



TERMS OF REFERENCE AND TECHNICAL SPECIFICATIONS

PROJECT NAME: Construction of Automated Guideway Transit (AGT) as Laboratory Facility of the Proposed Railway Engineering Program of College of Engineering and Architecture (CEA) at BPSU Main Campus

LOCATION: Bataan Peninsula State University, Main Campus

SECTION 1: THE PROJECT

I. PROJECT DESCRIPTION:

PROJECT NAME:	Construction of Automated Guideway Transit (AGT) as Laboratory Facility of the Proposed Railway Engineering Program of College of Engineering and Architecture (CEA) at BPSU Main Campus
LOCATION:	Bataan Peninsula State University, Main Campus
APPROVED BUDGET FOR CONTRACT (ABC):	Php 12,148,151.20
PROJECT DURATION:	180 CALENDAR DAYS (MARCH – AUGUST 2022)

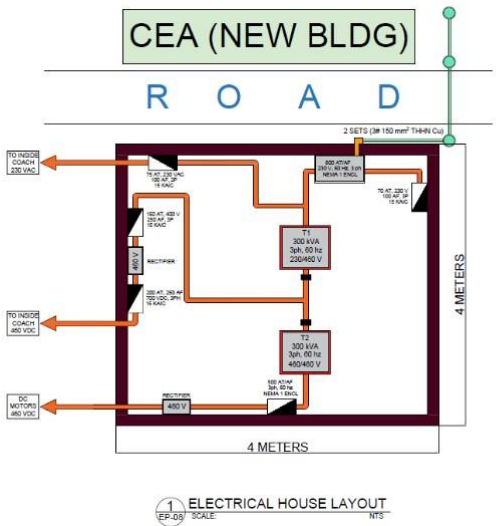
PROPOSED BUILDING:



Note: Metal Covering is not included in the Program of Work.

SCOPE OF WORK: (see attached plans for reference)

- a. Construction of Power / Electrical room

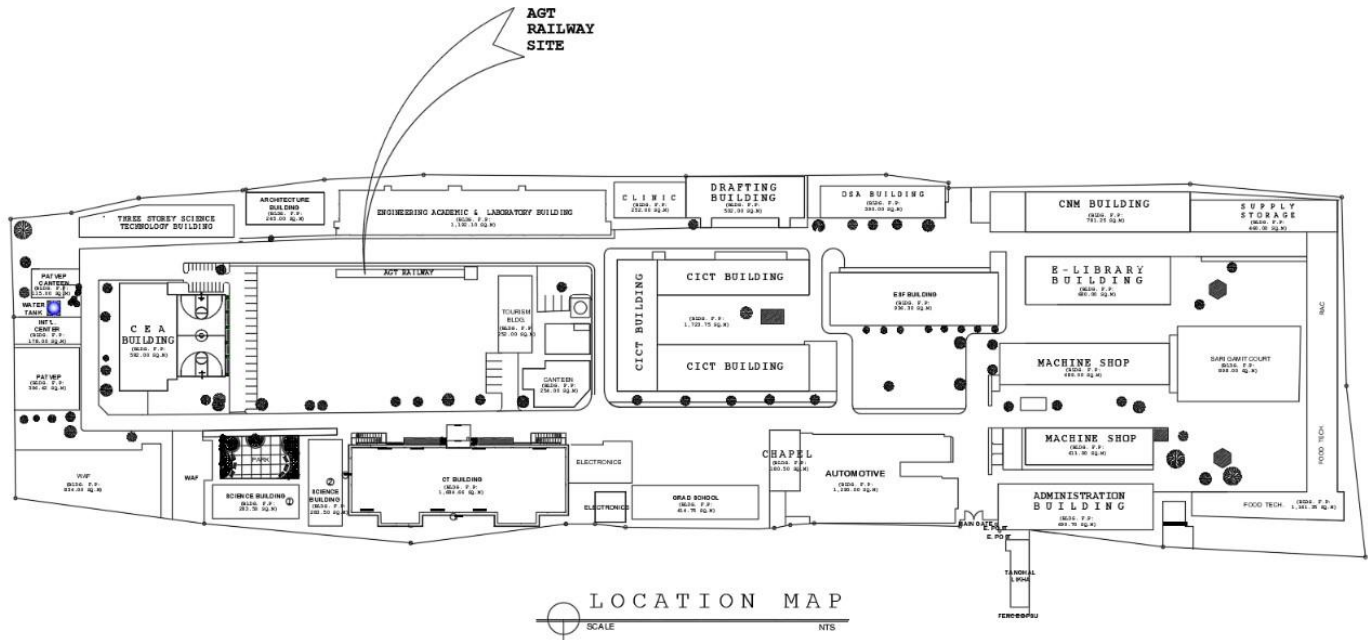




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- b. Electrical Works
- c. Construction of Elevated Track
- d. Construction of Walkway
- e. Site Development
- f. Repair of existing guideway and replacement of rubber and bushing

LOCATION:



II. OBJECTIVES:

- 1. To install AGT in front of College of Engineering and Architecture Building to be used as visual instructional medium for the laboratory of current Engineering programs and proposed Railway Engineering.
- 2. To have Ready to use Infrastructure Building including the Electrical Power Supply.

