



Project Title : **PROPOSED IMPROVEMENT OF CEA LABORATORIES**  
Location : USTP CDO Campus, C.M. Recto Avenue, Lapasan, Cagayan de Oro City  
Owner : University of Science and Technology of Southern Philippines  
Subject : **PROJECT SPECIFICATIONS**

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## **I. INTRODUCTION**

The drawings and the Specification are complementary to each other. Drawings are graphic means of showing works to be done. They are particularly suited to showing where materials are located. Thus, drawing exists essentially to show sizes, location, and placement. Not all works, however, can be presented in the drawings. Generalized works are usually in statement form; hence the Contractor is strongly advised to read the specification carefully.

Specification on the other hand, is used to describe the materials, construction techniques, samples, shop drawings, guarantee, and the other contract requirements. Together, the Drawings and the Specification are used to inform the contractor. In cases where specified brand carries with it the manufacture's specifications, the manufacture's specification shall hold the precedence over this specification.

## **II. THE LANGUAGE OF THE SPECIFICATIONS:**

The specifications are the abbreviated type and include incomplete sentences. The selection of sentence structure depends on the underlying principles of the specifications:

- a. That the technical specifications are only one part of the Contract Document.
- b. That the contract is between the Owner and the General Contractor; and
- c. That the General Contractor is the only party responsible for completing the work in accordance with the Contract Document

### ***Therefore:***

- A. Only the General Contractor is referred to in the specification so as not to violate the intent of the contract and so as not to undermine the proper chain of command.
- B. Any reference to Specialty Trade Contractors in the technical Specifications is made only in so far a selection of specialty Trade Contractors is made through bidding. Once the Specialty Trade

Contractions are selected and assigned to the General Contractor, the General Contractor assumes all responsibilities for the execution of the whole project in accordance with the Contract Documents. Therefore, in the contract between the Owner and the General Contractor, the Specialty Trade Contractor, the Specialty Trade Contractor is not referred to the entire Contract Document, the work "Contractor" referred to the General Contractor.

- C. The omission of the phrase "the contractor shall" is intentional because the whole specifications are directed to the Contractor. Omitted words or phrases shall be supplied by the interference in the same manner, as they are when a "note" occurs in the drawings.
- D. Where "as shown", "as intended", "as detailed", or words similar import are used, it shall be understood that the reference in the drawings accompanying the specifications is made unless otherwise stated.
- E. Where "as directed", "as required", "as permitted", "as authorized", "as approved", "as accepted", or other words similar import are used, it shall be understood that the direction, requirements, permission, authorization, approval, or acceptance of the Architect is intended unless otherwise stated.
- F. As used herein, "provide" shall be understood to mean "provide complete in place" that is "furnished and installed".

### III. GENERAL REQUIREMENTS:

1. The contractor shall secure from the government agencies all necessary licenses and permits needed.
2. Cleanliness shall be maintained at all times within the job site and its immediate premises.
3. If errors or omissions appear in the drawings, specifications or other documents, these shall be referred to the designing architect.
4. The building site shall be filled up to the required grade.
5. All fills shall be in layers of 0.15m in thickness, each layer being thoroughly compacted by wetting and tamping.
6. All applicable provisions of the different divisions of the specification for each work trade shall apply for all items cited in this summary.
7. Materials deemed necessary to complete the work but not specifically mentioned in the specification, working drawings, of in the Contract Document, shall be supplied and





installed by the Contractor without extra cost to the Owner. Such material shall be of the highest quality available and install and applied in a workmanlike manner at prescribed or appropriate locations.

- 8. Materials specifically mentioned in this Summary shall be installed following efficient and sound Engineering and Construction practice, and especially as per Manufacture's application and installation specification, which shall govern over all works, alluded in this Specification.
- 9. The Contractor shall clean the site and dispose waste after the completion of the project.

**IV. PREPARATION OF SITE:**

- 1. The owner shall take out the building accurately and shall establish grades according to plans and specifications.
- 2. Basic batter board references as directed by the project engineer shall be erected at such places where they will not be disturbed during construction.

