SECTION 02 100: SITE PREPARATION

PART 1: GENERAL

1.01 Scope

a. Work Included:

1. Labor, materials, equipment, plant and other facilities and the satisfactory performance of all work necessary to complete the preparation of site, excavation, and grading.

1.02 Examination Of Site

a. Visit the site of the work and examine the premises to fully understand all existing conditions relative to the work.

b. No increase in cost or extension of performance time will be considered for failure to know its condition.

1.03 Permits

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

1.04 Protection

a. Workmen: Provide adequate measures to protect workmen and passersby in the site.

b. Surrounding area: Streets and adjacent property shall be fully protected throughout the operations.

c. Surface drainage: Provide in a manner to avoid creating a nuisance to adjacent areas during the period of construction.

SECTION 02 200: EARTHWORK

PART 1: GENERAL

1.01 Scope

a. Work Included:

1. Furnish all labor, equipment and materials for excavation and backfilling.
2. Inspect site to survey necessary labor, equipment and materials.
3. Excavation and hauling of excavated materials.
4. Backfilling and grading up to the property line

b. Related Work Specified Elsewhere:

1. Preparation of subgrade for concrete pouring.
2. Preparation of subgrade for asphaltic concrete paving.
3. Trenching and backfilling for storm sewer system.
4. Trenching and backfilling for underground electrical supply.

1.02 Protection

a. Provide adequate bracing and shoring to protect existing construction as may be required.
b. Perform all excavation work with a minimum amount of damage to work which is to remain.
c. Repair any damage caused by negligence of Contractor at his own expense.
d. Provide adequate protection measures for materials, men, and adjoining property.
e. Avoid creating nuisance to adjacent areas.

1.03 Measurement and Payment

a. Excavation shall be measured in its original position by cross-sectioning the area excavated. Volumes will be computed from the cross-section measurements by the average-and-area method.
b. Accepted quantities will be paid for at the contract price per unit of measurement for excavation, including embankment construction.

PART 2: PRODUCTS

2.01 Materials

a. Barrow materials shall be selected, laboratory approved material obtained from off-site sources and having 3.5 percent liquid limit, and 4 to 12 percent plasticity index.
b. Granular fill to form a capillary water barrier shall be clean, crushed non-uniformly graded and of a size which will pass a 25 millimeter mesh screen and be retained on a No. 4 mesh screen.
c. Excavated material approved for use as backfill shall be free of fibers, vegetables or organic materials, boulders, large rocks or pockets, lumps or other concentration of silt, debris, or cinders.
d. No fill material shall be placed when free water is standing in the area where fill is to be placed.

PART 3: EXECUTION

3.01 Preparation

a. Stakes and Batter Boards

1. Stake out the building accurately and establish grades. Secure the approval of the Owner and/or Architect.
2. Erect batter boards and reference mark where they will not be disturbed during construction.
3. Store materials and conduct work in such a manner as to preserve all reference marks.
4. Re-establishment of lines and grades where necessary shall be done at the Contractor's expense.

b. Rough Grading

1. Cut and fill and machine grade the site area.
2. Deposit materials in horizontal layers not exceeding 0.20 meters (8 inches) in depth and compact to 95% of maximum density. (Modified Proctor Test)

3.02 Excavation

a. Foundations

1. Excavate to grade indicated.
2. Excavate trenches to a neat size, leveled to line at the bottom ready to receive the foundation.
3. Excavation greater than required by the drawings and specifications and which is within the bearing area of walls, footings, or floor slabs shall be filled with Class "D" concrete at Contractor's expense.
4. All foundations are designed for an allowable soil bearing capacity of 95.70 kPa (2,000 psf) unless indicated otherwise. Contractor shall report to the Engineer actual soil conditions uncovered and confirm actual soil bearing capacity before any concreting is started.

b. Trenching for Utility and Foundation Drawings

1. Excavate to a point 1.5 meters beyond building line of sufficient distance from the walls and footings to allow placement and removal of forms.
2. Backfill materials and concrete fill. Where excavation is at lower levels or greater depth than required for foundation, or where unsatisfactory material is removed, the excess material shall be replaced with backfill material, except below grade beams, footings and other structural concrete where fills to proper depth or level shall be with concrete of the same strength as specified.

3.03 Dewatering

a. Water encountered during excavation shall be removed by pailing or pumping; care being taken that the surrounding particles of soil are not disturbed or removed.

b. Pump water out of excavated areas throughout the construction.

3.04 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 15 centimeters below the bottom of the pipe, and before pipe is laid, the space below the pipe shall be filled with sand, gravel or crushed stone.

3.05 Soil Compaction

a. All existing earth within building lines that has been disturbed should be placed in 15 centimeters layers and compacted to 95% of maximum density required for fill.

3.06 Disposal of Excavated Material

a. Surplus materials resulting from the site excavating and grading operations shall be removed from the site and disposed off in a proper manner.

3.07 Backfilling and Grading

a. Backfilling

1. Commence after approval of construction below finish grade, underground utility systems inspected and tested, forms removed and the excavation cleaned of trash and debris.
2. Place in layers not more than 15 centimeters thick and evenly compact and ram by wetting, tamping or rolling until the correct grade.

b. Finish Grading

1. Place filling materials in horizontal loose layers not exceeding 15 centimeters in thickness and spread, mix and place in such a manner as to produce a uniform thickness of material.
2. Start in deepest area and progress approximately parallel to finished grade.
3. Grade finish surface to drain water away from the building.

SECTION 02 280: SOIL TREATMENT

PART 1: GENERAL

1.01 Scope

a. Furnish materials and equipment and perform labor required to complete soil poisoning work.

1.02 Examination of Site

a. Visit the site of the work and examine the premises to fully understand all existing conditions relative to the work.

PART 2: PRODUCTS

2.01 Soil Poisoning

a. Soil poison shall be water-based emulsions. One of the following may be used:

1. Benzone Hexachloride - 0.8 percent gamma isomer concentration
2. Chlordane - 1 percent concentration.
3. Deildrin - 0.5 percent concentration.
4. Aldrin - 0.5 percent concentration
5. Heptachlor - 0.5 percent concentration.

PART 3: EXECUTION

3.01 Application

a. Soil poisoning work shall not begin until all preparations for footing and/or slab placement have been completed.

b. Soil poison shall not be applied when soil is excessively wet.

c. After grading and leveling the soil in the ground and layer of gravel laid preparatory to the pouring of concrete, flood or soak every square meter of floor area with soil poison working solution.

d. Thoroughly drench and saturate every linear meter excavation of footings, retaining walls and other foundation work with soil poison working solution before pouring concrete.

e. 5.0 liters of soil poison working solution per linear meter shall be applied to all areas immediately below expansion joints, and all areas, where slab will be penetrated by pipe ducts and other construction features.

f. Hollow masonry walls resting on grades shall have its voids treated with 2.5 liters of soil poison working solution per linear meter of wall. Poisons are poured directly into the hollow spaces.

g. Prior to landscaping of the lawn, saturate every linear meter perimeter of the building about 3 meters wide with soil poison working solution.

h. Treat earth fill thoroughly. As soon as fill is packed and leveled, drench every 1 square meter area with soil poison working solution.

3.02 Inspection and Test

a. One sample of concentrated toxicant shall be tested.

b. One sample of working solution shall be tested for each 1,000 square meter of tested area. There shall be at least two samples tested.

c. Samples shall be taken and analytical tests performed by approved testing laboratory. Test shall be paid for by the Contractor. The results shall be submitted to the Architect.

3.03 Guarantee

a. Upon completion of the work, and a condition of final acceptance, the Owner shall be furnished with a written guarantee which shall provide that: the soil-poisoning treatment shall prevent sub- terranean termites from attacking the building or its contents for a period of not less than 5 years.