- END OF SECTION -

SECTION 2: TECHNICAL SPECIFICATIONS

DIVISION 01: GENERAL REQUIREMENTS

- 1. The work covered under this Contract consists of the furnishing all materials, labor, equipment, transportation, incidentals, facilities, and superintendence necessary to complete the project.
- 2. The Contractor is expected and **required** to attend the important phases of the bidding process of the said project. All concerns and questions shall be discussed on the Pre-Bid Phase.
- 3. The Contractor shall be responsible for carefully examining, comparing and verifying the data furnished by the Plans and specifications, the Contractor shall submit the matter to the Architect or his authorized representative for the proper explanation or necessary correction, before any adjustment shall be made. Any adjustment by the Contractor without such determination shall be at his risk and expense.



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- 4.** Omitted or wrongly described details of work, which are manifestly necessary to carry out the true intent of the drawings and specifications, shall be performed as if fully and correctly set forth and described in the drawings and specifications.
- 5.** The procuring entity may, from time to time, make changes in the specifications and construction drawings. However, if the cost to the Contractor shall be materially increased by such change, the Procuring Entity shall pay the Contractor for the reasonable cost in accordance with the changes.
- 6.** The contractor shall comply with the laws, City or Municipal Ordinances and all government specifications and regulations in so far as they are binding upon or affecting the portion the work hereto. The Contractor or those engaged thereon shall obtain all necessary licenses and permits and pay all taxes or fees, which may due to the local and/or National Government in connection with the prosecution of the work. He shall also be responsible for all damages to persons or property that may occur.
- 7.** Unless otherwise specified, all materials shall be new and free from defects and imperfection. The quality of materials shall be of the best grade of their respective kinds for the purpose. The work shall be performed in the best and acceptable manner in strict accordance with the requirements of the Plans and Specifications. Preference will be given to articles or materials that are locally manufactured, conditions of quality and price being equal.
- 8.** When called for by the Architect / Engineer, the Contractor shall furnish, for approval, full information and satisfactory evidence as to the kind and quality of materials or articles he will incorporate in the work. The contractor shall furnish, for Architect's approval, all samples when so directed.
- 9.** The work shall be in accordance with approved samples. Materials and articles installed or used without such approval shall be at the risk of subsequent rejection. Any failure on the part of the Contractor to conform use materials that are not specified herein shall be under subsequent rejection, unless subject for approval.
- 10.** Any alteration or revision of material usage without approval from the Architect / Engineer shall make the Contractor responsible and liable in terms of guarantee, workmanship and defects.
- 11.** Workmanship shall be in accordance with the best standard practices and all operations required under any and all parts of the Specification shall be undertaken in a neat, workman-like manner. Only skilled personnel with sufficient experience in similar operations shall be allowed to undertake the same.
- 12.** Any alteration or revision on the execution of drawings without approval from the Architect / Engineer shall be under subsequent rejection and shall make the Contractor responsible and liable for any workmanship and execution defects.
- 13.** Defective workmanship shall be remedied by the Contractor, at his expense. He shall not be entitled to any payment hereunder until defective workmanship has been remedied.
- 14.** The Contractor shall provide and maintain adequate weather-tight facilities with water, light, and toilet facilities. He shall keep such places clean and free from flies. He shall remove all connections and appliances connected there with prior to the completion of the Contract and leave the premises perfectly clean.
- 15.** The Contractor shall furnish all temporary water, lights and power and shall pay all expenses in connection therewith. Furthermore, the Contractor shall provide and pay for all water expenses for building purposes that are required by all trades.



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16. The Contractor shall put up safety measures and continuously maintain adequate protection of all his work from damage and shall protect the Procuring Entity's property, as well as all materials furnished and delivered to him by the Entity. He shall make good any such damage, injury or loss, except such as may be caused by agents or employees of the Procuring Entity, or due to causes considered as an Act of God.
17. The Contractor shall enclose the site he possessed by a security fence with gate. Seethrough security fence shall not be allowed.
18. With respect to the construction of the buildings and other structures, the design and specifications shall conform to the standards set by:
- a. Department of Public Works and Highways (DPWH)
 - b. National Building Code of the Philippines (NBCP) National Structural Code of the Philippines, 2010
 - c. Electrical Code of the Philippines
 - d. Sanitary Code of the Philippines
 - e. Plumbing Code of the Philippines
 - f. Accessibility Law
 - g. Fire Code of the Philippines
 - h. Environmental Impact Statement as defined by the DENR other Engineering Standards.

DIVISION 02: SITE CONSTRUCTION

SEC. 02100 SITE PREPARATION:

SCOPE

Furnish equipment and perform labor required to complete demolition of the existing structures, removal of salvaged materials, and disposal of resulting trash, waste, and other vegetation. See drawings for area coverage of work involved.