**V. SPECIFICATION OUTLINE:**

<b>WORK ITEM</b>	<b>DESCRIPTION</b>
1. Mobilization/Demobilization:	<p>Mobilization shall include all activities and associated costs for transportation of Contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary general facilities for the Contractor's operations at the site</p> <p>Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; including the disassembly, removal and site cleanup, of offices, buildings and other facilities assembled on the site specifically for this contract.</p>
2. Temporary Facilities	: The Temporary Facilities shall consist of: offices, accommodation, toilets, material storage; including payment of water and electric utilities; and access way and fences for security purposes; it includes also the security and protection.

The contractor shall identify the location of the temporary facilities at the construction site. Materials to be used in constructing the temporary facilities shall be constructed at the expense of the contractor.

### 3. Demolition Works and Debris Disposal:

Prior to any structural demolitions taking place, the contractor must identify the location to be demolished of as per drawing. Specify the materials/equipment to be used during the activity. If any damage found, it shall be replaced at the expense of the contractor. All materials such as windows must be kept for transfer purposes and must notify the USTP Engineer for the said activity. All debris must dispose to the specified disposal area as per approval by USTP Engineer assigned.

Wear safety gears during the activity. All the workers, site supervisors and engineers are briefed with the potential hazards and process of demolitions.

### 4. Earthworks

#### 4.1 Excavation

Plan the activity prior to any excavation works. The Engineer must know if there were existing laid pipes or any lines underneath the ground. It must be clear prior to any excavation activities. Specify the location to be excavated as per drawing. Remove the soil and rocks, place it at the specified area. The soil shall be excavated to the required depth to the bottom of the concrete foundation as per drawing.

Use proper tools/equipment during the activities. Practice safety measures throughout the activity.

#### 4.2 Backfilling Works

Backfilling shall be carried out by using suitable material approved by the Engineer and shall be compacted in layers not exceeding 300 mm in depth. Surplus excavated material shall be disposed of by the Contractor as directed by the Engineer.

#### 5. Reinforcement Works

: This Item shall consist of furnishing, bending, fabricating and placing of steel reinforcement of the type, size, shape and grade required in accordance with this Specification and in conformity with the requirements shown on the Plans or as directed by the Engineer.

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 requirements for the size and grade of steel specified.

#### 6. Formworks

: Concrete forms shall be mortar-tight, true to the dimensions, lines and grades of the structure and with the sufficient strength, rigidity, shape and surface smoothness as to leave the finished works true to the dimensions shown on the Plans or required by the Engineer and with the surface finish as specified.

The inside surfaces of forms shall be cleaned of all dirt, mortar and foreign material. Forms which will later be removed shall be thoroughly coated with form oil prior to use. The form oil shall be of commercial quality form oil or other approved coating which



will permit the ready release of the forms and will not discolor the concrete.

Concrete shall not be deposited in the forms until all work in connection with constructing the forms has been completed, all materials required for the unit to be poured, and the Engineer has inspected and approved said forms and materials. Such work shall include the removal of all dirt, chips, sawdust and other foreign material from the forms.

The rate of depositing concrete in forms shall be such to prevent bulging of the forms or form panels in excess of the deflections permitted by the Specification.

Forms for all concrete surfaces which will not be completely enclosed or hidden below the permanent ground surface shall conform to the requirements herein for forms for exposed surfaces. Interior surfaces of underground drainage structures shall be completely enclosed surfaces.

Formwork for concrete placed under water shall be watertight. When lumber is used, this shall be planed, tongued and grooved.

## 7. Concrete Works

: The concrete materials shall be proportioned in accordance with the requirements for each class of concrete as specified in Table 405.2, 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 405.2 - Composition and Strength of Concrete for Use in Structures

