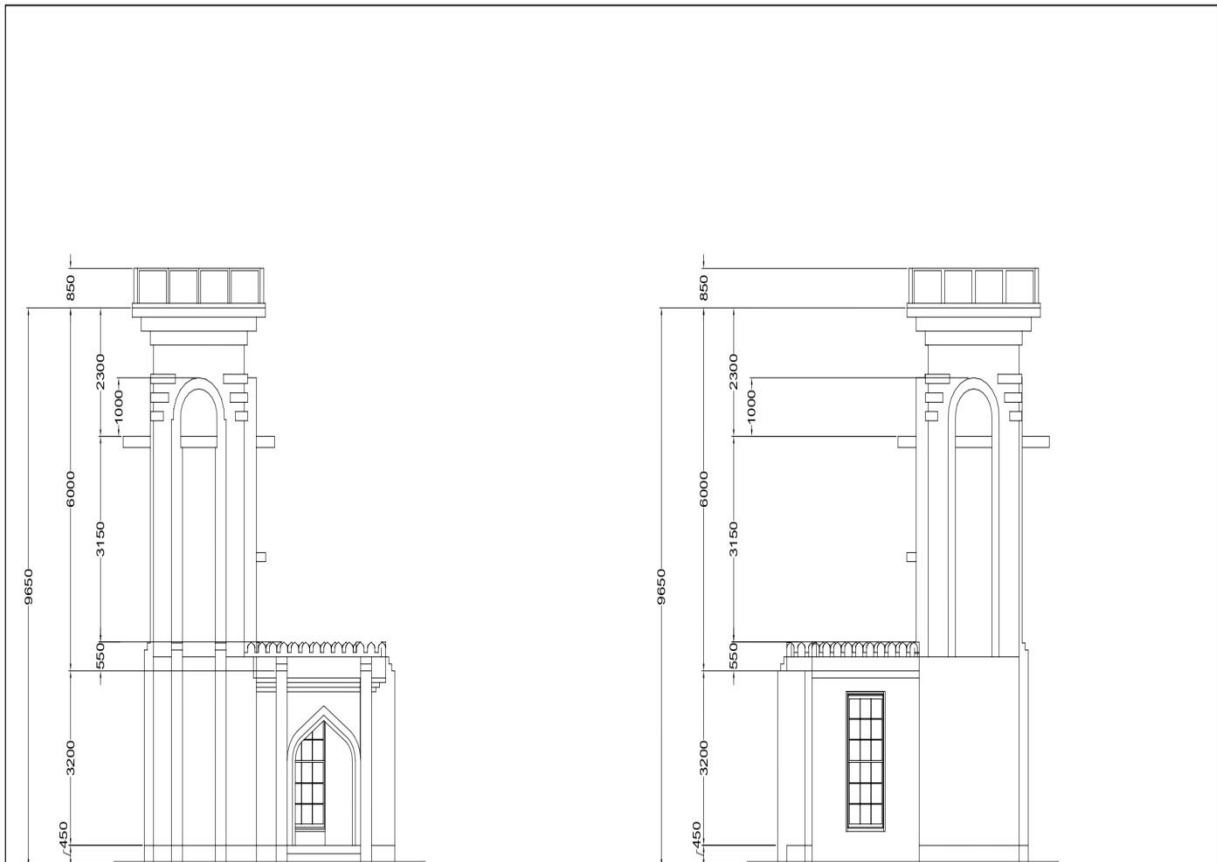


Perspective



1 FLOOR PLAN
A 2 SCALE 1:50

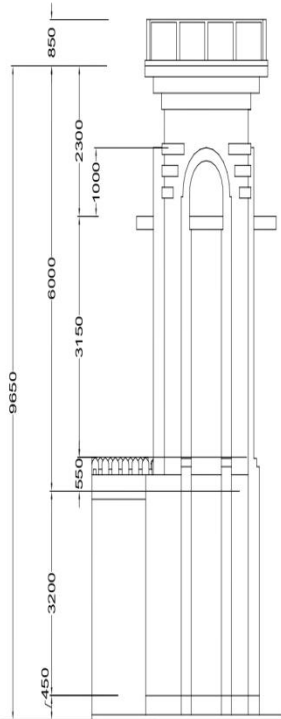
PROJECT NAME & LOCATION	SHEET CONTENTS	PREPARED	REVIEWED	SUBMITTED	RECOMMENDING APPROVAL	APPROVED	SHEET NO.
CONSTRUCTION OF MOON SIGHTING	FLOOR PLAN	**** DATE: 0000	**** DATE: 0000	***** DATE: 000000	***** DATE: 00000000	***** DATE: 0000000000	A-02 03 09



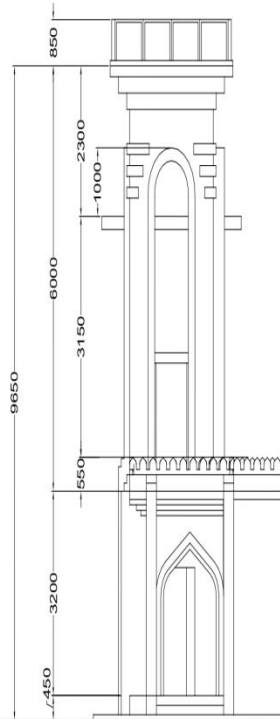
1 FRONT ELEVATION
A 3 SCALE 1:100

2 REAR ELEVATION
A 3 SCALE 1:100

PROJECT NAME & LOCATION	SHEET CONTENTS	PREPARED	REVIEWED	SUBMITTED	RECOMMENDING APPROVAL	APPROVED	SHEET NO.
CONSTRUCTION OF MOON SIGHTING	ELEVATION PLAN	****	*****	*****	*****	*****	A-03 04/09
		0000 DATE	0000 DATE	00000 DATE	0000000 DATE	000000000 DATE	



1 LEFT ELEVATION
A 4 SCALE 1:100



2 RIGHT ELEVATION
A 4 SCALE 1:100

PROJECT NAME & LOCATION	SHEET CONTENTS	PREPARED	REVIEWED	SUBMITTED	RECOMMENDING APPROVAL	APPROVED	SHEET NO.
CONSTRUCTION OF MOON SIGHTING	ELEVATION PLAN	***	****	*****	*****	*****	A-Q4
		0000	00000	000000	0000000	000000000	05/09