SECTION 02 400: SITE DRAINAGE

PART 1: GENERAL

1.01 Scope

a. Furnish materials and equipment and perform labor required to complete the storm drainage system external to the building.
This section includes drop inlets, side inlets, catch basins, manholes, manhole covers and frames, headwalls, culverts, drainage ditches and related rip-rap, concrete raceways and flumes, downspout connections and piping of concrete, asbestos, steel or such other materials suitable for the system.

1.02 Protection

a. Protect materials from loss, injury or defacement. Lost or damaged materials shall be replaced by the Contractor at his own expense.

PART 2: PRODUCT

2.01 Materials

a. Drainage Pipes

1. Plain concrete Drain Pipe and fittings, 10 to 20 centimeters inside diameter: T&G conforming to ASTM C-14-59.
2. Reinforced Concrete Drain Pipes and fittings 25 centimeters and bigger: Centrifugally cast or vibrated T & G conforming to ASTM C-76-59T.

b. Jointing Material - one part cement to two parts sand in proportion with oakum yarning.

c. Building Storm Drain connections to main concrete wye branch and cleanout, T & G. Or use junction boxes.

d. Area Drain Catch Basin - Load-bearing concrete hollow blocks (CHB) or reinforced concrete grating covers as shown on the drawings.

e. Manhole - Precast reinforced concrete sections with galvanized steel ladder rung and cast iron frame and cover.

PART 3: EXECUTION

3.01 Excavation and Pipe Laying

a. Excavate trenches for all underground pipe lines to required depths and grades.

b. Sink bell projections so that pipe will rest on well tamped solid bedding for its entire length.

c. Lay pipes in trenches true to line and grade. Properly bed each section of the pipe and shape trench to fit the lowest 90 degree arc of pipe circumference.

d. Lay water and sewer pipes in separate trenches.

3.02 Backfilling

a. Pipe lines shall be tested by Contractor and by Owner's representative prior to backfilling.

b. Clean and free all excavation from trash and debris.

c. Backfill shall consist of same material excavated or other approved materials. Free backfill of debris and big stones. Place backfill in horizontal layers not exceeding those indicated on the drawings.

d. Carefully place and tamp backfill under and around pipe barrel in such a manner so as not to disturb pipe line and joints.

e. Properly moist each backfill layer and compact by hand or machine to an optimal density that will prevent excessive settlement and shrinkage.

f. Bring backfill to suitable elevation above grade to provide for anticipated settlement and shrinkage.

SECTION 02 480: LANDSCAPING

PART 1: GENERAL

1.01 Division 02 General applies to this Section.

1.02 Verification of Dimensions and Quantities.

a. Before proceeding with work, check and verify dimensions and quantities.

b. Plant totals are for convenience of Contractor only and are not guaranteed. Verify Drawing totals.

c. All planting indicated on Drawings is required unless indicated otherwise.

1.03 Precautions

a. Take care and prepare in work to avoid conditions which will create hazards. Post signs or barriers as required.

b. Provide adequate means for protection from damage through excessive erosion, flooding, heavy rains, etc. Repair or replace damaged area as directed by the Architect.

SECTION 02 485: LAWNS AND PLANTINGS

PART 1: GENERAL

1.01 Scope

a. Furnish materials and equipment and perform labor required to complete: soil preparation lawns.

b. See drawings and details for extent of work required.

c. Plants, trees, and shrubs to be furnished and planted by others.

PART 2: PRODUCTS

2.01 Materials

a. Topsoil - fertile, natural soil, typical of locality, from stones, clay and weeds and as approved by the Architect.

b. Fertilizers and Manures - shall supply nutrients, improve soil structure, aeration and waterholding capacity and promote micro-biological activity.

c. Trees - sturdy, reasonably straight stem according to species intended use. It must have a well balanced branching head or well defined straight and central leader with branches growing from stem in reasonable symmetry.

d. Open-Ground Shrubs - according to species, cut back or trimmed to encourage bushiness.

PART 3: EXECUTION

3.01 Stripping of Soil

a. Strip topsoil to its entire depth from areas to be occupied by building, roads, walks and other structure and pile where it will not interfere with building operations.

b. Strip and pile topsoil before any excavation is begun. Stripped topsoil shall be free from clay, large stones and debris. Use topsoil exclusively for finish grading.

3.02 Placing of Topsoil

a. As soon as practicable after rough grading has been completed and approved, the sub-grade shall be scarified to a depth of 10 centimeters (4 inches). 20 centimeters (8inches) layer of topsoil shall be spread over the scarified sub-grade.

b. Topsoil previously stripped and stockpiled may be used. Contractor shall furnish additional topsoil to provide the thickness specified.

3.03 Fertilizing

a. Prior to placing sod, proper commercial fertilizer shall be uniformly spread over the topsoil.

3.04 Sodding

a. After topsoil is placed, the entire area shall be covered with sod.

b. Sod shall contain a good cover of living grass. Sod shall be out approximately 28 millimeters (1-1/2 inches) thick and be free from weeds, stones, and crab grass.

c. When sod is cut, height of grass shall not exceed 10 centimeters.

d. Sod shall be placed smoothly, edge to edge with staggered joints and then tamped or rolled to eliminate air pockets.

e. On slopes 2 is to 1 and greater, fasten sod in place with wood pegs or other approved methods.

f. Water sod as soon as possible as it shows evidence of excessive drying.

g. Maintain sod for a period of two months after laying. If at the length of two months the building has not yet been completed, continue maintaining the lawn until such a time that the building has been accepted by the Owner. Maintenance shall consist of providing protection against traffic, repairing, damaged or settled areas, refertilizing, watering, weeding and mowing.

3.05 Planting

a. Do not plant when ground is wet or water-clogged. Whenever possible arrange planting so that all plants in one layout or in one section of the layout are put at the same time.

b. Plants that arrive but cannot be planted immediately shall be stored properly and exposed roots covered with damp sacking or protective material.

c. Open trench shall be deep enough to hold roots.

d. Place plants in the trench so that the tops lay at an angle or about 45 degrees. Then fill in trench with soil and trod soil firmly over roots.

e. Large bundles of plants shall be opened before heeling-in so that the roots are in contact with soil.

f. Plants which make a dense mass of ribbons roots, giving a rootball, are lifted with the soil attached and root-ball wrapped in sacking.

g. The rootball shall be soaked in water on arrival without removing the sacking. Place plant in a prepared hole at the correct depth. Cut ties holding the sack, do not remove sacking as it may damage the roots.

SECTION 02 500 ROADS AND PARKING

PART 1: GENERAL

1.01 Scope

a. Furnish all materials, labor, equipment, plant, tools, to complete the roads and parking as shown in drawings.

b. Work shall be done in accordance with the DHP Standard Specifications for Highways and Bridges, 1972 Edition, Special Provisions, and Supplemental Specifications pertaining to this project.

c. Suitable topsoil shall be scraped and deposited in the storage piles as designated by the Architect. This shall be used later for finishing exposed slopes and surfaces of earth sections.

d. Extent of work shall be as shown on the drawings and specifications.

1.02 Basis of Payment for deletions or additions shall be in unit quantities as per submitted Unit Prices on the Proposal Form.

PART 2: PRODUCTS

2.01 Materials

a. Barrow Material - shall be selected laboratory approved, pit run gravel, talus rock disintegrated, granite, sand shale cinders, coral, or other similar materials selected. It should not contain more than 35% passing the No. 200 sieve and the fraction of the material passing the No. 40 sieve shall have a liquid limit not greater than 35 and plasticity index not greater than 12.

b. Crushed Stone Base Course - shall consist of hard durable fragments of stone and a filler of sand or other finely divided mineral matter. The composite base course materials shall be free from vegetable matter and lumps or balls of clays, and shall meet the requirements for base course as called for in the DPH Specifications.

Grading Requirements shall be as per AASHO Methods T-11 and T-27.