EXAMINATION OF SITE

Visit the site of the work and examine the premises to fully understand all existing conditions relative to the work. No increase in cost or extension of performance time will be considered from failure to verify and know actual site conditions.

PERMITS

Secure and pay for all necessary permits needed for the work.

PROTECTION

Protect adjacent properties, persons, shrubs, trees, lawns, structures, and utilities against harm or damage.

DISPOSAL OF MATERIALS

1. All salvageable material shall remain the property of the Owner. Hauling and stacking of salvaged materials within a 300 meter radius to Owner's specified storage shall be at the account of the Contractor.
2. All debris and other materials resulting from the demolition work shall be immediately removed from the premises and dumped at sites provided by the Contractor in a manner approved by the Architect.



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DEMOLITION

1. Demolish and remove from site existing structures and other obstructions within the building and as indicated in the plans.
2. Where existing concrete on ground is to be demolished, remove all existing concrete and other obstructions to a depth of 300 mm below grade.
3. Cap all existing utility lines. Consult Owner before commencing work.

CLEARING AND GRUBBING

1. Uproot trees or cut down as shown in the plans or as directed by the Architect.
2. Protect trees indicated in the plans as “trees to be preserved”.
3. Cut down trees in a manner to avoid damage to trees to be preserved. Prevent injury to structures or minimize danger to traffic.
4. Remove trees and roots and holes left behind shall be filled with suitable material and compacted in accordance with Section 02200: EARTHWORK.
5. Grub up or clear undergrowth, bushes, vegetation rubbish and all objectionable materials and dispose in accordance with item 2.01 of the Section.

REPAIRS

Repair damage done to property of any person or persons on or of the premises, by reason of the required work for Demolition. Clearing and Grubbing.

SEC. 02200 EARTHWORK:

SCOPE

- a.) Furnish material and equipment and perform labor required to complete.
 - Stripping
 - Site Grading
 - Trenching
 - Back filling
 - Compaction
- b.) See drawings for location and extent of work required.

VERIFICATION OF EXISTING CONDITIONS

- a.) Verify and examine the site of work to familiarize with the character of materials to be encountered and all other existing conditions affecting the work.

PROTECTION

- a.) Provide adequate protection measures to protect materials, men and adjoining property.
- b.) Provide shoring, sheeting and bracing to prevent caving, erosions, or gullyng of sides of excavation.
- c.) Provide for surface drainage during the period of construction in such manner as to avoid creating a nuisance to adjacent areas. Keep all excavation free of water at all times.

SITE WORK

- a.) Earthwork:
 1. Fill or borrow materials. Granular non-plastic material, laboratory approved, inert materials from off-site source.
 2. Excavated materials used as backfill, approved and clean material. Free of stones not larger than 50 mm (2”) dia. roots and organic materials.
 3. Capillary water sieves, and barrier; uniformly graded or sized, non-porous aggregates or stone respectively.



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- b.) Batter boards: Second class, pest free lumber assembled are rendered secure for proper delineation's of building lines and grades.
- c.) Soil Poisoning: Product and application by Contractor accredited termite and pest control contractor. There shall be no disturbance of treated soil between application of poison and pouring concrete.
- d.) Lawns and Plantings:
 - 1. Topsoil and plant backfill: Fertile, clean, natural soil of the locality. Topsoil shall be spread in a 200mm thick layer over the scarified sub-grade. Compaction 70%.

MATERIALS

- a.) Coarse-grained fill materials, such as stone fragments, sand and gravel mix, fine sand, silty or clayey sand and gravel, shall be laboratory approved from offsite source, passing 75mm (3") sieve. The fraction passing a 0.425mm (No.40). Sieve shall have a liquid limit not to exceed 35% and plasticity index not exceeding 2%. Only coarse grained fill materials shall be used inside buildings and under parking areas, driveways and walkways.
- b.) Fine grained fill material, such as silt, clay, silty clay for clayey silt shall be laboratory approved from the site coarse passing a 0.425mm (No. 40) sieve and shall have a liquid limit not less than 40% and a plasticity index not less than 1%. Only fine grained fill material shall be used outside the limits of the buildings, for landscape purpose.
- c.) Granular fill to form a capillary water barrier shall be clean, crushed non-porous rock, crushed or crushed gravel, uniformly graded and of a size which will pass a 25mm (1") mesh screen and be retained on No.4 mesh screen.
- d.) Excavated material approved for use as backfill shall be free of stones larger than 75mm (3") in longest dimensions roots and organic materials.