GENERAL CONSTRUCTION NOTES

GENERAL NOTES

- IN THE INTERPRETATION OF THE DRAWING, INDICATED DIMENSIONS SHALL GOVERN AND DISTANCES AND SIZES SHALL NOT BE SCALED FOR CONSTRUCTION PURPOSES.
- REFERENCE TO OTHER DRAWINGS, SEE ARCHITECTURAL DRAWINGS FOR DEPRESSIONS IN FLOOR SLABS, OPENINGS IN THE WALLS AND SLABS, INTERIOR PARTITIONS, LOCATION OF DRAINS ETC.
- IN CASE OF DISCREPANCIES AS TO THE LAYOUT, DIMENSIONS, AND ELEVATIONS BETWEEN THE STRUCTURAL PLANS, AND ARCHITECTURAL DRAWINGS, THE CONTRACTOR SHALL NOTIFY BOTH THE STRUCTURAL ENGINEER AND THE ARCHITECT.
- ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH THE ACI 318-05 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE AND ALL STRUCTURAL STEEL WORK ACCORDING WITH AISC SPECIFICATION (9th EDITION) IN SO FAR AS THEY DO NOT CONFLICT WITH THE LOCAL BUILDING CODE REQUIREMENT.
- NO REFERS TO AMERICAN CONCRETE INSTITUTE, ASSC TO AMERICAN INSTITUTE OF STEEL CONSTRUCTION AND ASTM TO AMERICAN SOCIETY FOR TESTING MATERIALS.
- CONSTRUCTION NOTES AND TYPICAL DETAILS APPLY TO ALL DRAWINGS UNLESS OTHERWISE SHOWN OR NOTED. MODIFY TYPICAL DETAILS AS DIRECTED TO MEET SPECIAL CONDITIONS.
- SHOP DRAWINGS WITH ERECTION AND PLACING DIAGRAMS OF ALL STRUCTURAL STEELS, MISCELLANEOUS IRON, PRE-CAST CONCRETE, ETC. SHALL BE SUBMITTED FOR ENGINEERS APPROVAL BEFORE FABRICATION.
- CONTRACTOR SHALL NOTE AND PROVIDE ALL MISCELLANEOUS CURBS, SILLS, STOPS, EQUIPMENTS AND MECHANICAL BASES THAT ARE REQUIRED BY THE ARCHITECTURAL, ELECTRICAL, AND MECHANICAL DRAWINGS.
- ALL RESULTS OF MATERIAL TESTING FOR CONCRETE, REINFORCING BARS & STRUCTURAL STEEL MUST BE NOTED & APPROVED BY THE STRUCTURAL DESIGNER.

NOTES ON CONCRETE MIXES & PLACING

- ALL CONCRETE SHALL DEVELOP A MIN. COMPRESSIVE STRENGTH AT THE END OF TWENTY EIGHT (28) DAYS W/ CORRESPONDING MAXIMUM SIZE AGGREGATE & SLUMPS AS FOLLOWS.

LOCATION	28 DAYS STRENGTH	MAX. SIZE OF MAX. SLUMP AGGREGATE
ALL OTHERS, INCLUDING		
SUSPENDED SLABS	4000 PSI (27.6 MPa)	20mm / 100mm
COLUMNS	4000 PSI (27.6 MPa)	20mm / 100mm
BEAMS, SLABS	4000 PSI (27.6 MPa)	20mm / 100mm
SLAB ON FILL	3000 PSI (20.7 MPa)	20mm / 100mm

- MINIMUM WASTEN CONCRETE COVER FOR REINFORCING STEEL AS FOLLOWS:
 SUSPENDED SLABS ----- 20mm
 SLAB ON GRADE ----- 40mm
 WALLS ABOVE GRADE ----- 25mm
 BEAM STRIPS AND COLUMN TIES ----- 40mm
 WHERE CONCRETE IS EXPOSED TO EARTH BUT FORMED AGAINST FORM ----- 50mm
 WHERE CONCRETE IS DEPOSITED DIRECTLY AGAINST EARTH ----- 75mm

- CONCRETE SHALL BE DEPOSITED IN ITS FINAL POSITION WITHOUT SEGREGATION. RE-HANDLING OR PLACING SHALL BE DONE PROPERLY WITH BUCKETS, BUCKETS OR WHEELBARROWS, NO CHUTES WILL BE ALLOWED EXCEPT TO TRANSFER CONCRETE FROM HOPPERS TO BUCKETS, WHEELBARROWS OR BUCKETS IN WHICH CASE THEY SHALL NOT EXCEED SIX (6) METERS IN AGGREGATE LENGTH.

- NO DEPOSITING OF CONCRETE SHALL BE ALLOWED WITHOUT THE USE OF VIBRATORS UNLESS AUTHORIZED IN WRITING BY THE DESIGNER AND ONLY FOR UNUSUAL CONDITIONS WHERE VIBRATION IS EXTREMELY DIFFICULT TO ACCOMPLISH.

- ANCHOR BOLTS, DOWELS AND OTHER INSERTS, SHALL BE PROPERLY POSITIONED & SECURED IN PLACE PRIOR TO PLACING OF CONCRETE.

- ALL CONCRETE SHALL BE KEPT MOIST FOR A MINIMUM OF SEVEN CONSECUTIVE DAYS IMMEDIATELY AFTER POURING BY THE USE OF NET BURLAP, FOG SPRAYING, CURING COMPOUNDS OR OTHER APPROVED METHODS.

- STRIPPING OF FORMS AND SHORES:
 FOUNDATION ----- 24 HRS.
 SUSPENDED SLAB EXCEPT WHEN ADDITIONAL LOADS ARE IMPOSED ----- 8 DAYS
 WALLS ----- 21 DAYS
 BEAMS ----- 14 DAYS
 COLUMNS ----- 21 DAYS

- THE CONTRACTOR SHALL SUBMIT THE SCHEDULE OF POURING AND THE LOCATION OF THE CONSTRUCTION JOINTS TO THE STRUCTURAL ENGINEER AT LEAST (4) DAYS PRIOR TO THE POURING FOR APPROVAL.

- THE CONTRACTOR SHALL FURNISH AND MAINTAIN ADEQUATE FORMS AND SHORINGS UNTIL THE CONCRETE MEMBERS HAVE ATTAINED THEIR WORKING CONDITION AND STRENGTH.

NOTES ON FOOTINGS

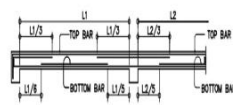
- FOOTINGS ARE DESIGNED FOR AN ALLOWABLE SOIL BEARING PRESSURE OF 86 KPa (2000 psf). CONTRACTOR SHALL REPORT TO THE ENGINEER, IN WRITING, THE ACTUAL SOIL CONDITIONS UNCOVERED AND CONFIRM ACTUAL BEARING CAPACITY OF SOIL BEFORE DEPOSITING CONCRETE.
- FOOTING SHALL REST AT LEAST 150mm BELOW NATURAL GRADE LINE UNLESS OTHERWISE INDICATED IN PLANS. NO FOOTING SHALL REST ON FILL.
- MINIMUM CONCRETE PROTECTION FOR REINFORCEMENTS SHALL BE 75mm CLEAR FOR CONCRETE DEPOSITED THE GROUND AND 50mm FOR CONCRETE DEPOSITED AGAINST A FORMWORK.