REQUIREMENTS FOR GRADING	
Sieve Designation *(Square Mesh Sieves)*	Percent Weight Passing *Type "B" Base Course*
38 millimeters (1-1/2")	100
25 millimeters (1")	85 - 100
No. 4	20 - 45
No. 200	5 - 12

c. Asphaltic Materials

1. Shall be made from an asphaltic base petroleum homogeneous and free from water, except Emulsified Asphalt which is made from and emulsion of asphalt and water. Asphalt shall not have been distilled at high temperature and shall upon arrival at the site not show sign of separation into lighter and heavier components.
2. All tests shall be as per AASHO Specifications or methods

PART 3: EXECUTION

3.01 a. Placing and Spreading of Base Coarse

Placing shall be placed on the prepared sub-grade and compacted in layer to the thickness shown on the plans. Materials shall be deposited and spread in a uniform layer and without segregation of size. Spreading shall be from dump boards, spreader boxes or mechanical equipment.

b. Mixing Base Coarse Materials

After depositing on the prepared sub-grade, it shall be thoroughly mixed to the full depth of the required layer by means of a self-propelled or tractor-drawn blade grader having a wheel base of at least 4.6 meters, and weighing not less than 3,048 kilograms. In order to prevent segregation of particle sizes and to aid in compaction of the materials.

c. Rolling Base Coarse

1. Immediately following the final mixing and spreading, all materials shall be compacted to full by rolling with a 3-wheeled or tandem roller weighing at least 8,128 kilograms or with a multiple-wheeled rubber-tired roller loaded and directed to give satisfactory compaction.
2. Rolling shall progress gradually from the sides to the center, parallel with the center line of the road and it shall continue until compaction is satisfactory to the Engineer.
3. After rolling all the base coarse materials the surface shall be bladed and smoothened. Blading and rolling shall be performed alternately as required or directed to maintain a smooth, even surface.
4. Base coarse materials shall be machine tamped along curb, headers or walls and at all places not accessible to rollers.
5. All layers of loose materials shall be sprinkled with water during rolling, tamping and blading.

d. Spreading of Choker Aggregate

1. After final rolling of coarse aggregates, choker aggregate shall be spread evenly over the surface until the voids are filled up to within approximately 1 centimeter of the surface and if possible the surface shall be broomed with push brooms and diagonal brooms.
2. After spreading and brooming, rolling is again started and adding and spreading of choker aggregate is repeated until a smooth surface is obtained.

e. Application of Bituminous Materials

1. First Application - shall be done after rolling the coarse and choker aggregate and shall not be done during rainy weather.
   Application shall be uniformly applied in the amount specified on the tabulation below.
2. Second application - shall be done after the spreading of the key aggregate and its rolling is done. Surface shall be swept clean of all loose materials and application shall be done uniformly in the amount specified in the table on the next page.

Sequence of Placing Operations and Approximate Amounts of Materials required per Square Meter

	Bituminous Material (liters per sqm.)	AGGREGATE			
		Coarse kls./sqm.	Choker kls./sqm.	Key kls./sqm.	Cover kls./sqm.
First Spreading		90			
Second Spreading			10		
First Application	3.5				
Third Spreading				10	
Second Application	3.5				
Fourth Spreading				8	
Third Application	2.0				
Fifth Spreading					8
TOTAL	9.0		126		

The required amounts given in the above tabulation for each application and spreading approximate and the exact amount shall be set by the Engineer. Total amounts of bituminous material per square meter may be varied by the Engineer to fit conditions, but the total amount of aggregate per square meter shall be that required by the table, corrected only for specific gravity.

SECTION 02 528 CONCRETE CURBS, GUTTER AND SIDEWALKS

PART 1: GENERAL

1.01 Scope

a. Furnish all materials, labor, equipment, plant, tools to complete the concrete curbs and gutters including sidewalks as shown on the drawings.

b. Related works specified elsewhere:

1. Concrete, Division 3.

1.02 Protection

a. Protect all materials from dirt, and injurious substances that may affect the strength of concrete and cement.

1.03 Payment

a. Basis of payment for deletions or additions shall be measured in cubic meters measured in place with the unit prices in accordance with the unit prices on the Proposal Form.

PART 2: PRODUCTS

2.01 Materials

a. Cement shall be as per ASTM Standard Specifications for Portland Cement (ASTM Designation C-150 Latest Revision) for Type 1 Portland Cement.

b. Concrete Aggregates

1. Aggregates shall be well-graded, clean, hard particles of sand or crushed rock conforming to the "STANDARD SPECIFICATIONS FOR CONCRETE AGGREGATES". (ASTM Designation C-33 - latest revision).
2. Sand - shall be coarse sand free from injurious materials. Sand from salt water are not allowed.

c. Water - shall be clean and free from injurious amounts of oils, acids, alkali, organic materials or other deleterious substances.

d. Forms - shall either be wood or steel.

e. Controlled Strengths of Concrete - concrete shall develop a minimum 28-day cylinder strength of 17.23 MPa (2,500psi).

PART 3: EXECUTION

3.01 Excavation and Bed Preparation

a. Excavate to required depth and true to line and grade. All soft and unstable materials shall be removed and replaced with good suitable material acceptable to the Engineer.

b. Provide granular material such as gravel or cinder to form a bed for the combination curb and gutter.

3.02 Formwork

a. Formwork for at least 3 meters of curb and gutter, except on curves shall be prepared and checked for alignment and grade.

b. Removal of form shall be allowed 24 hours after pouring of concrete.

3.03 Concrete Placement

a. Concrete may be placed in gutter to the full depth required. It shall be placed in layers not exceeding 12 centimeters.
Top of curb and gutter shall be floated smooth. Finishing of concrete shall be done by pure cement when concrete has not set.

b. Joints: Provide construction joints at a maximum spacing of 5 meters which shall be separated by use of steel or wood templates and later filled up with roofing paper dipped in asphalt or a pre-moulded expansion joint.

c. Curing

1. Surfaces shall be protected and cured within 24 hours. It should always be kept moist to prevent cracks.
2. It should also be covered with plastic or canvass during heavy downpour.

DIVISION 03 000 CONCRETE

PART 1: GENERAL

1.01 General Conditions and Division 01 apply to this Division.

1.02 Scope

a. Includes:

1. Furnish labor, materials, and equipment necessary for completion of work unless indicated or noted otherwise.
2. Application or installation of concrete accessories.

b. Furnished by Sub-contractor but installed by this Section:

1. Inserts, bolts, boxes, templates, and fastening device for other work, including those for bases only for Mechanical and Electrical, shall be provided by Sub-contractor involved.

c. Related Work Specified Elsewhere:

1. Electrical, Plumbing and Mechanical devices including boxes, conduits, pipes, hangers, inserts, and other work to be embedded in concrete shall be furnished and installed by Sub-contractor involved prior to pouring unless arranged differently by Contractor.

SECTION 03 100 CONCRETE FORMWORK

PART 1: GENERAL

1.01 Scope

a. Work Included:

1. All labor, materials, equipment, plant, tools and other facilities necessary to complete all concrete formwork whether cast-in-place or precast.
2. Refer to General Conditions.
3. Work shall be done in accordance with the "SPECIFICATIONS FOR CONCRETE AND REINFORCED CONCRETE" as adopted by the Department of Public Works, Philippines, and the "REQUIREMENTS FOR REINFORCED CONCRETE (ACT 318-63)", insofar as they do not conflict with specific provisions.

1.02 Protection

a. Provide forms that will produce correctly aligned concrete.

b. Choice of fitting shall be done correctly.

c. Support of forms shall be done rigid and extra care must be exercised in considering weights and side pressure.

PART 2: PRODUCTS

2.01 Materials

a. Forms:

1. Plywood, metal, plaster of Paris or plastic materials or surfaced lumber forms shall be used for all concrete work whether cast-in-place or precast.
2. In no case shall the forms for beams and slabs be less than 12.3 millimeters (1/2") thick plywood for exposed concrete, 20 millimeters (3/4") T & G for covered concrete.

b. Quality: Provide forms that will produce correctly aligned concrete. Plastering in general shall not be allowed so that care shall be exercised in the choice of surface of forms and fittings that will be in contact with concrete.