Class Of Concrete	Minimum Cement Content Per m <sup>3</sup> kg (bag <sup>**</sup> )	Maximum Water/Cement Ratio kg/kg	Consistency Range in Slump mm (inch)	Designated Size of Coarse Aggregate Square Opening Std. mm	Minimum Compressive Strength of 150x300mm Concrete Cylinder Specimen at 28 days, MN/m <sup>2</sup> (psi)
A	360 (9 bags)	0.53	50 - 100 (2 - 4)	37.5 - 4.75 (1-1/2" - 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	360 (9.5 bags)	0.55	50 - 100 (2 - 4)	12.5 - 4.75 (1/2" - No. 4)	20.7 (3000)
P	440 (11 bags)	0.49	100 max. (4 max.)	19.0 - 4.75 (3/4" - No. 4)	37.7 (5000)
Soal	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

Pedestal shall use Portland cement Concrete ("Class A" mixture, 1:2:4, 3000 psi minimum compressive strength); with the necessary reinforcing bars as indicated in the structural plan.

Floor Slab shall be 3" thick and use Portland cement Concrete ("Class A" mixture, 1:2:3, 3000 psi minimum compressive)

## 8. Scaffolding Works

: Each scaffold and scaffold component must support without failure its own weight and at least four times the maximum intended load applied or transmitted to it. A qualified person must design the scaffolds, which are loaded in accordance with that design. Scaffolds and scaffold components must not be loaded in excess of their maximum intended loads or rated capacities, whichever is less. Each platform must be planked and decked as fully as possible with the space between the platform and uprights not more than 1 inch (2.5 centimeters) wide. The space must not exceed 9 inches (24.1 centimeters) when side brackets or odd-shaped structures result in a wider opening between the platform and the uprights. To ensure adequate protection, install guardrails along all open sides and ends before releasing the scaffold for use by employees, other than the erection and dismantling crews. The structural members, poles, legs, posts, frames, and uprights, must be plumb and braced to prevent swaying and displacement.

All suspension scaffolds must be tied or otherwise secured to prevent them from swaying, as determined by a competent person.

## 9. Masonry Works

: Unless otherwise indicated on the Plans, masonry mortar shall be composed of one part Portland Cement or air-entraining Portland Cement and two parts fine aggregate by volume to which hydrated lime has been added in an amount equal to ten (10) mass percent of the cement.

For masonry walls not exceeding 1.8 m (6 feet) in height, a mortar composed of one-part masonry cement and two parts fine aggregate by volume maybe substituted for the above mixture of Portland Cement, lime and fine aggregate. For other construction, masonry cement may be used if and as shown on the Plans.

Masonry cement shall conform to the requirements of AASHTO M 150 - 74 (ASTM C 91).

Fine aggregate shall conform to the requirements of AASHTO M 45 (ASTM C 144).

9.1 Block laying & Mortar Filler: Concrete Hollow Block shall be of Approved sample (ASTM C129) with minimum compressive Strength of 450 PSI. 100mm (4") and 150 mm (6") thickness as indicated in the plans.

### 9.2 & 9.3

Masonry Plastering & Reinforcement: 6" Concrete Hollow Blocks (CHB) with concrete mix in the hollow core, with reinforcing bars as indicated in the plan. Plain Cement Plaster finished on both side unless otherwise specified.

## 10. Steel Works

: As per plan, use 6in diameter GI Pipe Schd40 for steel columns with 4mm THK Base Plate and Stiffener Plates. Use 4- 12mm diameter Anchor bolts each column. The location of the anchor bolts in relation to the slotted holes in expansion shoes shall correspond with the temperature at the time of erection. The nuts on anchor bolts at the expansion ends shall be adjusted to permit the free movement of the span. Anchor bolt nuts shall be set by center punching the threads of the bolts at the face of the nut.



11. Carpentry Works

: All rough carpentry work shall be in accordance with detail drawings or where not detailed shall be in accordance with recognized carpentry standards. Rigidly construct all wood framing true to line, levels and dimensions and adequately braced, anchored or secured.

Surfaces or wood works in contact with concrete or masonry shall be coated with two (2) coats of asphalt applied hot.

Lumber shall be of the approved quality of the respective kinds of various parts of the work, well-seasoned, thoroughly dry, and free from large, loose or unsound knots, saps, shakes, and other imperfections impairing its strength, durability or appearance. All exposed finishing lumber to be used shall be kiln-dried. All concealed lumber shall be treated with cuprinol or its approved equal.