NOTES ON REINFORCEMENT

- UNLESS OTHERWISE NOTED IN PLANS, THE YIELD STRENGTH OF REINFORCING BARS SHALL BE:
 A. FOOTINGS, FOOTING BEAMS AND GIRDERS ----- $f_y = 275 \text{ MPa}$ (40,000 psi)
 B. COLUMNS AND SHEAR WALLS ----- $f_y = 275 \text{ MPa}$ (40,000 psi)
 C. BEAMS AND GIRDERS ----- $f_y = 275 \text{ MPa}$ (40,000 psi)
 D. NON-LOAD BEARING WALL PARTITIONS, BEDED SLABS, FLOOR & ROOF SLABS, FRAPERS, CATCH BASIN, SIDE WALK ----- $f_y = 227.5 \text{ MPa}$ (33,000 psi)
- ALL REINFORCING BARS SIZE 10mm OR LARGER SHALL BE DEFORMED IN ACCORDANCE WITH ASTM A 706. BARS SMALLER THAN 10mm MAY BE PLAN.
- SPLICES SHALL BE SECURELY WIRED TOGETHER & SHALL LAP OR EXTEND IN ACCORDANCE W/ TABLE A & TABLE B (TABLE OF LAP SPICE & ANCHORAGE LENGTH) UNLESS OTHERWISE SHOWN ON DRAWINGS. SPLICES SHALL BE STAGGERED WHENEVER POSSIBLE.

NOTES ON CONCRETE SLABS

- ALL SLAB REINFORCEMENTS SHALL BE 20mm CLEAR MINIMUM FROM BOTTOM AND FROM THE TOP OF SLAB.
- UNLESS OTHERWISE SHOWN, REINFORCEMENT IN CONTINUOUS ELEVATED SLAB SHALL BE CUT AS FOLLOWS.

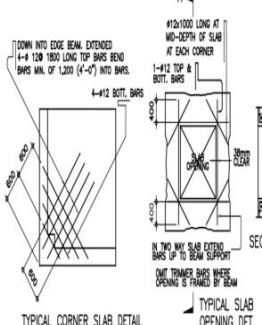


TYPICAL BAR BENDING AND CUTTING DETAILS FOR SLABS

- IF SLABS ARE REINFORCED BOTHWAYS, BARS ALONG THE SHORTER SPAN SHALL BE PLACED BELOW THOSE ALONG THE LONG SPAN AT THE CENTER AND OVER THE LONGER SPAN FOR REINFORCING BARS NEAR THE SUPPORTS. THE SPACING OF THE BARS AT THE COLUMN STRIPS SHALL NOT BE MORE THAN ONE AND A HALF (1 1/2) SLAB THICKNESS.
- TEMPERATURE BARS FOR SLAB SHALL BE GENERALLY PLACED NEAR THE FACE IN TENSION AND SHALL NOT BE LESS THAN $100 \times \sqrt{f_c}$ CROSS SECTIONAL AREA (A_s) OF THE SLAB (SEE SCHEDULE BELOW).

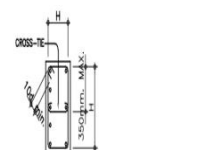
THICKNESS	MINIMUM TEMPERATURE BARS
100 mm	10 mm # 8 @ 200mm EACH WAY
125 mm	10 mm # 8 @ 225mm EACH WAY
150 mm	10 mm # 8 @ 180mm EACH WAY
175 mm	10 mm # 8 @ 150mm EACH WAY
200 mm	10 mm # 8 @ 140mm EACH WAY

- UNLESS OTHERWISE NOTED IN THE PLANS ALL BEDED SLABS SHALL BE REINFORCED WITH 10mm # 8 AT 250mm O.C EACH WAY TO CENTER OF SLAB AND CONSTRUCTION JOINTS FOR SAME SHALL NOT BE LESS THAN 3.65 METER APART.
- PROVIDE EXTRA REINFORCEMENTS FOR CORNER SLAB (TWO ADJACENT DISCONTINUOUS EDGES) AS SHOWN BELOW.
- CONCRETE SLAB REINFORCEMENTS SHALL BE PROPERLY SUPPORTED WITH 10mm # 8 STEEL CHAIR OR APPROVED EQUIVALENT SPACED AT 1.0 METER ON CENTER BOTHWAYS.



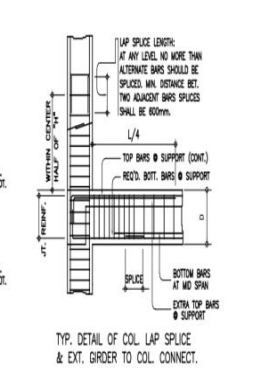
NOTES ON COLUMNS

- PROVIDE EXTRA SETS OF TIES AT 100mm O.C. FOR TIED COLUMN REINFORCEMENT ABOVE AND BELOW BEAM-COLUMN CONNECTIONS FOR A DISTANCE FROM FACE OF CONNECTION EQUAL TO THE GREATER OF THE OVERALL THICKNESS OF COLUMN, 1/4 THE CLEAR HEIGHT OF COLUMN OR 450mm.
- COLUMN TIES SHALL BE PROTECTED EVERYWHERE BY A COVERING OF CONCRETE CAST MONOLITHICALLY WITH THE CORE WITH THE MINIMUM THICKNESS OF 40mm AND NOT LESS THAN 40 TIMES THE MAXIMUM SIZE OF COURSE AGGREGATE IN MILLIMETERS.
- WHERE COLUMNS CHANGE IN SIZE, VERTICAL REINFORCEMENTS SHALL BE OFFSET AT A SLOPE OF NOT MORE THAN 1 IN 8 AND EXTRA 10mm TIES AT 100mm SHALL BE PROVIDED THRU OUT THE OFFSET REGION.
- UNLESS OTHERWISE INDICATED IN THE PLANS, LAP SPLICES FOR VERTICAL COLUMN REINFORCEMENT SHALL BE MADE WITHIN THE CENTER HALF OF COLUMN HEIGHT AND THE SPLICE LENGTH SHALL NOT BE LESS THAN 40 BAR DIAMETERS. WELDING OR APPROVED MECHANICAL DEVICES MAY BE USED PROVIDED THAT NOT MORE THAN ALTERNATE BARS ARE WELDED OR MECHANICALLY SPLICED AT ANY LEVEL AND THE VERTICAL DISTANCES BETWEEN THESE WELDES OR SPLICES OF ADJACENT BARS IS NOT LESS THAN 600mm.