PART 3: EXECUTION

3.01 Preparation

a. Check all formwork for plumbness and correct alignments.

b. Provide openings for column forms for cleaning and inspection preferably at lowest points of pour lifts.

c. Provide camber as indicated in construction notes.

3.02 Forms and Shoring

a. Removal:

1. Forms and shoring shall not be removed until concrete is adequately set and strong enough to withstand anticipated loadings and in no less than what is required in the following tabulations:

Parts of Structure	Classification of Parts	Time Required
Footings	a) Massive footing	a) 1 day (24 hours)
	b) Cantilever footing	b) 4 days (120 hours)
	c) Slab footing	c) 5 days (121 hours)
Walls and Pilasters	a) Massive walls, 30 centimeters	a) Up to 60 centimeters (2 ft.) high - 1 day (24 hours). Add 1 day for additional 90 cm. (3 ft.) of height or fraction thereof.
	b) Thin walls - less than 30 cm.	b) Up to 180 cm. (6 ft.) high - 2 days (48 hrs.). Add 1-1/2 days (36 hrs.) for every additional 90 cm. of height or fraction thereof but not more than 28 days (672 hrs.).
	c) Cantilever walls d) Buttresses e) Counterforts f) Diaphragm	c) to f) without loads same as a & b.
Columns	a) Ratio of height to least dia. up to 4.	a) 2 days (48 hours)
	b) Add to the above least 15.	b) Ratio of height to dia. from 4 to number 1 day (24 hrs.) for every additional 90 cm. (3 ft.) of height or fraction thereof but not more than 28 days (672 hrs.).
Slabs	a) 90 cm. (3 ft.) to 210 cm. (7 ft.) span	a) 90 cm. (3 ft.) span - 5 days (120 hrs.). Add 1/2 (12 hrs.) for every 30 cm. 1 ft.) span or fraction thereof.
	b) Over 210 cm. (7 ft.) span.	b) 210 cm. (7 Ft.) span - 7 days (168 hrs.). Add 1/2 day (12 hrs.) for every 30 cm. (1 every 30 cm. (1 ft.) additional span or fraction thereof but not more than 28 days (672 hrs.).

2. Forms and shorings may be removed earlier than specified above provided that test samples of concrete are taken and are shown to be adequately strong to carry safely, dead and construction loads to the satisfaction of the Engineer.

SECTION 03 200 CONCRETE REINFORCEMENT

PART 1: GENERAL

1.01 Scope

a. Related Work Specified Elsewhere

1. Concrete Formwork: Section 03 100
2. Masonry: Division 04
3. Moisture Control: Division 07

1.02 Protection

a. Storage of Materials: Steel reinforcements shall be stored under cover or otherwise prevented from rusting.

b. Concrete cover shall be determined before concrete pouring is started.

1.03 Design Condition

All steel reinforcements shall be designed in accordance with ACI Building Code (ACI 318-63) and Uniform Building Code (Latest Edition).

1.04 Testing

The Owner, his duly authorized representative or the Architect shall have the right to order the test of any steel supplied by the Contractor or the Owner entering into the concrete or reinforced concrete. Such tests shall conform to the ASTM Designations enumerated below on materials. Samples shall be provided by the Contractor without cost to the Owner and expenses for testing shall be borne by the Contractor and copies of results shall be furnished the Owner and the Architect.

1.05 Measurement and Payment

Steel reinforcement shall be measured by weight either in kilograms or tonnes and shall be paid to the Contractor based on steel weights as per unit price submitted on the proposal form. Steel bars that are not installed shall not be paid for by the Owner.

PART 2: PRODUCTS

2.01 Materials

a. Steel Bars:

1. Reinforcing steel bars to be used shall be new and free from rust, oil, grease or kinds.
2. Shall conform to the latest edition of ASTM Designation A615-68 Specifications.
3. Reinforcing Steel shall be: Intermediate grade - For 16 mm diameter and above.
   Structural grade - For 12 mm diameter and below.
4. Ties and stirrups for beams and columns as well as slab reinforcements may be plain bars unless noted in the plan or specified herein.

PART 3: EXECUTION

3.01 Preparation

a. Remove all loose rust or scale, adhering materials and oil or other materials which tend to destroy bond between concrete and reinforcement before steel is placed or before pouring.

b. All bars shall be bent cold.

3.02 Placing Reinforcements

a. Metal Reinforcements

1. Placing shall be in accordance with the plans furnished. Refer to the Architect in case of doubt or ambiguity in placing of steel.
2. Reinforcing bars shall be accurately placed and adequately secured by concrete metal wires, or metal chair spacers.
3. Spacing of bars shall be done in accordance with the ACI - Building Code or as follows: Clear distance between parallel bars shall be one and one half (1-1/2) times the diameter for round bars, and twice the side dimension for square bars.
4. Clear distance shall not be less than 2.54 cm. (1 inch) nor more than 1-1/3 times the minimum size of aggregates.
5. Where bars are used in two or more layers, the bars in the upper layers shall be placed directly above those in the lower layers at a clear distance of not less than 2.54 centimeters (1 inch).

b. Stirrups and Ties

1. Bends for stirrups and ties shall be made around a pin having a diameter of not less than 6 times the minimum thickness of the bar, except that for bars larger than 2.54 centimeters (1 inch), the pin shall not be less than 8 times the minimum thickness of the bar.

3.02. Offset and Splices in Reinforcement

a. Splices

1. In slabs, beams and girders at points of maximum stress shall be generally avoided, and may be allowed only upon written approval of splice details by the Engineer.
2. Provide sufficient lap to transfer stress between bars by bonding shear or by welding.
3. Splices in adjacent bars shall be generally staggered.

b. Offsets - Where changes in cross section of columns occur, longitudinal bars shall be offset in a region where lateral support is afforded. Where offset, the scope of the included portion shall not be more than one in six (1:6) and in case of tied columns the ties shall be spaced in 7.5 centimeters on center for a distance of 30 centimeters (1 foot) below the point of offset.

PART 1: GENERAL

1.01 Scope

a. Related Works Specified Elsewhere
   1. Concrete Formwork: Division 03 Section 03 100
   2. Concrete Reinforcement: Division 03 Section 03 200
   3. Masonry: Division 04
   4. Moisture Control: Division 07
   5. General Conditions

b. Foundations and Bedded Slabs

c. All other structural concrete member except precast concrete.

1.02 Protection

a. Cement and aggregate shall be stored in such a manner as to prevent deterioration on intrusion by foreign matter.

b. Deteriorated or damaged materials shall not be used for concrete.

1.03 Measurement and Payment: Cast-in-place concrete shall be measured in cubic meter and payment shall be based on the actual poured volume using the unit prices on the proposal form.

1.04 Design Conditions: All strengths of concrete shall be as indicated on the construction notes.

PART 2: PRODUCTS

2.01 Materials

a. Cement: Portland cement shall conform to the Standard Specifications for Portland Cement (ASTM Designation C-150, Latest Revision) for Type I Portland Cement.

b. Concrete Aggregates:
   1. Well graded, clean, hard particles of gravel or crushed rock conforming to the "STANDARD SPECIFICATIONS FOR CONCRETE AGGREGATES" (ASTM Designation C-33, Latest Revision).
   2. Maximum size of aggregate shall not be longer than 1/5 of the narrowest dimension between sides of the forms nor larger than 3/4 of the minimum clear spacing between reinforcing bars, and in no case larger than 2.5 centimeters in diameter.

c. Water shall be clean and free from injurious amounts of oils, acids, alkali, organic materials or other deleterious substances.

d. Concrete Additives

   1. Calcium Chloride in the amount of not more than 630 grams per 40-kilo bag of cement may be used as an accelerator and curing agent with the prior approval of the Engineer.