STRIPPING

- a.) Strip topsoil only in areas required as shown in the plans. Remove top soil to depth indicated or as required by the Architect but if not less than 150mm in depth, prior to start of regular excavation or backfilling work.
- b.) Stock pile removed top soil separate from other excavated materials in locations designated by the Architect and spread and compact with a light roller in areas indicated in the plans or where directed by the Architect.
- c.) Cut or fill and machine grade the site area. Deposit material in loose layers not exceeding 180 mm in depth and compact to at least 95% of maximum dry density. Rough grade elevations all levels shall be approximately 300mm below the bottoms of slabs on grade, 250mm below paving finish grades and 300mm below finish grade in areas to be lawn seeded or landscaped.

STAKES AND BATTER BOARDS

- a.) Stakes out building accurately and establish grades.
- b.) Batter boards and reference marks shall be erected at location where they will not be disturbed during construction.
- c.) Construct two permanent benchmarks of previously known elevations near the site of construction.

EXCAVATION

- a.) Excavate to the dimensions and elevations indicated on the drawings. Carry excavation to depths directed by the Architect. Should unsuitable bearing be encountered at elevations indicated, contract price shall be adjusted according to the unit price agreed upon by the Owner and the Contractor.
- b.) Excavation carried to a greater depth or size indicated or required through error, shall be corrected by filling such additional depth or size with class "D" concrete at Contractor's expense.



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- c.) Bottoms of excavations shall be level, free from loose material, and brought to indicated or required levels in undisturbed earth or in compacted fill.
- d.) Excavate with proper allowance made for floor slabs, from erection, shoring, drain tile, waterproofing, masonry and adequate space for inspection of foundations.

DEWATERING

- a.) Control grading around building so that ground is pitched to prevent water from running into excavated areas of building or damaging other structures.
- b.) Pump water out of excavated areas throughout the construction period. Water shall not be conducted into adjacent developed property.

TRENCHING FOR SUB-DRAINAGE

- a.) Excavate trenches for underground utility systems and drain lines. Grade and tamp to provide firm bed trenches for drain lines.
- b.) When rock is encountered, excavate to a depth of 150mm below the bottom elevation of the pipe and fill with sand and gravel or crushed stones thoroughly compacted before laying pipe.

BACKFILLING

- a.) Prior to backfilling around structures, remove all forms, trash and debris. Use only approved backfill material and place symmetrically on all sides in layers, compacted in accordance with item 3.08 of this section.
- b.) Backfill around structures only after the concrete has attained sufficient strength to resist lateral pressure resulting from the backfill.

SOIL COMPACTIONS

- a.) Filling material to be used inside the building shall be placed in 200mm thick loose layers. Each layer shall be moistures conditioned and compacted to at least 95% of maximum dry density.

DISPOSAL OF EXCAVATED MATERIALS

- a.) Surplus materials resulting from all earthwork operations not required or unsuitable for fill or backfill shall be disposed of by the Contractor at his expense in areas of the site provided by the Contractor.

SOIL BEARING CAPACITY

1. If during excavation, conditions discovered at the site does not conform to the findings of the "SOIL INVESTIGATION REPORT" submitted by the Soil Engineer, the Contractor shall immediately notify the architect or his representative, in writing of such conditions.
2. The Soil Engineer and the Structural Engineers shall visit the site and make the changes in foundation designs as necessary. Any changes in foundation design and drawings shall be treated as EXTRA WORK covered under Article 20 of the GENERAL CONDITIONS of the CONTRACT.
3. The Contractor may proceed with excavated work but foundation forms and reinforcement shall not be installed until after the receipt of written notice to proceed for the Architect.
4. No footing shall rest on fill.



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DIVISION 03 – CAST-IN-PLACE CONCRETE

I. GENERAL

- A. The General condition applies to all work under this section of the specifications.
- B. Unless otherwise specified, the contractor or his sub-contractor shall furnish all materials, tools, equipment, apparatus, appliances, transportation, labor and supervision required furnishing and placing all the reinforced concrete shown on the drawings.
- C. All concrete work shall be done in accordance with the

“Specifications for Concrete and Reinforced Concrete” as adopted by the National Structural Code for Buildings, and the American Concrete Institutes, “Building Code Requirements for Reinforced Concrete” (ACI-318-71) in so far as they do not conflict or are not inconsistent with specified provisions herein.

II. STORAGE OF MATERIALS

Cement and aggregates shall store in such a manner as to prevent deterioration or intrusion of foreign matter. Do not use deteriorated, contaminated or damaged material for concrete work.

III. SUBSTITUTION OF MATERIALS

Should the contractor desire to substitute any material or brand or manufacturer other than those specified material proposed, the substitution must be equal or superior in quality to the material specified in the specifications. The Contractor shall submit to the Architect or Engineer a written request for approval for the proposed substitution and if possible, shall be accompanied by samples of the proposed substitution.

IV. QUALITY AND PROPORTIONING OF CONCRETE

- A. LABORATORY TEST RESULTS – Submit laboratory test reports for concrete material and mix design test as specified.
- B. MINIMUM REQUIRED ULTIMATE COMPRESSIVE STRENGTH:

The quality of concrete as indicated by test specimen of cylinder at the age of 28 days shall be based on the following:

MIXTURE	STRENGTH
Class “EX-S” concrete	5,000 lbs. per sq. in
Class “AA” concrete	4,000 lbs. per sq. in
Class “A” concrete	3,000 lbs. per sq. in
Class “B” concrete	2,000 lbs. per sq. in
Class “C” concrete	1,000 lbs. per sq. in

All concrete that requires an ultimate compressive strength of 3,000 PSI and above shall be “READY-MIXED CONCRETE” and/or refer to Structural Plans in accordance to NSCP 2015.

- C. PERMISSIBLE WATER-CEMENT RATIOS FOR CONCRETE:



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SPECIFIED MINIMUM COMPRESSIVE STENGTH at 28 DAYS	NON-AIR ENTRAINED CONCRETE	AIR ENTRAINED CONCRETE
2500PSI	7-1/4	6-1/4
3000PSI	6-1/2	5-1/4
3500PSI	5-3/4	4-1/4
4000PSI	5	4

D. PROPORTION: The following proportion served only as guide. The intention is to obtain the desired strength, adjust proportion as necessary to obtain such strength.

- 1. **Class “A” (1:2:3) concrete** shall consist of one (1) part cement to a total of five (5) parts of fine and coarse aggregates measured separately. Verify Construction Notes.
- 2. **Class “B” (1:2:4) concrete** shall consist of at least one
 - (1) Part cement to a total of six (6) parts of volume fine and aggregate measured separately. Verify Construction Notes.
- 3. **Class “C” (1:2-1/2:5) concrete** for all concrete floors on fill shall consist of one part cement to seven and one half (7-1/2) parts of the fine and coarse aggregates measured separately.
- 4. **Method of Measuring:** The method of measuring shall be by cubic foot. One bag of cement (94 lbs.) shall be considered as one cubic foot. Fine and coarse aggregates shall be measured by loose volume and struck off. Cement shall be measured as to insure the desired quantity of successive batches.
- 5. Adequate workability and proper consistency to permit the concrete to be worked readily into the forms and around reinforcements under the conditions of placement to be employed, without excessive segregation or bleeding.

V. TEST ON CONCRETE

- A. The Contractor is required to make test on concrete samples taken from actual pouring on the site, under the supervision of the Architect’s representative or Engineer-in-Charge and to pay and bear all the expenses of the test including transportation of the samples.
- B. Concrete Samples. Throughout the period that concrete is being poured into the forms and while spading operations are being done, sets of test samples in cylinders shall be taken from fresh concrete from the forms. After the samples have been prepared, they should be marked and placed where the Architect’s representative or Engineer-in-Charge may designate and shall be protected from damages and kept moist for a period of twenty-six (26) days.
- C. At least one set, nine (9) pieces of samples shall be taken from each twentyfive (25) cubic meters of Class 4000 PSI, 3000 PSI, and 2500 PSI concrete deposited. Each sample, six (6) inches in diameter by twelve (12) inches long
- D. All samples shall be given identification on name of project, number of samples, proportion of concrete, date taken and where taken (Covered Station).



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DIVISION 04– MASONRY

I.DELIVERY, HANDLING, STORAGE AND PROTECTION

A. MASONRY UNITS

Immediately upon delivery to site, concrete masonry units shall be stocked on platforms or stored in such manner as to protect them from contact with soil or weather. Care in handling masonry units shall be exercised to avoid chipping and breakage. Storage piles, stacks or bins shall be protected from unnecessary traffic construction operations or any kind of damage.

B. LIME AND CEMENT MATERIALS

Cement and lime shall be stored off the ground under weather-tight cover and away from sweating walls and other damp surfaces until ready for use. Damage or deteriorated materials shall be removed from the premises.

II.PRODUCTS/MATERIALS

A. CONCRETE HOLLOW BLOCK

Unless otherwise indicated or specified, concrete hollow blocks shall be in modular dimensions. Block shall be standard machine vibrated and shall have fine, even texture and well defined edges. The load bearing concrete hollow blocks shall have a minimum compressive strength of 1000 lbs. per sq. inch computed from the average of three (3) units based on the average gross area and a minimum of 700 lbs. per sq. inch for the individual unit. For the non-load bearing, 350 lbs. per sq. inch computed from the average of five (5) units based on the average gross area, and a minimum of 300 lbs. per sq. inch for the individual unit.

B. CEMENT

1. Cement shall be PORTLAND CEMENT conforming to ASTM Specifications C-type I.
2. Water for mixing shall be clean, portable and free from injurious amounts of oils, soluble salts, acids, alkalis of organic matter, or other deleterious substances.
3. Sand shall be clean, hard natural sands and free from deleterious substances.
4. Lime shall be Type S; ASTM Specifications C207 for hydrated lime for masonry purpose or quick lime for structural purposes C-5.

C. REINFORCEMENT

1. Lintel and vertical reinforcing bars shall conform to ASTM Specifications A-15 "Specifications for Billet Steel Bars of Concrete Reinforcement". Allowable $f_s = 18,000$ psi.
2. Horizontal reinforcing bars shall conform to ASTM Specifications A-82.
3. For Accent wall, place Lintel beam every 3.0m and Stiffener Column.

III. ERECTION

A. Wet the block thoroughly before using. The first row of blocks must be thoroughly anchored to the concrete walls, columns or slabs. Courses shall be running bond and with vertical faces truly vertical set true to line.

B. All horizontal and vertical reinforcing bars shall be anchored 20-mm diameter into the concrete walls, columns and slabs. Dowel bars properly spaced are placed into the concrete walls, columns and slabs during pouring and hooked to the vertical bar leaving another 20mm diameter exposed to splice with the reinforcing bars of the hollow block walls during construction.



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C. Reinforcements shall consist of 10mm ϕ at 0.80-m vertical bars and 10-mm ϕ horizontal bars at every third course of 100-mm thick concrete hollow blocks. Reinforcement for 150 & 200 mm thick shall be 12 mm ϕ with bar spacing the same as that of 100-mm thick concrete hollow blocks. All cells of concrete hollow blocks below and above ground level shall be filled with 1:3 cement mortars. Bond beam blocks shall be filled with Class "A" (1:2:4). Pour shall be stopped five-(5) cm below the top of a course to form a key at pour joints. Reinforcing bars shall have a lap of 40 mm bar ϕ . All horizontal reinforcements must be tied to the vertical reinforcements at their intersection.

D. Note: Reinforcement of CHB indicated or specified on structural plans shall govern over the reinforcement specified herein.

E. At door and window openings, unless otherwise shown on details, the jamb blocks and beam blocks over opening and below window sill shall be reinforced as follow:

1. Jamb blocks for 100 mm and 150-mm thick walls use two (2) 10-mm ϕ bars.
2. Jamb blocks for 200-mm thick walls use two (2) 12-mm ϕ bars.
3. Beam blocks below window sill, use two (2) 12-mm ϕ bars for 100 mm, 150 mm and 200-mm thick walls.
4. Beam blocks over opening for 100 mm and 150 mm thick walls; use two (2) 12 mm ϕ bar up to 1.20 m wide.
5. Beam blocks over opening for 200-mm walls; use two (2) 12 mm ϕ bar up to 1.5 m wide.
6. Reinforcing bars for beam blocks over opening wider than those specified above are shown on plans.

DIVISION 05– METALS

SEC. 05100 STRUCTURAL STEEL

1. Materials And workmanship shall be in accordance to the requirements of the American Institute of Steel Construction "Manual of Steel for Bridges & Buildings" and American Steel and Iron Institute. All welding materials and workmanship shall conform to the requirements of the American Welding Society.
2. Steel required for this structure should conform to ASTM A-36 for structural grade unless otherwise noted in plans or in the specifications
3. **Shop Painting:**
 - A. Paint shall be delivered to the shop and job in original sealed containers, which shall be clearly marked with the manufacturer's name and the identifying brand number or name. The paint to be used as prepared by the manufacturers shall be without thinning or other admixture.
 - B. All paintings shall be done on dry surfaces, free from rust, scale, and grease. Steel shall be flame-cleaned in the shop to remove mill scale. Surfaces in contact shall be cleaned by effective means but painted, except that the contact surfaces of exposed exterior steel, such as tank supports, shall be painted.
 - C. All steel, except where it is to be encased in concrete shall receive one coat of shop paint. (Surfaces that are to be field welded shall not receive a shop coat.) The shop coat shall be two (2) coats of epoxy-based primer with two (2) coats of topcoat. Primer color shall be different color tone from the topcoat in order to distinguished level of application.



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- D. All rivets, bolts, field welds and serious abrasions to the shop coat shall be spot-painted with the material for the primer coat.

- E. Steel encased in concrete shall not be painted. However, steel with only furring (plaster on exposed metal) shall be painted.

DIVISION 09– FINISHES

This Division applies to all specifications of the Finishes for the Proposed Project.

SEC. 09100 PAINTS AND COATINGS

- 1. For Interior and Exterior Masonry Wall:
 - a. Use Concrete Neutralizer
 - b. First Coat: Flat Latex, 10% Acrylic, water-based Masonry Putty
 - c. Second and Final coat: Semi-gloss Latex Paint

Paint colors: Subject for Architect’s Approval for wall paint color and base board paint color
- 2. For Fiber Cement board:
 - a. First Coat: Flat Latex, 10% Acrylic, water-based Putty
 - b. Second and Final coat: Semi-gloss Latex Paint Paint colors: Subject for Architect’s Approval
- 3. For Metal Surface and wood surface:
 - a. Use Epoxy Primer Gray, finish with two (2) coats Quick Drying Enamel (QDE) Paint colors: Subject for Architect’s Approval Note:

All exposed finish hard wares, plumbing fixtures and accessories, lighting fixtures and accessories, glasses and the like shall be adequately protected that these are not stained with paint and other painting materials prior to painting works. All other surfaces which would be endangered by stains and paint marks should be taped and covered with draft paper or equal.

Protect the work and adjacent work and materials at all times by a suitable covering or by other methods. Upon completion of the work, remove paint and varnish spots from floors, glass and finish hardware.

DIVISION 11– ELECTRICAL

- 1. The bidders shall prepare a design for the electrical system of the building in accordance with the Philippine Electrical Code latest edition, Fire Code of the Philippines, National Building Code of the Philippines and Local Electrical Utility requirements.
 - 1.1. Power supply (Secondary Voltage) from the Calculated Transformer size (with adequate spare capacity) shall be 3Phase, 230V DELTA connection 60 Hz System, with equipment grounding
 - 1.2. Bidder shall include the Power, LED Interior & External Lighting system, Emergency Lighting system, Exit & Directional Sign Lighting/Power Panel board



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and control, wiring & cabling, Protection & Metering system and Sensor and signaling system.

1.3. Bidder shall turn-over the infrastructure and electrical system ready to use.

SECTION 3: PROJECT COST ESTIMATES

The bidders shall submit the quantities and cost of the different types of works to be carried out in accordance with DPWH Department Order No. 72 series of 2012 dated October 5, 2012. In particular, the quantities and cost of each work item shall be calculated and a bill of quantities shall be prepared. The bidders shall draw up a unit price analysis for each of the main pay work items.

The unit price of each of the main work pay items shall include:

- A. Cost of the Preliminary and Detailed Architectural and Engineering Design – Should be in accordance with NEDA guidelines.
- B. Construction Cost of the Project; 1. The Direct Cost are the following:
 - a. Cost of Materials to be used in doing the work item called for, which shall include the following:
 - a.1. Cost of source, including processing, crushing, stockpiling, loading, local taxes, construction and/or maintenance of haul roads, etc.
 - a.2. Expenses for hauling to project site.
 - a.3. Handling expenses
 - a.4. Storage
 - a.5. Allowance for waste and/or losses, not to exceed 5% of materials requirement.
 - b. Cost of Labor:
 - b.1. Salaries and wages as authorized by the Department of Labor and Employment
 - c. Equipment Expenses:
 - c.1. Rental of equipment which shall be based on the prevailing "Associated Construction Equipment Lessors, Inc." (ACEL) rental rates approved for use by the DPWH (Presently it is the 2009 ACEL Rates). Rental rates of equipment not indicated in the ACEL booklet shall be taken from the rental rates prepared by the DPWH Bureau of Equipment. For simplicity in computation, the operated rental rates are preferred over the bare rental rates as the former includes operator's wages, fringe benefits, fuel, oil, lubricants and equipment maintenance. The make, model and capacity of the equipment should be indicated in the detailed unit cost analysis.
 - c.2. Mobilization and demobilization, shall be treated as a separate pay item. It shall be computed based on the equipment requirements of the project stipulated in the proposal and contract booklet. In no case shall mobilization and demobilization exceed 1% of the Estimated Direct Cost (EDC) of the civil works items.
- 2. The Indirect Cost shall consist of the following:
 - a. Overhead Expenses - ranges from 5 - 8% of the EDC, which includes the following:
 - a.1. Engineering and Administrative Supervision.
 - a.2. Transportation allowances.



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- a.3. Office Expenses, e.g., for office equipment and supplies, power and water consumption, communication and maintenance.
- a.4. Premium on Contractor's All Risk Insurance (CARI).
- a.5. Financing Cost.
 - Premium on Bid Security
 - Premium on Performance Security
 - Premium on Surety for Advance Payment
 - Premium on Warranty Bond (one year)
- b. Contingencies - ranges from 0.5 - 3% of the EDC. These include expenses for meetings, coordination with other stakeholders, billboards (excluding Project Billboard which is a pay item under the General requirements), stages during ground breaking & inauguration ceremonies and other unforeseen events
- c. Miscellaneous Expenses - ranges from 0.5 - 1% of the EDC. These include laboratory tests for quality control and plan preparation.
- d. Contractor's Profit Margin – shall be 8% of EDC: for projects above Php5 Million and 10% for projects Php5Million and below
- e. VAT Component - shall be 7% of the sum of the EDC, OCM and Profit. The following items shall not be subjected to OCM and Profit mark-up:
 - e.1. Mobilization and demobilization
 - e.2. Provision of Service Vehicle
- f. The following non-civil works items shall not be subjected to OCM mark-up:
 - f.1. Field/Laboratory Office & Living Quarters (Rental Basis)
 - f.2. Furnishing, Laboratory Equipment, Survey Equipment and Consumables
 - f.3. Assistance to the Engineers
 - f.4. Photographs B.7.5 Health and Safety B.7.6 Traffic Management
 - f.5. Environmental Compliance
 - f.6. Communication Equipment, etc.

SECTION 4: CONSTRUCTION PHASE CONSIDERATIONS

1. Permits and Clearance

The bidders shall defray and all expenses necessary and incidental for the Project be able to secure the Environmental Clearance Certificate (ECC), including the corresponding Tree Cutting Permit (if any tree needs to be cut from the concerned government agencies, if necessary). The contractor shall, upon authorization of the Municipal Government, make representations with the government agencies concerned to expedite the release of the same. Obtain and pay the corresponding fees for all necessary approvals, permits and certificates such as the following:

- 1. Building Permit
- 2. Certificate of Completion of the Building / Occupancy Permit
- 3. All other permits as may be required for the construction



TERMS OF REFERENCE AND TECHNICAL SPECIFICATIONS

2. Temporary Structures & Facilities

The contractor shall provide and maintain the following:

- 1. Temporary office and/or quarters for the contractor’s project team personnel with water, light, telephone and toilet facilities.
- 2. Temporary bunkhouse/quarters for the contractor’s workforce complete with toilet and bath facilities.

3. Mobilization

The contractor shall mobilize all the required project team personnel, equipment, tools and manpower with the required skills and insufficient number as may be necessary for his efficient undertaking of the project.

4. Construction Proper

The contractor shall prosecute all the works under the contract in strict accord with standard engineering methodology and procedures and shall be responsible for maintaining cleanliness and orderliness in the project area throughout the duration of the contract. The Contractor shall deploy qualified workers with necessary certification.

5. Electrification

The contractor shall pay to the local power utility the cost of providing the additional electrical distribution facilities for the project.

6. Material Testing

All material testing shall be conducted by the accredited testing laboratories.

7. Subcontracts

Subcontracting is allowed. The portions of Project and the maximum percentage allowed to be subcontracted are indicated in the **BDS**, which shall not exceed fifty percent (50%) of the contracted Works. Subcontracts were not allowed in Structural, Civil and Architectural Works.

8. Key Personnel

The key personnel must meet the required minimum years of experience set below:

Key Personnel	General Experience	Relevant Experience
1 – Project Engineer/ Architect	5 years	5 years
1 – Structural Engineer	5 years	5 years
1 – Professional Electrical Engineer	5 years	5 years
1 – Safety Officer	5 years	3 years
1 – Material Engineer	5 years	3 years
1 – Foreman	10 years	5 years
1 – Electrician	5 years	5 years
5 – Skilled	5 years	3 years
10 – Helper	1 year	1 year

9. Equipment

The minimum major equipment requirements are the following:

Equipment	Capacity	Number of Units
Excavator	6-10 tons	1



TERMS OF REFERENCE AND TECHNICAL SPECIFICATIONS

Backhoe	0.80 cu.m	1
Concrete Vibrator	-	1
Dump Truck	12 cu.yd	1

SECTION 5: SUBMITTALS

I. BIDDING REQUIREMENTS:

A. Documents Comprising the Bid: Eligibility and Technical Components

4 Copies (1 original copy and 3 triplicate copies) of bid documents

- a. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Section IX. Checklist of Technical and Financial Documents**.
- b. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder’s affairs in the Philippines. For Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an apostille pursuant to GPPB Resolution No. 132019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.
- c. A valid PCAB License is required, and in case of joint ventures, a valid special PCAB License, and registration for the type and cost of the contract for this Project. Any additional type of Contractor license or permit shall be indicated in the **BDS**.
- d. A List of Contractor’s key personnel (e.g., Project Manager, Project Engineers, Materials Engineers, and Foremen) assigned to the contract to be bid, with their complete qualification and experience data shall be provided. These key personnel must meet the required minimum years of experience set in the **BDS**.

A List of Contractor’s major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership, certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be, must meet the minimum requirements for the contract set in the **BDS**.

- e. Construction safety and health program duly signed by the safety officer

B. Documents Comprising the Bid: Financial Component

4 Copies (1 original copy and 3 triplicate copies) of bid documents

- a. The second bid envelope shall contain the financial documents for the Bid as specified in **Section IX. Checklist of Technical and Financial Documents**.
- b. Any bid exceeding the ABC indicated in paragraph 1 of the **IB** shall not be accepted.
- c. For Foreign-funded procurement, a ceiling may be applied to bid prices provided the conditions are met under Section 31.2 of the 2016 revised IRR of RA No. 9184.



TERMS OF REFERENCE AND TECHNICAL SPECIFICATIONS

- C. **Additional Bidding Document Requirements:**
- C.1. Curriculum Vitae of the following:
- a. Structural Engineer
 - b. Professional Electrical Engineer
 - c. Safety Officer
 - d. First Aider
 - e. Materials Engineer
- C.2. Signed and Sealed of Plans with latest copy of PTR and PRC license of the following:
- a. Structural Plans Signed and Sealed by Structural Engineer
 - b. Electrical Plans Signed and Sealed by Professional Electrical Engineer
- C.3. Safety and health program Signed by Safety Officer
- C.4. Duly Signed Construction methodology and schedule

- END OF SECTION -

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