- MINIMUM HOOP SPACE OF "2d" WHEN THERE ARE BEAMS HAVING DEPTH OF AT LEAST ONE-HALF THE COLUMN WIDTH & SPLICES NOT LESS THAN THREE QUARTERS OF THE DEEPEST BEAM THAT FRAME INTO FOUR SIDES OF THE COLUMN. ALL OTHER CONDITIONS USE HOOPS OF "3d" SPACING.
- FOR COL. BAR SPLICES SEE TABLE OF MIN. LAP SPICE LENGTH OF COLUMN REINFORCEMENT (SPACING OF TIES ALONG THIS REGION SHALL NOT BE LESS THAN 100mm).

TYPICAL COLUMN ELEV. SHOWING DOWELS AND TIES SPACING



NOTES ON BEAMS AND GIRDERS

- UNLESS OTHERWISE NOTED IN PLANS, CHAIR ALL BEAMS AND GIRDERS AT LEAST 60mm FOR EVERY 450M OF SPAN, EXCEPT OUTLETERS FOR WHICH THE CHAIR SHALL BE AS NOTED IN PLANS OR AS ORDERED BY THE ENGINEER BUT IN NO CASE LESS THAN 20mm FOR EVERY 3.0M OF FREE SPAN.
- TYPICAL BARS BENDING AND CUTTING DETAILS FOR BEAMS SHALL BE AS SHOWN IN FIG. B-1.

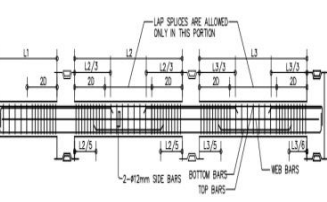


FIG. B-1

TABLE 'A' TENSION BARS EMBEDMENT LENGTHS AND LAPPED SPLICES IN MILLIMETERS				TABLE 'B' COMPRESSION BARS EMBEDMENT LENGTHS AND LAPPED SPLICES IN MILLIMETERS			
BAR SIZE (DEFORMED)	($f_y \leq 275 \text{ MPa}$)	($f_y = 275 \text{ MPa}$)	($f_y = 355 \text{ MPa}$)	BAR SIZE (DEFORMED)	($f_y \leq 275 \text{ MPa}$)	($f_y = 275 \text{ MPa}$)	($f_y = 355 \text{ MPa}$)
EMBEDMENT	LAPED	SPLICED	LAPED	EMBEDMENT	LAPED	SPLICED	LAPED
10mm	300	300	300	10mm	225	300	300
12mm	300	300	300	12mm	275	300	300
16mm	300	400	300	16mm	300	400	325
20mm	400	500	300	20mm	400	500	300
25mm	400	500	300	25mm	500	500	325
32mm	500	600	400	32mm	625	625	475
40mm	600	700	500	40mm	700	700	500

NOTE: TOP PLAN BARS, MULTIPLY VALUE BY 2
 NOTE: TOP PLAN BARS, MULTIPLY VALUE BY 1
 VALUES MORE CAN ALSO BE USED FOR COLUMNS.

- IF THE BEAM REINFORCING BARS END IN A WALL THE CLEAR DISTANCE FROM THE BAR TO THE FURTHER FACE OF THE WALL SHALL NOT BE LESS THAN 20mm. EMBEDMENT LENGTH SHALL BE AS SHOWN IN A TABLE 'A' FOR TENSION BARS AND TABLE 'B' FOR COMPRESSION BARS UNLESS SPECIFIED IN PLAN. TOP BAR SHALL NOT BE SPLICED WITHIN THE COLUMN OR WITHIN A DISTANCE THREE TIMES THE MEMBER DEPTH FROM THE FACE OF THE COLUMN. AT LEAST TWO STRIPS SHALL BE PROVIDED AT ALL SPLICES.
- IF THERE ARE TWO OR MORE LAYERS OF REINFORCING BARS, USE 25mm # 8 BEHAVIOURS SPACED AT 1.0M ON CENTER. IN NO CASE SHALL THERE BE LESS THAN TWO (2) SEPARATORS BETWEEN TWO LAYERS OF BARS.
- MINIMUM CONCRETE PROTECTION FOR REINFORCING BARS OR STEEL SHAPES SHALL BE AS SHOWN IN FIG. B-2 UNLESS SPECIFIED ELSEWHERE.

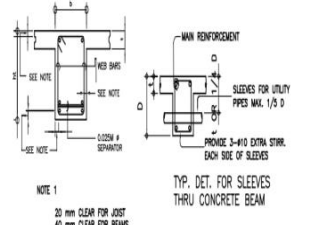


FIG. B-2

FIG. B-3

- WHEN A BEAM CROSSES A GIRDER, REST BEAM ON TOP OF GIRDER BARS. BEAM REINFORCING BAR SHALL BE SYMMETRICAL ABOUT CENTER LINE WHENEVER POSSIBLE.
- GENERALLY NO SPLICES SHALL BE PERMITTED AT POINTS WHERE CRITICAL BENDING STRESSES OCCUR, SPLICES WHERE SO PERMITTED SHALL BE INDICATED IN THE TABLE 'A' AND 'B'. WELDED SPLICES SHALL DEVELOP IN TENSION AT LEAST 125 % OF THE SPECIFIED YIELD STRENGTH OF THE BAR, NOT MORE THAN SIX OF THE BARS AT ANY ONE SECTION IS ALLOWED TO BE SPLICED THEREIN.

PROJECT NAME ALLOCATION	SHEET CONTENTS	PREPARED	REVIEWED	SUBMITTED	RECOMMENDING APPROVAL	APPROVED	SHEET NO.
CONSTRUCTION OF MOON SIGHTING	CONSTRUCTION NOTES	****	*****	*****	*****	*****	S-01 06/09

GENERAL CONSTRUCTION NOTES

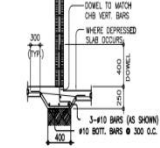
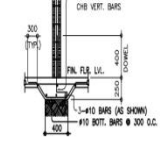
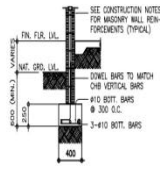
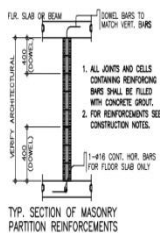
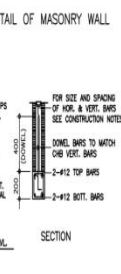
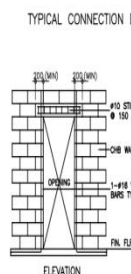
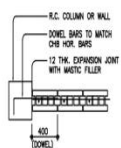
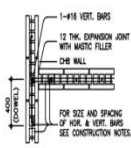
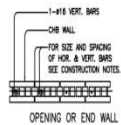
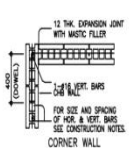
NOTES ON CONCRETE HOLLOW BLOCK WALLS

- UNLESS OTHERWISE SHOWN IN PLANS ALL CONCRETE HOLLOW BLOCKS AND CERAMIC BLOCKS SHALL BE REINFORCED AS SHOWN IN THE SCHEDULE OF CONCRETE HOLLOW BLOCKS AND CERAMIC BLOCK REINFORCEMENT.
- PROVIDE 150mm x 150mm STIFFENER COLUMN REINFORCED WITH 4-12mm VERT. BARS @ 150mm ON CENTER WHERE CONCRETE HOLLOW BLOCK TERMINATES AND AT EVERY 3.0M LENGTH OF CONCRETE HOLLOW BLOCK WALLS UNLESS NOTED IN STRUCTURAL PLANS.