2. Pozzolith 3R or Daratard shall be used in the amounts as recommended by the Manufacuter in the following:

   a) Open terrace floor slabs and roof slabs.
   b) Concrete parapets and concrete gutters.
   c) All columns.
   d) All core walls, retaining walls, basement walls, ramps and water tanks, if any. The use of additives does not relieve the Contractor of the obligation to produce the concrete strengths in Section 2.02.

2.02 Controlled Strengths of Concrete

a. Concrete for all columns, beams, girders, walls, framed slabs, stairs, footing foundations, roof slabs, and gutters shall develop a minimum 28-day cylinder strength of _____. (See Construction Notes)

b. Concrete for bedded floor slabs, walks, manholes, catch basins, curbs and gutters, pavements shall develop a minimum 28-day cylinder strength of _____. (See Construction Notes)

2.03 Method of Determining Strength

The Contractor shall submit mix designs obtained from samples made in accordance with "STANDARD METHOD OF TAKING AND CURING CONCRETE COMPRESSION AND FLEXURE SPECIMENS (ASTM Designation C192)" and "STANDARD METHOD OF TESTING COMPRESSIVE STRENGTH OF MOLDED CONCRETE CYLINDERS (ASTM Designation C39)" for each strength required stating the proposed slump and the proportional weights of cements, saturated surface dry aggregates, and water. These mixer shall be proved by preliminary tests 30 days before concreting and shall show a 23-day strength of 15 percent higher than the ultimate required. No substitutions shall be made in the materials or mix without additional tests to show that the quality of concrete is satisfactory.

2.04 Concrete Proportions and Consistency

a. Cement and Aggregate: Proportions shall be such as to produce a concrete mixture which will work readily into the corners and angles of the forms and around reinforcement with the method of placing materials to segregate, or excess free water to collect on the surface. The combined aggregates shall be of such composition of sizes that when separated on the No. 4 U.S. Ltd. sieve, the weight passing the sieve (fine aggregate) shall not be less than 30 percent nor greater than 50 percent of the total, except that these proportions do not necessarily apply to lightweight aggregates.

b. Measurement:

   1. Concrete materials shall be measured preferably by weight such that the proportion can be accurately controlled and easily checked at any time during work.
   2. Measurement of materials for ready mixed concrete shall conform to STANDARD SPECIFICATIONS FOR READY MIXED CONCRETE, ASTM Designation C94, where applicable.

3. The water content shall, in no case, exceed 27 liters per bag of cement for all portions in the structure. Slumps shall be within the following limits:

Portions of Structure	*Slumps (Centimeters)*
Columns and end supported beams, girders, slabs	7.5 - 15
Foundation elements, bedded slab and cantilevered beams and slabs	5.0 - 10

c. Job Mix Adjustment of Water Content: Shall be allowed only on permission of the Engineer and provided that cement is also added to keep the original water cement ratio of the design mix.

2.05 Mixing Concrete

a. No hand mixing shall be allowed, except in case of emergency such as mixer breakdown during pouring operations and shall stop at the first allowed construction joint. All concrete shall be machine mixed for at least 1-1/2 minutes after all materials including water are in the mixing drum.

b. The mixer shall be of an approved size and type which will ensure a uniform distribution of material throughout the mass, it shall be equipped with a DEVICE FOR ACCURATELY MEASURING AND CONTROLLING THE AMOUNT OF MIXING WATER IN EACH BATCH.

c. Placing of material in mixer shall be done in such a way that first batch of concrete materials placed in the mixer shall contain sufficient excess of cement, sand and water to coat the inside of the drum without reducing the cement content of the mix to be discharged.

d. Re-tempering of concrete shall not be permitted.

PART 3: EXECUTION

3.01 Preparation

a. Forms:

1. Shall be inspected, cleaned and all installations checked before concrete is placed.
2. Surfaces shall be thoroughly wet and grouted before placing concrete.
3. All laitance from previous pouring shall be renew pouring.

3.02 Depositing Concrete

a. 1. Depositing shall be done without segregation, rehandling or flowing of concrete. It shall be done with the use of buggies, buckets, or wheel barrows. Use of chutes will not be allowed except to transfer concrete from hoppers to buggies, wheelbarrows or buckets in which case shall not exceed 6 meters in aggregate length.
2. Placing of concrete with a free drop or fall of more than 1.5 meters are not allowed.
3. Conveyors when used shall be kept full of concrete and ends shall be kept buried in the newly placed concrete as pouring progresses.

b. Vibration:
1. No placing of concrete will be allowed without vibrators.
2. Segregation due to over vibration shall be avoided.
3.

c. Construction Joints:
   1. If possible, concreting shall be done continuously until section is complete. When stoppage of concrete operations occur, construction joints shall be placed either horizontally or vertically as indicated by the Engineer and provided with shear keys or dowels to develop bond.
   2. Construction joints shall be as per plan or shall be approved or as directed by the Engineer.

3.03 Curing Concrete

a. Finished Surface
   1. Keep concrete continuously wet or moist for at least one week after placing.
   2. Floors and vertical surface may be sprayed with an approved retarder.
   3. Curing shall begin as soon as concrete has attained initial set.

b. Curing additive may be used. A minimum of 48 hours continuous moist curing after placing of concrete shall be done after which subsequent additional curing can be dispensed with.

c. Roof Deck and Terraces: Concrete roofing shall be moist cured at least seven (7) days irrespective of whether curing additives is used or not.

3.04 Repair of Concrete

a. Imperfections:
   1. Repairs shall be completed within 24 hours after removal of forms.
   2. Fins shall be neatly removed from exposed surfaces.

b. Large Bulges: Where present large bulges and abrupt irregularities protrude, it shall be removed by bush hammering and grinding.

c. Drypack Filling
   1. Shall be used for holes having at least one surface dimension less than the depth of the hole.
   2. Holes left by the removal of fasteners from the ends of rods; for grand and pipe recessed, and for narrow slots cut for repair of cracks shall also be filled with dry pack.
   3. Drypack shall not be used for filling behind reinforcement and for filling holes that extend completely through the concrete.

d. Mortar filling placed under impact by use of mortar gun shall be used for holes too wide for drypack filling and no deeper than the far side of the reinforcement nearest the surface.

e. Concrete filling shall be used for holes extending entirely through the concrete, for holes which are greater in area than 1,000 square centimeters and deeper than 10 centimeters and for holes in reinforced concrete which are greater in area than 500 square centimeters and which extend beyond reinforcement.

f. All materials, procedures and operations used in the repair of concrete shall be as directed.

g. Fillings shall be bonded tightly to the surface of the holes and shall be sound and free from shrinkage, cracks and drumy areas after the fillings have cured and dried.

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h. The cost of all materials, labor and equipment used in the repair of all materials shall be borne by the Contractor.

3.05 Floor Finishes

a. Shall be noted carefully by the Contractor. Prepare the slabs suitable in surface and elevation to receive such finishes.
   1. Where plain cement floor finish is specified, same shall be bonded. The slab shall be brought to a true surface 2 centimeters - 1.3 centimeters (3/4" to 1/2") below finished floor elevation and it shall be roughened by being naked as it sets. At a later date, when it is time to apply the finish, the slab shall be thoroughly cleaned by brushes and with a small jet from a high pressure hose.
   2. All dirt shall be removed from crevices and depressions. After the surface has been wet, it shall be grouted with 1:1 grout. The 2 centimeters (3/4") sand finish composed of 1 sand mixed with 7.6 - 11.4 liters (2 to 3 gallons) of water per bag of cement shall be supplied, rammed, screened and floated. This shall be trowelled when sufficiently dry to a smooth hard finish using a light dusting of cement only.
   3. Coloring admixtures shall be as determined by the Architect.