12. Ceiling Works

: 4.5mm thk Ficem board or approved equivalent on metal furring frames w/ standard thickness and spacing as specified by the manufacturers or supplier, painted with Premium Flat Latex paint color white.

13. Doors

: Refer to Door and Window Schedules, material and workmanship shall be of approved quality. Shall be painted or varnished in gloss finish.

14. Relocation of Windows

: In this item, the windows on its original position shall be moved only as per plan with corresponding dimensions and positions.

15. Roof Framing Works

: The field connections of main members of trusses, bents, plate girders and rigid frames shall be assembled in the shop with milled ends of compression members in full bearing, and then shall have their subsize holes reamed to specified size while the connections are assembled.

The parts shall be accurately assembled as shown on the working drawings and any match marks shall be followed. The material shall be carefully handled so that no parts will be bent, broken or otherwise damaged. Hammering which will injure or distort the members shall not be done. Bearing surfaces and surfaces to be in permanent contact shall be cleaned before the members are assembled.

Where so indicated on the Plans, structural members shall be joined by welding. The welds shall be of the size and type indicated and shall be made by competent operators. Welding shall not be done when surfaces are wet from condensation or rain which is falling on the surfaces to be welded; nor during periods of high winds unless the welding operator and the work are properly protected.

16. Roofing Works

: Materials use shall be as per drawing. See to it that the materials used shall be approved by the Engineer prior to its use.

17. Electrical System

All work hereunder shall comply with the latest Philippine Electrical Code, the rules and regulations of the Electrical Ordinances of Cagayan de Oro City, the rules and regulations other governing authorities and with Republic Act No. 184 as applied or enforced in Cagayan de Oro City, Misamis Oriental.

Upon completion of work as described herein six (6) copies if the "As Built "plans for future reference and maintenance purposes, shall be submitted.

ALL TEMPORARY POWER REQUIREMENTS DURING THE CONSTRUCTION SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. This includes the temporary lighting facilities, power may requirement for power tools. In the case of civil overtime works, which may require power adjustments or alignments, civil work Foreman shall notify the electrical Contractor for overtime staff.

17.1 Wires

All electrical wiring shall be Philflex Columbia or approved equivalent.

17.2 Lighting Fixtures/Receptacles

Lightings shall be Osram, Philips, Toshiba, G.E, Eurolux or approved equivalent. Lighting fixtures are as indicated in the plan. Receptacles & wall plates shall be of approved quality as specified in the plan.

17.3 Control Devices

All control devices shall be Panasonic, Toshiba, Bticino wide series or approved equivalent. Color shall be white.

18. Painting Works

These works includes interior and exterior painting and varnishing and finishing of all items as required producing a finished painting job throughout all of the areas affected by work under this item.

All painting system should be approved by the architect first, and should in accordance to manufactures standards for old and new concrete/ masonry/ metal/ wood surfaces

All paint materials shall meet the requirements of the Standard Specifications of the Standardization Committee on Supplies and shall be delivered on the site in the original containers, with labels intact and seals unbroken.

Clean foreign materials on the surface such as dust, and dirt. Scrape-off loosely adhering old paint film and rust using a brush, broom, chisel, scraper, sandpaper, or other means of removal.

All paints to be used shall be Welcoat Paints, Boysen or its approved equivalent. Color shall be decided by the Architect.

18.1 Masonry/Drywall partitions for Exterior/interior Wall:

Painted with Premium Elastomeric Waterproofing Paint satin finish, color refer to the architect





18.2 Metal Surfaces

Apply rust converter first to metal surfaces, then paint with two (2) coats of high quality metal primers.

19. Plumbing Fixture Works

: All fixtures shall be completely new, free from defects, function efficiently and shall be cleaned, with trims polished and ready for use before acceptance.

All fixtures shall be provided with individual shut-off valves for cold water supplies so that any fixture maybe separately controlled without affecting other fixtures supplied with the same distribution line.

Water running test shall be conducted for all fixtures in order to insure soundness, leakage- free and quiet operation.

20.0 Site Clearing

Site must be cleaned and proper housekeeping must be observed on the construction area prior the turnover of the project.

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