BLOCK THICKNESS	HORIZONTAL REINFORCEMENT	VERTICAL REINFORCEMENT	NOTES
75 mm	10mm @ 80mm O.C.	10mm @ 80mm O.C.	A. MINIMUM LAPS AT SPICE = 1.2M B. PROVIDE SHORT WELDED REINFORCEMENT AT CORNER BARS LAP
102 mm	10mm @ 80mm O.C.	10mm @ 80mm O.C.	C. WELDED CHB OR CHB. WALL BONES FOR COL. R.C. BEAM AND WALL BONES WITH THE SAME SIZE OF VERT. OR HOR. REINFORCEMENTS SHALL BE PROVIDED
150 mm	10mm @ 80mm O.C.	10mm @ 80mm O.C.	
200 mm	10mm @ 80mm O.C.	10mm @ 80mm O.C.	

REINFORCING CONCRETE LINTEL BEAM IN CONCRETE BLOCK WALLS

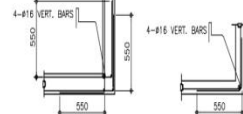
DEPTH (mm)	TOTAL LENGTH (mm)	MIN. HEIGHT OF REINFORCEMENT (mm)	REINFORCEMENT
120	1200	200	1-403 1-403 4mm @ 200mm
150	1500	200	1-403 1-403 4mm @ 200mm
180	1800	200	1-403 1-403 4mm @ 200mm
210	2100	200	1-403 1-403 4mm @ 200mm
240	2400	200	1-403 1-403 4mm @ 200mm
270	2700	200	1-403 1-403 4mm @ 200mm
300	3000	200	1-403 1-403 4mm @ 200mm
330	3300	200	1-403 1-403 4mm @ 200mm
360	3600	200	1-403 1-403 4mm @ 200mm



NOTES ON CONCRETE WALLS

- ALL WALLS SHALL BE REINFORCED ACCORDING TO THE FOLLOWING SCHEDULE OF WALL REINFORCEMENT UNLESS OTHERWISE INDICATED IN THE PLANS.

WALL THICKNESS	REINFORCEMENT		REMARKS	VERTICAL SECTION
	HORIZONTAL	VERTICAL		
100mm	#10mm @ 200mm O.C.	#10mm @ 200mm O.C.	HORIZONTAL BARS AT CORNER VERTICAL BARS SPACED AT 150mm	VERT. BARS
120mm	#10mm @ 200mm O.C.	#10mm @ 200mm O.C.	HORIZONTAL BARS AT CORNER VERTICAL BARS SPACED AT 150mm	VERT. BARS
150mm	#10mm @ 200mm O.C.	#10mm @ 200mm O.C.	HORIZONTAL BARS AT CORNER VERTICAL BARS SPACED AT 150mm	VERT. BARS
- CARRY VERTICAL BARS AT LEAST 60mm ABOVE FLOOR LEVEL TO PROVIDE FOR SPACES WHEN NECESSARY STOP AT 20mm BELOW TOP SLAB OR SOLE BARS WHERE THE WALL LIES VERTICAL AND HORIZONTAL BARS SHALL BE SPACED BY LAPPING AT A DISTANCE EQUAL TO 30 DIAMETERS AND WELDED WITH 18 ELI WIRE PROVIDED THAT SPACES IN ADJACENT BARS ARE STaggered AT LEAST 1.5M O.C.
- UNLESS OTHERWISE NOTED IN THE PLANS, ALL OPENINGS IN WALLS 250mm OR THICKER SHALL BE REINFORCED AROUND WITH 2-20mm BARS FOR 225mm, 200mm, 175mm, 150mm, USE 2-16mm FOR 125mm AND 100mm WALLS USE 2-12mm BARS. ALL WALLS SPANNING SHALL HAVE VERTICAL REINFORCEMENT BENT TO A U-FORM LIKE STRIPPERS AND SPACED ACCORDING TO THE SCHEDULE UNLESS OTHERWISE NOTED (SEE FIG.1)



TYPICAL CONNECTION DETAIL OF R.C. WALL AT CORNERS

NOTES ON WELDS

- USE E70XX ELECTRODES FOR ALL MEMBERS WELDED.
- WELDS SHALL DEVELOP THE FULL STRENGTH OF MEMBERS JOINED UNLESS OTHERWISE SHOWN OR DETAILED IN THE DRAWINGS.

NOTES ON STRUCTURAL STEEL

- STRUCTURAL STEEL TO BE USED FOR FABRICATION AND ERECTION OF THIS STRUCTURE SHALL COMPLY WITH ALL THE PERTINENT PROVISIONS OF AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDING LATEST EDITION.
- ALL STRUCTURAL STEEL SHAPES SHALL CONFORM TO AISC STRUCTURAL STEEL UNLESS OTHERWISE INDICATED.
- ALL WELDED CONNECTIONS SHALL DEVELOP THE FULL STRENGTH OF THE MEMBERS CONNECTED.
- UNLESS OTHERWISE SPECIFIED ALL WELDING ROSS SHALL CONFORM A516 ELECTRODES.
- ALL BOLTS USED UNLESS OTHERWISE SPECIFIED SHALL BE ASTM A 307 BOLTS.

NOTES ON EMBEDDED PIPES

- ALL EMBEDDED PIPES FOR UTILITIES, ETC. THAT PASS THRU BEAMS SHALL NOT EXCEED 100mm IN DIAMETER OR 1/3 BEAM DEPTH WHICHEVER IS LESS, UNLESS OTHERWISE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER.
- NO PIPES SHALL BE ALLOWED TO PASS THRU BEAMS VERTICALLY.
- NO PIPES SHALL BE EMBEDDED IN COLUMNS.