3.06 Test on Concrete

a. Reasonable number of tests on the concrete may be required by the Owner during the progress of the work. Not less than four (4) cylindrical specimens shall be made for each test of which at least two (2) shall be reserved for the 28-day test. Not less than one (1) test shall be made in case less than on (1) test for each day's concreting. Samples shall be secured and molded in accordance with "METHOD OF SAMPLING CONCRETE (ASTM Designation C172) and METHOD OF MAKING AND CURING CONCRETE COMPRESSION AND FIXTURE TEST SPECIMENS IN THE FIELD (ASTM Designation C31)". The Contractor shall provide the samples to be taken at the place of deposit and as specified by the Engineer, without cost of testing the samples. The Contractor shall take care of transporting the samples to the approved testing laboratory without the cost to the Owner.

b. To conform to the requirements of these specifications, the average strength of test samples representing each class of concrete as well as the average of any five consecutive strength tests representing each class of concrete, shall be equal to or greater than the specified strength and not more than one strength test in 10 shall have an average value less than 90 percent of the specified strength.

c. Should the tests fail to give the required strength the Owner shall have the right to order a change in proportions or in the procedure of curing of the concrete for the rest of the structure.

3.07 Liquidated Damages (for failure to meet concrete strength requirements)

a. For failure to meet the specified strength of concrete which has been designed, prepared, and deposited by the Contractor, the Contractor shall pay the Owner as liquidated damages and not as penalty on the amount of concrete represented by the samples.
   1. For concrete less than 100% but greater than 90% of specified strengths, payment of _____ per cubic meter of concrete.

2. For concrete less than 100 % but greater than 80% of specified strength, payment of _____ per cubic meter of concrete.
3. For concrete with less than 80% of the specified strength, removal of the concrete so deposited and replacement of same at the expense of the Contractor or payment by Contractor of _____ per cubic meter at the discretion of the Engineer.

b. In any case of failure to meet specified strengths, the Contractor may, at his expense, obtain concrete core sampling from the poured concrete and the compressive strength of same as determined by the competent testing authority shall be taken as conclusive evidence of its strength and integrity, provided the borings will not impair the safety of the structure and can be satisfactorily replaced. To determine adequacy of affected parts, the Owner shall have the option to order load tests on parts of the structure where concrete strength tests are below 80% than specified. These tests are to be in accordance with ACI 318-63 recommendation and their costs are to be borne by the Contractor.

c. In case of failure of samples to meet specified strength of the extent measured in 1) or 2) above, the Contractor shall be required to prolong the curing of the poured concrete as directed by the Engineer, in addition to the payment for the liquidated damages mentioned above in a).

SECTION 03 400 PRECAST CONCRETE

PART 1: GENERAL

1.01 Scope

a. Furnish materials and equipment and perform labor required to complete all precast concrete work.

b. See drawings for sizes, details, location, anchorage and other information relating to precast work.

1.02 Qualification of Fabricator

a. Procure precast components form experienced fabricators subject to Architect's approval as per Article 25 of the UAP General Conditions.

1.03 Samples

a. Three (3) samples of precast panels measuring 1.20 by 1.20 meters showing texture and exposed aggregate should be submitted 10 days before bidding to the Architect in order that the Contractor will have a fair basis on the finish required by the Architect.

1.04 Mock-Up

a. Make a full-size structural model for approval prior to manufacture of all precast units.

1.05 Delivery And Storage

a. Do not transport precast units from casting beds before fc' = 20.67 MPa (3,000 psi) is attained.

b. Store precast units in vertical position.

PART 2: GENERAL

2.01 Materials

a. Cement - conforming to standard specifications for Type 1 Portland Cement (ASTM Designation C-150, Latest Edition)

b. Coarse Aggregates - well graded, clean, hard particles of gravel or crushed rock and clean washed sand.

c. Fine Aggregates - clean, washed "Porac" sand

d. Water - clean and free from injurious amounts of oil, acids, alkali, organic materials or deleterious substances.

e. Concrete Additives - "Pozzolith" or "Daratard" to reduce water-cement ratio

f. Reinforcements - structural grade.

2.02 Controlled Strength of Concrete

a. Concrete shall have fc' = 20.67 MPa (3,000 psi) in 28 days.

PART 3: EXECUTION AND INSTALLATION

3.01 Placing of reinforcements - reinforcing bars shall be firmly secured and welded and held in position in the forms to avoid displacements during the placing of concrete.

3.02 Lifting - lift precast only at pick-up points as indicated in the drawing. Do not lift the precast panel at any other points.

3.03 Lifting Hooks - after placements of precast units into position, bum-off lifting hooks close to concrete and fill concrete depressions with mortar.

3.04 Texture - tool finish texture showing exposed aggregates must be done mechanically by means of pneumatic hammer.

SECTION 03 450 PRECAST PLASTER OF PARIS

PART 1 GENERAL

1.01 Scope

a. Furnish materials and equipment and perform labor required to complete all precast plaster of paris work.

b. See drawings and details for location, quantity and other requirements.

1.02 Qualification of Fabricator

a. Procure precast components from experienced precast fabricators subject to the Architect's approval as per Article 35 of the UAP General Conditions.

1.03 Samples

a. Submit sample panels unharmed and free from damage.

1.04 Delivery

a. Deliver precast panels unharmed and free from damage. Delivery shall be timed such that materials received shall be installed immediately upon receipt.

1.05 Protection

a. Protect finished work from scratches, blemishes, stains, or other imperfections until turn-over of building to the Owner.

PART 2: PRODUCT

2.01 Materials

a. Plaster of Paris - First class grade.

b. Burlap - for reinforcement

c. Titanized Steel - for all screws, bolts and other anchoring device

d. Clean Potable Water - for all water mix.

PART 3: EXECUTION

3.01 Workmanship

a. Plaster of Paris precast panels shall have burlap reinforcements with a minimum thickness of 12 millimeter (1/2 inch) for the precast panels.

b. All necessary anchoring and fitting devices shall be provided.

DIVISION 04 000 MASONRY

PART 1 GENERAL

1.01 Division 01 applies to this Division.

1.02 Scope

a. Includes:

1. Provide labor , materials and equipment necessary for completion of work unless indicated or noted otherwise.

SECTION 04 100 MORTAR-CEMENT PLASTER FINISH

PART 1: GENERAL

1.01 Scope

a. Work Included :

1. All labor, materials, equipment, plant and other facilities and the satisfactory performance of all work necessary to complete all cement and masonry work shown on the drawings and specified herein.
2. Refer to the General Conditions accompanying these specifications.

PART 2: PRODUCTS

2.01 Materials

a. Sand : ASTM C35-27

b. Portland Cement : ASTM C150-67, Type I.

c. Water shall be clean and free from deleterious substances.

2.02 Mixes

a. Cement Mortar

1 part	- Portland Cement
2 parts	- Sand
but not more than:	
1 part	- Portland Cement
3 parts	- Sand

PART 3: EXECUTION

3.01 Installation

a. Applications of Cement Plaster

1. Scratch Coat: Apply with sufficient force and material to form full keys or bond. Cross scratch as soon as scratch coat has attained initial set and apply brown coat as soon as possible.
2. Brown Coat: Scratch or brown for bond of finish coat and allow to set hard. Keep brown coat moist until finish coat is applied.
3. Finish Coat: Bring to true, even surfaces with roads, debris, and trowel smooth, leaving finished surface free from tool marks and blemishes. Keep cement plaster moist for at least 3 days and protect against rapid drying until cured.

SECTION 04 200 UNIT MASONRY

PART 1 GENERAL

1.01 Scope

a. Furnish materials and equipment and perform labor required to complete: brick masonry and concrete unit masonry

b. See drawings for sizes, details and location of work required.

1.02 Handling and Storage

a. Handle in a manner to prevent undue chipping and breakage.

b. Protect storage piles, stacks or bins from heavy traffic.

c. Provide platforms to protect bottom piles from contact with soil.

PART 2: PRODUCTS

2.01 Materials

a. Concrete Hollow Blocks - 100 mm x 200 mm x 400 mm and 150 mm x 200 mm x 400 mm and 200 mm x 200 mm x 800 mm.

b. Ceramic Hollow Blocks - 100 mm x 150 mm x 300 mm and 150 mm x 150 mm x 300 mm.

c. Mortar - 1 part Portland Cement, 3 parts sand

d. Wire ties - 16 gauge looped at both ends

e. Bars and Rods - ASTM Standards for masonry reinforcement and minimum diameter of 10 millimeters (3/8 inch).