DESIGN CRITERIA

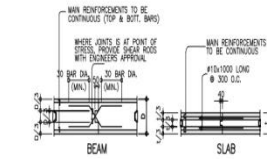
- LOADINGS
 - DEAD LOAD
 - CONCRETE: $-25.00kN/m^2$
 - STEEL: $-78.00kN/m^2$
 - 100mm THK. CHB WALL: $-2.73 kPa$
 - 100mm THK. CHB WALL: $-2.11 kPa$
 - USE LOAD: $-1.00 kPa$
 - WIND LOAD (NEEP 2010)
 - BASIC WIND VELOCITY, $V = 250$ MPH
 - $P = q \cdot C_{pe} - (q_{suction})$ (DESIGN WIND PRESSURE)
 - WHERE: $q =$ WIND VELOCITY PRESSURE (kPa)
 - $C_{pe} =$ EXTERNAL PRESSURE COEFFICIENT
 - $C_{si} =$ INTERNAL PRESSURE COEFFICIENT
 - SEISMIC LOAD (NSCP 2010)
 - $V = \frac{C_d}{R} \cdot W$ (DESIGN BASE SHEAR)
 - $V_{min} = 2.50 \cdot C_d \cdot W$ $V_{min} = 0.11 \cdot W$
 - $V_{max} = 0.87 \cdot \frac{2W}{R}$ (ZONE 4)
 - WHERE: $W =$ TOTAL DEAD LOAD
 - $R =$ NATURAL PERIOD $\cdot C_d$ ()
 - WHERE: $C_d =$ NUMERICAL COEFFICIENT
 - $\delta =$ BUILDING HEIGHT
 - $I =$ IMPORTANCE FACTOR = 1.50
 - $R =$ NUMERICAL FACTOR = 8.00
 - SEISMIC COEFFICIENT $C_s = 0.44k$
 - NEAR SOURCE FACTOR (10km) $N_s = 1.2$
 - $N_s = 1.2$
 - 2 = SEISMIC ZONE = 6.40 (ZONE 4)
 - $S =$ SOIL TYPE = 0

DESIGN STRESSES

- CONCRETE
 - COMPRESSIVE STRENGTH @ 28 DAYS: $f'_c = 20.7$ MPa (3000 psi)
 - FOR BARS 10mm # AND GREATER: $f_y = 276$ MPa (40,000 psi)
 - FOR BARS LESS THAN 10mm #: $f_y = 230$ MPa (33,000 psi)
- REINFORCING BARS
 - FOR TENSILE BARS, ASTM-A63 FOR TENSILE BARS, ASTM-A63 FOR TENSILE BARS, ASTM-A63 FOR TENSILE BARS
 - COLD FORMED LIGHT GAUGE SHEETS: $f_y = 248$ MPa (35,000 psi)
- WROUGHT IRON (CHB)
 - MIN-40# BENDING CHB WALLS: $f_y = 344$ MPa (50k psi)
- WELDS-USED E-80XX ELECTRODE
- STRUCTURAL BOLTS, A500-507
 - $f_u = 84.80$ MPa (14,000 psi) $f_y = 69$ MPa (10,000 psi)

NOTES ON CONSTRUCTION JOINTS IN CONCRETE

- WHERE A CONSTRUCTION JOINT IS TO BE MADE, THE SURFACE OF CONCRETE SHALL BE CLEANED AND ALL LANTINE AND STANDING WATER REMOVED. SHEAR KEY SHALL BE PROVIDED AT THE JOINT.



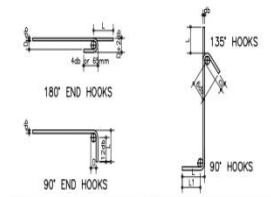
TYPICAL SLAB & BEAM CONSTRUCTION JOINT DET.



TYP. EXTERIOR WINDOW & DOOR OPENING

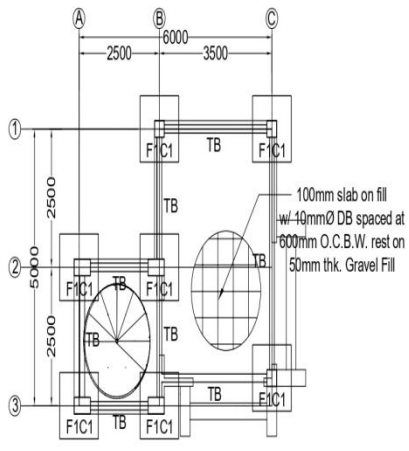
NOTES OF STRIPPUS

- ALL REINFORCEMENT SHALL BE BENT GOLD UNLESS OTHERWISE PERMITTED BY THE STRUCTURAL ENGINEER.
- REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FILLED BENT, EXCEPT AS SHOWN IN THE DESIGN DRAWINGS OR PERMITTED BY THE STRUCTURAL ENGINEER.
- TIES & CLOSE STRIPPUS MUST BE BENT AT 135°.

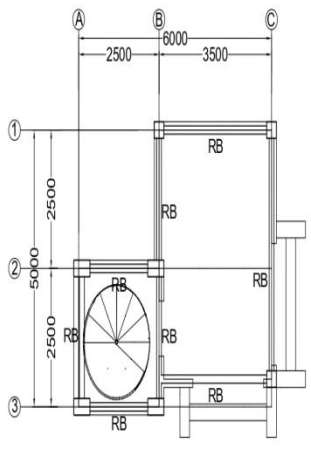


MAIN BAR END HOOKS (ALL GRICES)				STRIPPUS AND TIE HOOKS (ALL GRICES)			
BAR SIZE (mm)	DIAMETER (mm)	180° HOOK	90° HOOK	BAR SIZE (mm)	DIAMETER (mm)	180° HOOK	90° HOOK
10mm	12mm	150	150	10mm	12mm	150	150
10mm	12mm	150	150	10mm	12mm	150	150
10mm	12mm	150	150	10mm	12mm	150	150
10mm	12mm	150	150	10mm	12mm	150	150
10mm	12mm	150	150	10mm	12mm	150	150
10mm	12mm	150	150	10mm	12mm	150	150
10mm	12mm	150	150	10mm	12mm	150	150
10mm	12mm	150	150	10mm	12mm	150	150
10mm	12mm	150	150	10mm	12mm	150	150
10mm	12mm	150	150	10mm	12mm	150	150

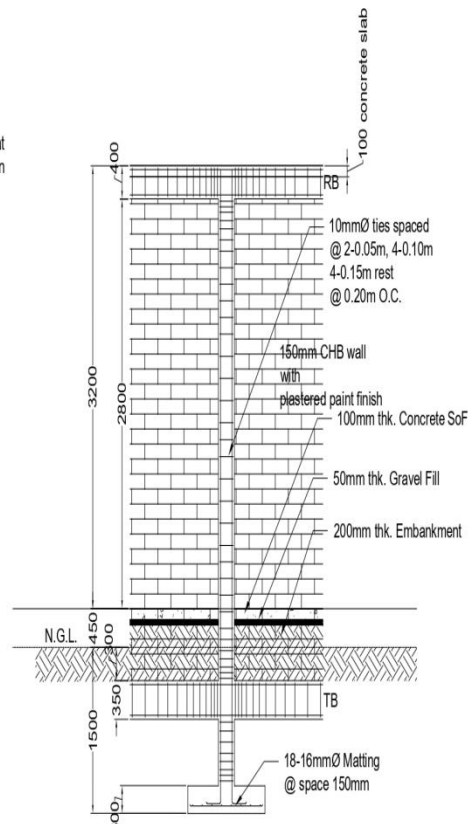
PROJECT NAME & LOCATION	SHEET CONTENTS	PREPARED	REVIEWED	SUBMITTED	RECOMMENDING APPROVAL	APPROVED	SHEET NO.
CONSTRUCTION OF MOON SIGHTING	CONSTRUCTION NOTES	****	*****	*****	*****	*****	S-02 07/09
DATE: 0000	DATE: 000000	DATE: 000000	DATE: 000000	DATE: 00000000	DATE: 0000000000	DATE: 0000000000	



1 FOUNDATION PLAN
SCALE 1:100



2 ROOF BEAM FRAMING PLAN
SCALE 1:100



3 F1C1 DETAILS PLAN
SCALE 1:50

BEAM SCHEDULE		
	MID SPAN	END SPAN
ROOF BEAM (RB)		
	300 x 400 7-Ø 16mm 10mmØ STIRRUPS SPACE @ 3-50mm; 5-100mm; 12-150mm; AND REST @ 200mm O.C.	300 x 400 7-Ø 16mm 10mmØ STIRRUPS SPACE @ 3-50mm; 5-100mm; 12-150mm; AND REST @ 200mm O.C.
LINTEL BEAM		
	200 x 250 4-Ø 16mm 10mmØ STIRRUPS SPACE @ 3-50mm; 5-100mm; 12-150mm; AND REST @ 200mm O.C.	200 x 250 4-Ø 16mm 10mmØ STIRRUPS SPACE @ 3-50mm; 5-100mm; 12-150mm; AND REST @ 200mm O.C.
TB		
	250 x 350 6-Ø 16mm 10mmØ STIRRUPS SPACE @ 3-50mm; 5-100mm; 12-150mm; AND REST @ 200mm O.C.	250 x 350 6-Ø 16mm 10mmØ STIRRUPS SPACE @ 3-50mm; 5-100mm; 12-150mm; AND REST @ 200mm O.C.

PROJECT NAME & LOCATION	SHEET CONTENTS	PREPARED	REVISED	SUBMITTED	RECOMMENDING APPROVAL	APPROVED	SHEET NO.
CONSTRUCTION OF MOON SIGHTING	FOUNDATION PLAN ROOF BEAM FRAMING PLAN FOOTING DETAILS COLUMN DETAILS BEAM SCHEDULE	****	*****	*****	*****	*****	S-03 08/09
		01%	01%	01%	01%	01%	

LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
◇	DROP LIGHT FIXTURE	—	RACEWAY CONDUIT CONCEALED ON CEILING (SWITCH)
○	PIN LIGHT OUTLET (CONCEALED LIGHT)	■	PANEL BOARD
—	40W PINLIGHT	⌋	CIRCUIT BREAKER, RATING AS INDICATED
⊕	CEILING FAN OUTLET	⊕	TAMPERED PROOF DUPLEX CONVENIENCE OUTLET, GROUNDING TYPE 18 AMPS, 250V W/ PLATE COVER
S123	THREE GANG DEVICE SWITCH	⌋	CIRCUIT HOMERUN
S12	TWO GANG DEVICE SWITCH	M	SERVICE METER
S1	ONE GANG DEVICE SWITCH	⊕	SERVICE ENTRANCE
Sf	FAN CONTROL SWITCH	B	FIRE ALARM BELL
—	RACEWAY CONDUIT CONCEALED ON CEILING (POWERLINE)	⊕	FIRE ALARM STATION OUTLET
⊕	ACU OUTLET	⊕	FIRE ALARM CONTROL PANEL

1 SWITCH & LIGHTING LAYOUT

SCALE 1:100

2 POWER LAYOUT

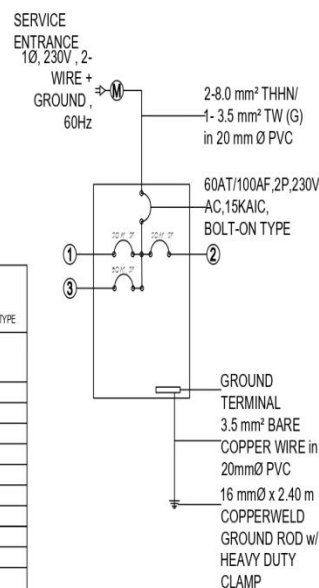
SCALE 1:100

ELECT. GENERAL NOTES

- ALL ELECTRICAL WORKS SHALL COMPLY IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS. THE APPLICABLE PROVISIONS OF THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE (PEC), THE RULES AND REGULATION OF THE LOCAL ENFORCING AUTHORITY AND THE REQUIREMENTS OF THE LOCAL POWER COMPANY. THE ELECTRICAL WORKS SHALL BE UNDER IMMEDIATE SUPERVISION OF A DULY REGISTERED ELECTRICAL ENGINEER.
- THE ELECTRICAL SERVICE POWER IS 1-PHASE, 2-WIRE, 230V AC, 60 Hz.
- WIRING METHOD SHALL BE AS FOLLOWS:
 - FEEDERS AND RISERS - INTERMEDIATE METALLIC CONDUIT
 - LIGHTING, POWER RECEPTACLE - POLYVINYL CHLORIDE CONDUIT
 - BRANCH BKT., & AUXILIARY - SCH. 40
- ALL WIRES SHALL BE COPPER AND THERMOPLASTIC ISOLATED TYPE "THW" UNLESS OTHERWISE INDICATED IN THE PLAN. THE MINIMUM SIZE OF WIRE FOR POWER AND LIGHTINGS CIRCUIT HOMERUN SHALL BE 3.5mm AND INSULATED FOR 600 VOLTS. THE SMALLEST RACEWAY SHALL BE 15mm TRADE/NOMINAL SIZE.
- ALL OUTLET BOXES SHALL BE GALVANIZED GAUGE NO. 16 DEEP TYPE WITH FACTORY KNOCKOUTS.
- ALL MATERIALS TO BE USED SHALL BRAND NEW AND APPROVED TYPE FOR THE PARTICULAR LOCATION AND PURPOSE OF USAGE.
- GROUNDING SYSTEM SHALL BE PROVIDED TO ALL LIGHTING AND POWER CIRCUIT AS PER PHILIPPINE ELECTRICAL CODE REQUIREMENT.
- MOUNTING HEIGHT OF WIRING DEVICES SHALL BE AS FOLLOWS:
 - LIGHT SWITCH - 1.20 M. ABOVE FINISH FLOOR
 - CONVENIENCE OUTLET - 0.30 M. ABOVE FINISH FLOOR
 - PANEL BOARD - 1.50 M. ABOVE FINISH FLOOR