PART 3: EXECUTION

3.01 Erection

a. Lay all masonry units plumb, true to line, level and with accurately spaced courses.

b. Bond shall be kept plumb throughout. Corners and reveals shall be plumb and true.

c. Built-in anchors, wall plugs, and accessories to masonry as erection progresses.

d. Each course shall be solidly bedded in Portland Cement mortar. All must be damp when laid.

e. Units terminating against beam or slab soffits shall be wedged tight with mortar and reinforcement properly secured to dowels.

f. Reinforcement shall be as shown in drawings. Minimum reinforcement is 12.5 millimeters (1/2 inch) round horizontal bars at every 3 courses and 12.5 millimeters (1/2 inch) round vertical bars at every 2 blocks.

3.02 Unfinished Work

a. Unfinished work shall be stepped back for joining with new works.

b. Before new work is started all loose mortar shall be removed and the exposed joint thoroughly wetted not less than one hour before laying new work.

3.03 Plastering

a. Grout wall to be plastered generously and let dry.

b. Apply scratch coat same as specified under Section 09 300 - 3.01 or Section 04 100.

c. Final plaster finish shall be 1 part Portland Cement and 2 parts sand. Plaster shall conceal all joints and even-out wall surface to a uniform smooth finish using Manila paper or rubber sponge.

3.04 Cleaning

a. Wash finish wall with a solution of 10 percent by volume of muriatic acid applied with stiff fiber brushes.

3.05 Openings

a. Provide beam blocks over or above openings not exceeding 1.20 meters span with same height and width as unit masonry blocks exceeding at least two masonry block lengths beyond the edge of the opening into the wall.

b. Provide 2 - 4 longitudinal reinforcing bars (12.5 millimeters diameter) each at top and bottom of beam blocks with ties at 25 centimeters (10 inches on center).

c. For openings over 1.20 meters (4 feet) in span; refer to drawing of cast-in-place design of lintel beam.

DIVISION 05 000 METALS

PART 1: GENERAL

1.01 Division 01 applies to this Division.

1.02 Submit shop drawings as required by the General Conditions.

1.03 Scope

a. Includes:

1. Provide labor, materials, and equipment necessary for completion of work unless indicated or noted otherwise.

SECTION 05 100 STRUCTURAL METAL FRAMING

PART 1: GENERAL

1.01 Division 05 General applies to this Section

PART 2: PRODUCTS

2.01 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," 1969 7th Edition.

2.02 All structural steel shapes shall be ASTM A-36 structural steel unless otherwise indicated.

2.03 Use E 70 XX electrodes for all members jointed.

2.04 All bolts used unless otherwise specified shall be ASTM A-307 bolts.

2.05 Primer shall be rust inhibiting metal primer.

PART 3: EXECUTION

3.01 Structural steel except where encased in concrete shall be thoroughly cleaned and given one prime coat of materials specified above, well-worked into metal joints and open spaces. Machine finished surfaces shall be protected against corrosion. Clean welds, grind serious abrasions, and apply field prime touch up.

3.02 Erection shall be in accordance to best practice, and includes setting, aligning, and bracing required.

SECTION 05 103 STEEL TRUSSES

PART 1: GENERAL

1.01 Scope

a. Includes:

1. Furnishing and installing steel trusses complete with purlins, sag bolts, and accessories.
2. Section 05 100 Structural Metal Framing is a part of this section.

PART 2: PRODUCTS

2.01 Chord, web member, gusset plates, purlins, sag bolts, etc., as detailed in drawings.

PART 3: EXECUTION

3.01 Fabrication, including splices and structural connections, shall conform to AISC Structural Steel Detailing.

3.02 Provide camber when indicated in drawings.

SECTION 05 160 FRAMING SYSTEMS

PART 1: GENERAL

1.01 Scope

a. Includes:

1. Furnishing and installing steel trusses complete with purlins, sag bolts, and accessories.
2. Section 05 100 Structural Metal Framing is a part of this Section

PART 2: PRODUCTS

2.01 Chord, web members, gusset plates, purlins, sag bolts, etc., as detailed in drawings.

PART 3: EXECUTION

3.01 Fabrication, including splices and structural connections, shall conform to AISC Structural Steel Detailing

3.02 Provide camber when indicated on drawings.

SECTION 05 104 BOLTS AND STEEL EMBEDDED IN CONCRETE

PART 1: GENERAL

1.01 Scope

a. Includes:

1. Anchors, plates, channels, angles, bolts, etc.

PART 2: PRODUCTS

2.01 As specified in Section 05 100 General.

PART 3: EXECUTION

3.01 Fabricate and install according to approved details and connected.

SECTION 05 500 METAL FABRICATIONS

PART 1: GENERAL

1.01 Scope

a. Furnish materials and equipment and perform labor required to complete: metal stair and railing; brass nosing; brass grating; steel grating; steel railing and sleeves

b. See drawings for size, details, and location of work required.

1.02 Sample

a. Submit sample of sections of metal stairs and brass grating in accordance with Article 10.02: "Samples of Materials" of the UAP General Conditions.

PART 2: PRODUCTS

2.01 Materials

a. Structural steel shall conform to ASTM Designation A7.

b. Brass nosing and grating - as approved by the Architect.

c. Standard, black steel pipe ASTM A120-66 for steel railing and sleeves.

PART 3: EXECUTION

3.01 Metal Stair

a. Stair stringers shall be either channels, flat plates or formed plates bent or rolled to sizes and shapes shown.

b. Tread riser brackets shall be 32 mm x 28.5 mm (1 1/4 x 1-1/8 inch) angle welded to stringers.

c. Form sub-treads and risers of not less than No. 14 gauge steel.

3.02 Brass Nosing

a. Provide brass nosing on all stair treads.

3.03 Brass Grating and Steel Grating

a. Provide brass grating and steel grating as shown in the drawings.

3.04 Steel Railing and Sleeves

a. Install connectors in accord with manufacturer's instruction and recommendations. Railings shall be smooth, with all projections and corners ground smooth.

b. Welds shall be flash.

c. Members shall be neatly coped and continuously welded or mechanically expanded at all junctions.

d. Top rails shall run continuously over posts.

e. All welding shall be done neatly and substantially with fillets dressed to uniform radius, with all excess metal removed and weld ground smooth.

f. All posts shall be plumb with 3 millimeter (1/8 inch) of vertical. Longitudinal members shall be parallel with each other and with floor surfaces or slope of stairs to within 3 millimeters per 3 running meter (1/8 inch per 10 running feet). Center lines of all members within each run of railing shall lie in the same vertical plane.

DIVISION 06 000 WOOD AND PLASTICS

PART 1: GENERAL

1.01 Division 01 applies to this Division.

1.02 Lumber and plywood shall be protected and kept under cover both in transit and at jobsite.

1.03 Materials shall not be delivered unduly long before it is required.

1.04 Store on level racks and keep free of ground to avoid warping. Stock to ensure proper ventilation and drainage.

1.05 Members or parts shall be framed, anchored, tied and braced to develop strength and rigidity necessary for purposes for which they are used.

1.06 Preparation, fabrication, and installation of wood members, glues and mechanical devices for fastening thereof shall conform to good engineering practices.

SECTION 06 050 FASTENERS AND SUPPORTS

PART 1: GENERAL

1.01 Scope

a. Includes:

1. Connectors
2. Rough hardware not specified elsewhere

b. Related Work Specified Elsewhere

1. Bolts embedded in concrete or masonry

PART 2: PRODUCTS

2.01 Bolts, wood screws, steel joist hangers, expansion bolts shall be of standard type and make for job requirements.

PART 3: EXECUTION

3.01 Install as instructed or as necessary.

SECTION 06 100 ROUGH CARPENTRY

PART 1: GENERAL

1.01 Scope

a. Furnish materials and equipment and perform labor required to complete: framings, sheathings and related rough carpentry work as indicated on the drawings and/or specified herein.

b. Include in the work, plates, straps, joints, hangers, rods, dowels, rough hardwares, fasteners and other miscellaneous iron and steel items pertinent to rough carpentry work.

c. See drawings and details for location of framing, sheathing and related rough carpentry work required.

1.02 Storage and Protection

a. Stack framing lumber and plywood to ensure against deformation and maintain proper ventilation.

b. Protect lumber and plywood from elements.

c. Lumber in contact with concrete or masonry shall be coated with asphalt or any approved preservative.

PART 2: PRODUCTS

2.01 Lumber

a. Moisture Content - Not to exceed 20 percent.

b. Grade and trademark - Required on each piece of lumber.

c. Quality - Lumber must be sound, thoroughly seasoned well cut and free from warp.

d. Preservative and Pressure Treatment - All lumber shall be pressure impregnated with waterborne preservatives like wolman salt, boliden salt and tanalith H.R.. Surface cut after treatment shall be brush coated with same preservative.

2.02 Plywood: Unless otherwise specified or indicated in drawings, use the following:

a. For exterior exposed plywood: use 12.5 millimeters (1/2 inch) thick waterproof plywood.

b. For interior plywood: use 6 millimeters (1/4 inch) thick and 12.5 millimeter (1/2 inch) thick as shown in drawings.

c. Pressure treatment: all plywood shall be pressure treated.

2.03 Rough Hardware and Metal Fasteners

a. Plates, straps, nails, spikes, screws, bolts, joists, hangers, rods, dowels, fasteners, and miscellaneous iron and steel items shall be of sizes and types to rigidly secure members in place.

PART 3: EXECUTION

3.01 Installation

a. Framing shall be cut square on bearings, closely fitted accurately set to required lines and levels and rigidly secured in place. Plane and dress side of frames that will receive wallboards of sidings.

b. Wood furring and nailers shall be in accordance with detail drawings. Where not indicated on the drawings or mentioned herein, furring strips shall be 2.5 centimeters x 5.0 centimeters (1" x 2") spaced at 40 centimeters (16 inches) on centers bothways. Fasten wood furring securely by expansion bolts or other approved device at every 60 centimeter (2 ft.) on centers. Wood plugs shall not be used.

3.02 Schedules

a. Treated Apitong Lumber shall be used for:

1. Vertical and horizontal studdings of wood partitions.
2. Ceiling nailers and ceiling joists.
3. Trusses and purlins.
4. Other related rough lumber works.

b. Well-seasoned yakal shall be used for all plates, plugs, and other portions of the work directly in contact with concrete or masonry.
Treated apitong may, however be used for framing in contact with concrete and masonry only on the following:

1. Framing of plywood finishing over masonry wall located in the second floor and other upper floors.
2. Framing of ceiling finishes and eaves in the second floor and other upper floors.

c. Treated plywood shall be used for:

1. All acoustic plywood backing
2. Exposed wood ceiling

SECTION 06 200 FINISH CARPENTRY

PART 1: GENERAL

1.01 Scope

a. Furnish materials and equipment and perform labor required to complete

running and standing trim mouldings
wood stairs and handrails
lumber and solid wood panel work
wood door frames and casings
plywoods and hardboards
veneer
built-in cabinetry and countertops
wood baseboards and woodbands

and related finish carpentry work as indicated in the drawings and/or specified herein.

b. See drawings and details for location and quantity of finish carpentry work required.

1.02 Storage and Protection

a. Protect millwork against dampness during and after delivery.

b. Do not bring in interior finish, including doors, into building until plaster is thoroughly dry.

1.03 Measurements and Coordination

a. Check and verify measurements at site prior to fabrication.

b. Coordinate work with all other related trades.

1.04 Samples

a. Submit samples of trim, mouldings, handrails, door frames, solid wood panel work in accordance with Article 10.02 "Samples of Materials" of the UAP General Conditions.

PART 2: PRODUCTS

2.01 Lumber

a. Kiln dried quarter sawn containing not more than 14% moisture, free from imperfections impairing its strength and finish.

b. Trademark is required on each piece of lumber.

2.02 Plywood

a. For interior plywood, use Class A plywood the specie and thickness shall conform to Schedule and Drawings.

PART 3: EXECUTION

3.01 Workmanship

a. All wood finish, millwork and built-in cabinet work shall be true to details, clean and sharply defined.

b. Panels must be set to allow for free movement in case of swelling and shrinkage.

c. Means of fastening various parts together shall be concealed.

3.02 Finish

a. Mill, fabricate and erect interior finish as indicated on the drawings. Machine-sand at the mill and handsand smooth at the job site.

b. Interior trim set against concrete, masonry or wood shall be separated with 6 millimeters (1/4 inch) stone cut joints.

c. Intersecting plywood veneers or plywood panels shall be finished with a corner trim of wood with same specie and finish as the plywood.

d. Make joints tight and in a manner to conceal shrinkage. Secure trim with fine finishing nails, screws, or glue where required.

e. Set nails for putty stopping.

f. Window and door trim shall be single length.

g. Miter mouldings at corners, cope at angles.

3.03 Wood Door Jambs and Heads

a. Set door frames plumb and level and brace until built-in.

b. Anchor wood frames to masonry with approved metal anchors on each side of the jamb. Place top and bottom anchors 20 centimeters (8 inches) from head and floor.

3.04 Wood Shelving

a. Each shelf shall be supported on a continuous wood cleat at walls.

b. Secure cleats to masonry walls by expansion bolt or approved fastening device.

3.05 Built-In Cabinets and Countertops (Mill Made)

a. Fabricate counters and cabinets in accordance with details.

b. Only sound kiln-dried lumber or plywood shall be used.

c. Erect cabinet straight, level and plumb and securely anchor in place. Scribe and closely fit cabinets to adjacent work. Provide necessary grounds and anchors for securing cabinet work in place.

3.06 Fixed Glass on Wood Frames

a. Where fixed glass is set on wood frames thoroughly prime rabbets and wood stops. Fit stops and secure in place loosely with chrome oval-head screws.

3.07 Hardware Installation

a. Accurately fit and install all finished hardware items required.

b. If surface-applied hardware is fitted and applied before painting, remove all such items, except butts, and re-install after painting is completed.

3.08 Schedules

a. Kiln-dried Tanguile Lumber shall be used for:

1. Exposed woodwork at ceiling including wood slats
2. Other finish carpentry work as shown on the drawings, unless indicated or specified otherwise.

b. Kiln-dried Narra Lumber shall be used for:

1. Cabinets and shelving
2. Solid wood stair treads
3. Stair handrails
4. Solid wood panelling
5. Solid wood mouldings and trim

c. Well-seasoned Guijo Lumber shall be used for:

1. Door jambs and heads
2. Window jambs, heads and sills

SECTION 06 400 ARCHITECTURAL WOODWORK

PART 1: GENERAL

1.01 Scope

a. Furnish materials and equipment and perform labor required to complete:

cabinetry using veneers;
finishes and joinery associated with fine
furniture;
panel work joined and finished in same manner as fine furniture

b. See drawings and details for location and quantity of custom woodwork required.

1.02 Qualification

a. Manufacture of custom woodwork shall be approved by the Architect. Refer to Article 10 of UAP General Conditions.

1.03 Samples

a. Submit sample panels in accordance with Article 10.02 "Samples of Materials" of the UAP General Conditions.

1.04 Protection

a. Protect cabinetry and panel work by temporarily covering with heavy building paper or other means to protect from damage until completion of building.

1.05 Measurements and Coordination

a. Check and verify measurements at site prior to fabrication.

b. Coordinate work with all other trades.

PART 2: PRODUCTS

2.01 Solid Wood

a. Kiln dried narra quarter sawn containing not more than 14% moisture free from imperfections impairing its strength and finish.

b. Trade mark is required on each piece of lumber.