SCHEDULE OF LOADS & COMPUTATION

CIRCUIT NO.	DESCRIPTION	VA LOAD	AMPS	CIRCUIT BREAKER			WIRE AND CONDUIT SIZE	
				INLT	TRIP	AF		
1	LIGHT OUTLET - 7 x 30 W	210	0.95	220	2	20	50	2-3.5mm ² THHN IN 20mm Ø PVC
2	CONV. OUTLET - 5 x 180 W	900	4.10	220	2	20	50	2-3.5mm ² THHN IN 20mm Ø PVC
3	SPARE	1900	8.63	220	2	30	50	
TOTAL		3,010 VA	13.68 A					
		(13.68 - 12) x 80% = 1.34 + 100% (40) = 41.24 Amperes		FEEDER: 2-8.0mm ² THHN + 1 - 5.5 mm ² TW (G) IN 25mm Ø RSC PROTECTION: MAIN - 60AT/100AF, 2P, 230V, 15KAIC, BOLT-ON BRANCH: 3x 20AT, 2P, BOLT-ON IN NEMA 1 ENCLOSURE				



RISER DIAGRAM

PROJECT NAME & LOCATION	SHEET CONTENTS	PREPARED	REVIEWED	SUBMITTED	RECOMMENDING APPROVAL	APPROVED	SHEET NO.
CONSTRUCTION OF MOON SIGHTING	SWITCH & LIGHTING LAYOUT POWER LAYOUT	****	****	*****	*****	*****	E-01 09/09
		000000	000000	000000	00000000	0000000000	

Annex C

Section VIII. Bill of Quantities



Republic of the Philippines
Bangsamoro Autonomous Region in Muslim Mindanao

OFFICE OF THE CHIEF MINISTER

SUPPORT TO LOCAL MORAL GOVERNANCE

Bangsamoro Government Center, Governor Gutierrez Avenue, Rosary Heights VII, Cotabato City 9600



IB NO. :
CONTRACT NAME : CONSTRUCTION OF TOWER OBSERVATORY SPACE FOR TELESCOPE OF THE BANGSAMORO DARU'L IFTA
LOCATION :
ABC :

BILL OF QUANTITIES

Part No. I

Description: **OTHER GENERAL REQUIREMENTS**

ITEM NO.	DESCRIPTION	UNITS	QUANTITY	UNIT COST (Pesos)	AMOUNT (Pesos)
(1)	(2)	(3)	(4)	(5)	(6)
A.1.1(8)	Provision of Filed Office for the Engineer (Rental Basis)	mo	3	In Words: Pesos: In Figures: Php	In Words: Pesos: In Figures: Php
B.5	Project Billboard/ Signboard	mo	2	In Words: Pesos: In Figures: Php	In Words: Pesos: In Figures: Php
B.7(1)	Occupational Safety & Health Program	each	3	In Words: Pesos: In Figures: Php	In Words: Pesos: In Figures: Php
B.9	Mobilization/Demobilization	l.s	1	In Words: Pesos: In Figures: Php	In Words: Pesos: In Figures: Php

Part No. II

803(1)a	Structure Excavation (Common Soil)	cu.m	19.5	In Words: Pesos: In Figures: Php	In Words: Pesos: In Figures: Php
804(1)a	Embankment from Structure Excavation (Common Soil)	cu.m	15.6	In Words: Pesos: In Figures: Php	In Words: Pesos: In Figures: Php
804(1)b	Embankment (from Borrow)	cu.m	10	In Words: Pesos: In Figures: Php	In Words: Pesos: In Figures: Php
804(4)	Gravel Fill	cu.m	2.9	In Words: Pesos: In Figures: Php	In Words: Pesos: In Figures: Php

Prepared by:

Submitted by:

Name of the Representative of the Bidder

Name of the Representative of the Bidder

Position

Position

Name of the Bidder

Name of the Bidder

Date:

Date:



Republic of the Philippines
Bangsamoro Autonomous Region in Muslim Mindanao
OFFICE OF THE CHIEF MINISTER
SUPPORT TO LOCAL MORAL GOVERNANCE



Bangsamoro Government Center, Governor Guterres Avenue, Rosary Heights VII, Cotabato City 9600

IB NO. :
CONTRACT NAME : CONSTRUCTION OF TOWER OBSERVATORY SPACE FOR TELESCOPE OF THE BANGSAMORO DARU'L IFTA
LOCATION :
ABC :

BILL OF QUANTITIES

Part No. III		Description: OTHER GENERAL REQUIREMENTS			
ITEM NO.	DESCRIPTION	UNITS	QUANTITY	UNIT COST	AMOUNT (Pesos)
(1)	(2)	(3)	(4)	(5)	(6)
900(1)c1	Structural Concrete (Class A, 28 days)	cu.m	21.36	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
902(1)a	Reinforcing Steel (Grade 40)	kg	2676.96	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
903(2)	Formworks & Falseworks (Column& Roof Beam)	m ²	91.85	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
Part No. IV					
1001(8)	Sewer Line Works	l.s	1	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
1003(1)	4.5mmTHK Fiber Cement Board on Metal Ceiling Frame	m ²	26.25	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
1008(1)a	Aluminum Glass Windows (Sliding Type with Steel Grill)	m ²	3.6	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
1018(1)	Glazed Tiles and Trim	m ²	20	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
1027(1)	Plain Cement Plaster Finish	m ²	266.07	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php

Prepared by:

Submitted by:

Name of the Representative of the Bidder

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Position

Name of the Bidder

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IB NO. :
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LOCATION :
ABC :

BILL OF QUANTITIES

Part No. III

Description: **OTHER GENERAL REQUIREMENTS**

ITEM NO.	DESCRIPTION	UNITS	QUANTITY	UNIT COST (Pesos)	AMOUNT (Pesos)
(1)	(2)	(3)	(4)	(5)	(6)
1032(1)a	Painting Works (Masonry Painting)	m ²	266.07	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
1032(1)c	Painting Works (Metal Painting)	m ²	12.44	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
1046(2)a1	100mmTHK CHB Non Load Bearing (Including Reinforcing Steel)	m ²	129.79	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
1047(1)	Structural Steel (Spiral Steel Stairs, Hogwire fence and Steel gate)	l.s	1		

Part No. V

1100(10)	Conduits, Boxes & Fittings (Conduit Works/Conduit Rough-in)	l.s	1	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
1101(33)	Wires and Wiring Devices	l.s	1	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
1102(1)	Panel board with Main & Branch Breaker	l.s	1	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php
1103(1)	Lightning Fixtures and Lamps	l.s	1	In Words: Pesos:	In Words: Pesos:
				In Figures: Php	In Figures: Php

Prepared by:

Name of the Representative of the Bidder

Position

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Date:

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Name of the Representative of the Bidder

Position

Name of the Bidder

Date: