

**LOCATION:** M. H. del Pilar Street, Polillo, Quezon  
**PROJECT OWNER:** Mrs. Necerina T. Azagra

### **GENERAL CONDITION**

All construction finish shall be with high quality workmanship to the best of workers talent and skills and with accordance to the Plans and Specifications, as well as to the great satisfaction of the Architect/Engineer and the Owner.

The construction shall conform to all the requirements of the National Building Code, as well as the local rules and the regulation of the municipality of

### **CLEARING OF SITE**

The building site shall level according to the plans and cleared of rubbish, roots and other perishable and objectionable matters to a suitable sub-grade.

All such unsuitable materials shall be removed from the building site and spread uniformly over the areas adjacent to the proposed building, or otherwise disposed of as may be directed by the architect of engineer charge of the construction.

### **STAKING OUT THE BUILDING LINES**

The buildings shall be staked out and all the lines and grade shown in the drawings established before any excavation is started. Batter boards and reference marks shall be erected at such place where they will not be disturbed during the excavation.

### **EXCAVATION AND FILLING**

All filling shall be placed on layers not exceeding four (4) inches in thickness each layer being thoroughly compacted and wetted.

No footings shall rest on fill and the soil bearing capacity shall not be less than 3000 psf.

After forms have been removed from the footings and piers, the materials from excavation shall be used for back filling around. The filling shall make in layers not exceeding 4th thick, each layer thoroughly tamped.

### **CONCRETE WORKS**

#### **A. Scope of Works**

This includes all labor, materials, equipment, and incidents necessary for the construction of all concrete works including reinforcing steels, forms, water

stops and miscellaneous related items such as walls, shelves, anchor bolts and embedded items.

## **B. General Provisions**

Minimum concrete strength  $f_c$  is 3000 psi

Concrete shall be site mixed or transit mixed as produced by plant acceptable to the Project Engineer.

When a smaller mixer is used, concrete laced under such conditions shall be mixed for not less than 1 1/2 minutes after all the materials are in the mixer drum.

All testing shall comply with the latest applicable ASTM Test Method (ASTM Standard). Samples of aggregate and concrete as placed will be subjected in the works shall conform to the approved samples.

## **C. Materials**

Cement shall be Portland cement of a brand approved by the Project Engineer and conforming to ASTM C150, Type 1 or Type 11.

Aggregates

Fine Aggregates shall be washed with natural sand conforming to ASTM Standard and shall range in size within the following limits of US Standard Sieve sizes.

Sieve Designation	Percentage (%) Passing
No. 4	95-100
No. 8	80-100
No. 16	45-70

Coarse Aggregate shall be well-graded, crushed stone or washed gravel conforming to ASTM Standard having the maximum size:

25 mm for plain concrete

20 mm for reinforced concrete sections

19 mm for concrete piles

Maximum Silt Content 1%

Water shall be potable, clean, and free from deleterious amounts of acid, alkalis, oils, or organic matter. Seawater must not be used.

## **D. Proportioning of Concrete**

Well in advance of placing any concrete, the Contractor shall discuss with the Project Engineer the source of materials and concrete mixture proposes to use. Representative samples of aggregate and cement and their test results shall be furnished to the Project Engineer. The contractor prior to pouring of concrete should represent a pouring permit signed by the Project Engineer.

The Contractor shall allow ample time to develop a proposed design mix within the limits of this specification whenever the opinion of the Engineer, it becomes necessary or desirable.

For the following proportions of concrete mixtures shall be use for the various parts of the building:

Column Footing	Class A (1:2:4)
Wall Footing	Class A (1:2:4)
Column	Class A (1:2:4)
Beams	Class A (1:2:4)
Slabs	Class B (1:2:5)

The temperature of the concrete at the time of placement shall normally be 30 degrees centigrade. The contractor will be responsible for employing whatever measures are necessary to comply with these temperature requirements.

#### Form Works

The Contractor shall design, furnish and stall form works and supports required to continue the concrete and shape it to the line shown as the drawings. Form design shall conform to ACI 347. Form shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete and shall be sufficiently tight to prevent loss of mortar from the concrete.

Forms shall be made from roughness and imperfections.

#### Placing of Concrete

No concrete shall be placed until the forms, reinforcement steel, pipes, conduits, sleeves, anchors and other embedded items have been inspected and approve by the Project Engineer.

Pipes, conduits, dowels and other ferrous items requires to be embedded in concrete construction shall be position and supported prior to placement of concrete such that there will be a minimum of 50 mm clearance between said items in position in writing or welding them to reinforcement will not be permitted.

Before depositing any concrete, all debris, dirt and water shall be removed from the forms. The surface of previously placed concrete, such as horizontal and vertical construction joints, shall be roughened, cleaned of foreign

matters and laitance to expose a fresh face and saturated with water at least two hours before, and shortly before the new concrete is placed. Immediately before the new concrete is placed, all hardened surface shall receive through coating of next cement slurry mixed to consistency of very thick paste at least 5mm thick, which shall first be well scrubbed in by means of stiff bristle brushes. The new concrete then shall be placed before the next cement set up.

### **Curing and Protection**

It is latest of that Specification to obtain properly cured concrete. The basic requirement of proper curing is to maintain continuous moist surface from the time of placing of concrete until the end of the curing period. The use of curing compounds may be acceptable but shall require prior approval in writing by the Project Engineer.

All exposed surface including finished surface shall be treated immediately after concrete has been poured, to provide continuous moist curing for at least 7 days. Walls and vertical surfaces may be covered by continuously saturated burlap or kept moist by other approved items.

Formed surfaces shall thoroughly sock with water at least twice a day until the forms are removed.

### **Removal of Forms**

The contractor shall not remove any forms at least 24 hours or until the concrete has attained a strength at least 30 percent of the ultimate strength. Forms for beams and slabs shall not be stripped for at least 150 day degrees and supports shall not be removed until the concrete has attained at least 60 percent of the specified 28-day strength and is capable of supporting its own weight. Construction live loads shall not be place until concrete has attained its specified 29-day strength 3000 psi (20.68 Pa).

Forms shall be stripped such that they will not damage the concrete.

## **CONCRETE REINFORCEMENT**

### Scope of Work

This includes the furnishing, fabrication and installation, of all steel bars and steel tie wires, clips, supports, chairs and spaces required for the reinforcement of concrete as shown on the drawings and specifications.

### Standard Specification

All reinforcing steel bars shall be 4000 psi intermediate grade unless otherwise specified.

The following standards are required to:

ASTM A-82 cold drawn steel wire fabric for concrete reinforcement  
ASTM A-497 welded deformed steel wire fabric for concrete reinforcement  
ASTM A-615 deformed billet steel bars for concrete reinforcement  
ASTM A-315 manual of standard practice for detailing Reinforce concrete structures

Substitution

The following reinforcing steel bars be used for reinforced concrete design:

Nominal dia. (mm)	Approx. Cross Section Area (mm <sup>2</sup> )	Approx. Unit Wt. (kg/m)
# 10	78	0.616
# 12	113	0.888
# 16	201	1.579
# 20	314	2.466

## Materials

Reinforcement steel shall be deformed, new billet steel bars conforming to ASTM A 615, grade 40 for 10 mm to 16 mm diameter bars. Substantially free from mill, scale, rust, grease or other foreign matter.

Reinforcement steel bar or mill identification symbol, and shall be tagged with the size and marked numbers so that different types may be identified and shall be stored off the ground to protect the steel from moisture and dirt, until placed in final position.

Steel wire for tying reinforcing bars and water stops shall conform to as ASTM A 82.

Welded wire fabric for concrete reinforcement shall conform to ASTM A 497.

## Fabrication and Reinforcement

Reinforcement steel shall be accurately formed to the dimensions shown on the shop drawings and bar schedules. Reinforcement steel shall not be straightened or bent. Bars with kinks or bends not shown in the drawings will not be accepted.

## Installation of Reinforcement

Reinforcement bars shall be accurately placed as shown in the drawings, and in accordance with the shop drawings and schedules. The reinforcing bars shall be secured against displacement with annealed iron wire ties of minimum 1.5 mm diameter or suitable clips at the intersection.

Except as otherwise indicated on the drawings, reinforcement steel shall be installed with a clearance for the concrete cover as follows:

2.1 Concrete placed directly on earth	75 mm
2.2 Formed surface in contact with the Soil, water or exposed to weather	50 mm
Concrete cover of main reinforcement for columns and beams	40 mm

No other reinforcing bars shall be welded.

## **MASONRY**

This includes the furnishing of all labors, materials, equipment required to construct all masonry unit walls as shown in the drawings and specifications. All materials for the work of this section shall be delivered, stored and handled so as to preclude damage of any nature.

### **Materials**

Portland cement shall conform to ASTM Specification C 150, Type L.

Sand shall be clean, durable particles, free from injurious amount of organic matter. The sand shall conform to ASTM Specification C 144 or C 33 as required.

Water shall be free from injurious amounts of oil, acids, alkalis, and organic matter and shall be clean and fresh.

Concrete blocks shall conform to ASTM C 90, Grade N, and/or to the Philippine Bureau of Standards SAD No. 15-2.

Concrete Hollow blocks to be used shall be six inches (6) thick for exterior walls and four inches (4) thick for interior walls.

### **Mortar Mixes**

Masonry mortar for setting blocks shall be in the proportion of one part cement to three parts sand or as otherwise approved by the Project Engineer.

Mortar shall be mixed with water in an amount compatible with workability.

Mixing shall be done immediately before usage.

### **Execution**

All masonry shall be laid plumb and true to lives and built to the thickness and band required with courses level and joints and bond uniform. Masonry shall be carried up in a uniform manner.

Concrete blocks shall be laid in running band, unless otherwise indicated with joints not exceeding 10 mm and uniform throughout and finished slightly concave and smooth. All blocks shall lay in full bed of mortar applied to shell and webs.

Saws shall neatly do all necessary block cutting.

Control joints shall be installed at the locations noted and detailed on the drawings.

### **Lintels, Ties and Miscellaneous Items**

The contractor shall build in all miscellaneous items specified in other sections to be set in masonry including frames, lintels, reinforcing steel, electrical boxes and furniture, sleeves, grilles, anchors and other miscellaneous items. All anchorage, attachments, and bonding devices shall be set so as to prevent slippage and shall be completely with mortar.

### **Grouting**

Grout and cement mortar for setting structural columns, railings, frames in walls and where otherwise required shall be done with mortar with one part cement to one part sand. Before placing grout, thoroughly clean all surface. Grout shall be tamped into place with blunt tool to fill entire void.

### **CARPENTRY**

Furnish materials and equipment and labor required to complete wooden framings and related rough carpentry work as indicated in the drawings.

Lumbers shall be of approved of the respective kinds required for the various parts of the work, well seasoned, thoroughly dry, straight and free from large loose or unsound knob, sap shakes or other imperfections imparting its strength, durability and appearance.

Framing lumber shall be rough dimensions shown in drawings. All exposed woodworks shall be smoothly dressed and well sand papered. Moisture content shall not exceed 18 percent unless otherwise specified. All lumber, excluding scaffoldings, are to be pressure treated, conforming to 67 percent stress grade lumber in accordance to the requirements of the Philippine National Building Code, latest edition.

Fastening shall be common nails, glue as specified flat head wood screws, round head wood screws, bolts or lag screws where specifically called for.

## **Doors**

All lumbers for doors including jambs, cabinet and closet doors and all wood work of similar nature shall kiln-dried with not more than 14% moisture cement.

All doors must be guaranteed against warping, twisting or cracking. The Contractor is obliged to replace entirely any and all each defective door.

## **Built-in Cabinets and Closets**

Fabricated Cabinets and closets in accordance with details as shown on plans.

Use sound kiln-dried lumber and plywood.

Erect cabinets' straight, level and plumb and securely anchor in place.

## **FABRICATED ITEMS**

All windows unless otherwise specified and indicated on plans shall be 1/4" thick colored white glass on (powder coated) aluminum frame.

Main door shall be panel door on 2x5 solid wood k.d. Door jambs.

## **HARDWARE**

3X3 loose pin hinges, all bronze finished shall be used for all door. Provide three hinges on each door.

Concealed hinges shall be used for kitchen, cabinet and closet.

All cabinet doors shall be provided with catches: cabinets with pullers and hook.

## **ROOFING**

The Contractor shall provide all items, articles materials operation, or method listed, mentioned all schedules on the Drawings and/or herein, including all labor, materials, equipment and incidental necessary as required for their completion.

## **Materials**

Roofing shall be pre-painted GA 26, G.I. sheet approved by the Architect.

Roofing accessories shall be made of material as per installation procedures specified by the manufacturer.

Other design and form of metal shall conform to the above mentioned following the detail as shown in the drawing,



## **Installation**

1. G.I. roofing shall be securely laid on by 38mm 5.5,mm x 3/16 thick angle bar top and bottom chord and 25 mm x 5.5 mm x 3/16 thick angle bar web member with 25 mm x 5.5 mm x 3/16 thick angle bar lipped channel purlins.
2. Care should be exercise in the proper anchorage of all roofing frames.
3. Installation of roofing including valleys, hips, ridge and flashing shall be as per manufacturers' installation procedures.

## **FINISHINGS**

### **Flooring**

Use 12 x 12 unglazed floor tiles finish for the classroom.  
Use No. 10 white pebble washout for the corridor.

### **Walls**

All interior and exterior walls unless otherwise specified on the plans shall be paint finish.

### **Water Proofing**

Horizontal and vertical concrete and masonry substrate surface should be steel trowelled to smooth finish, cured dry and free from rubbish, loose or foreign material. Surfaces should be properly grade to drain water freely into drain lines, gutters and downspouts. Drainage connections and weep holes should be set up to permit the free flow of water. Reglets of about 2 inches deep x 2 inches wide at 1 foot above the floor finish must be provided along walls or parapet walls for the termination of water proofing system (flashing).

## **ELECTRICAL**

### **General Condition**

All electrical works/installation herein shall be under the provision of the latest edition of the Philippine Electrical Code, the rule and regulation shall comply with the requirements of the local utility company.  
Electrical Drawing shall be coordinated with the existing utilities as a cross-reference in case of any inconsistency.

Electrical installation shall be concealed from view, wiring shall be encased and power service entrance, telephone, and cable service entrance shall be rigid steel conduit (R.S.C), unless otherwise specified.

All materials to be used should be new and approved quality.

The contractor shall verify and orient the actual location of service entrance for the connection of the power supply.

The minimum wire and conduit size shall be 3.5 mm and 1.5 mm diameter trade size respectively, unless otherwise specified.

Panel boxes or pull boxes of appropriate size shall be provided to accommodate the number of splices of wire or shall be dead safety front type equipped with thermal magnetic molded case circuit breaker of the trip type.

All electrical works herein shall be done under the direct and immediate supervision of duly license Electrical Engineer or Master Electrician.

## **Materials**

Rigid steel conduit shall be hot-dipped galvanized mild steel pipe and shall be 3m lengths including coupling.

Feeder and branch circuit wires and cables shall be type TW or THW as required by the Drawings.

PVC electrical conduit shall be NELTEX, supplied in standard effective length of 3m and conforming to PNS/ISO 3126.

Outlet boxes shall be hot-dipped galvanized or cast metals as required. Thickness of pressed steep boxes shall be less than gauge #16.

Circuit Breakers for panel boards shall be mold case circuit breaker with quick mode, quick break, and trip free mechanisms. They shall meet US Federal Specification and NEMA Standards.

Panel board shall be as manufactured by Westinghouse or approved equal.

Fluorescent fixtures shall be equipped with HPF rapid start, thermal protected ballast, spring- loaded lamp holder and standard white lamp.

Fixtures housing shall be baked enamel, white interior, gauge 22 minimum galvanized steel unless otherwise noted. Lighting fixtures shall be compact fluorescent lamp with 18-50 watts, 60 Hz, 220 V; convenience outlet shall be duplex, universal type 10A, 2-POLE, 2-WIRE, 220 V.

## **Installation**

Metallic conduits and raceway system shall be grounded in accordance with the drawings and the requirements of the Philippine Electrical Code with standard grouping practices.

Feeders, distribution voltage shall be 230 V, 3 phases, 3 wire Feeder conductors and conduits shall be installed as shown in the drawings and no change in size shall be made without consent of the owner. Feeder conductors shall be continuous and without splices between terminals.

Branch circuit, no wire smaller than 2mm<sup>2</sup> (No. 14 AWG) shall be used for any lighting and power circuits.

Panel boards shall be mounted with their centers at 1.4 m above the floor unless otherwise indicated by field conditions.

## **Testing**

### **Ground Test.**

The entire installation shall free from improper ground and from short circuits, each panel shall be tested with means connected. Lamps removed or omitted from the sockets and all switches closed. Individual power equipment shall be connected for proper and intended operation. In no case shall the resistance be less than that allowed by the regulation for electrical equipment of the building. Failures shall be corrected in any manner satisfactory to the Architect and Engineer.

### **Performance Test.**

The Electrical Contractor shall test all systems of entire electrical installation for proper operational conditions. These conditions shall apply the power and lighting installation, voltage drop, and grounding effects.

## **MISCELLANEOUS METAL**

### **Welding**

Welding shall be in accordance with standard code of arc and gas welding in building construction of the American Welding Society.

### **Anchor and Bolts**

Anchors and Bolts shall be provided where indicated and where necessary for fastening work in place. They shall be embedded in concrete and masonry as the work progresses and shall be space about 2 ft, 10 ft on center unless indicated or otherwise specified. Sizes, kinds, and spacing of anchor not indicated or specified shall be as necessary for their purposes.

### **Wrought Iron grilles**

Wrought iron grilles of size and design indicated shall be provided to suit the given openings and conditions. Grilles shall be factory fabricated form square and flat bars or size indicated. Joints of grilles shall be tensioned and/or welded to frames. Proved countersunk screw holes of appropriate size and spacing to provide for sufficient anchorage and maximum security.

## **PAINTING**

All painting work for this project, except as herein after specified, shall be done with the use of Boysen paint Products manufactured by Boysen Philippines, INC., whose specifications are hereby declared and made part of this Specification, with the same force and effects as if written herein full.

The painting contractor shall supply all labor, paint materials, tools, staging and equipment necessary, and shall perform all painting and finishing works as for this project.

The painting contractor shall store his materials in one place in the building to be kept neat and clean. Any damage thereto, or its surrounding shall be made good care, care being taken storage of paints, oil, etc. to prevent danger of fire. Oily rags shall be kept in metal containers and shall be removed from building everyday upon the stopping of works.

It shall be painting contractors' responsibility to protect his works and those of all other contractor during time his work is underway. He shall be responsible for any kind of damages to the work of property of other caused by his employees or by himself.

Before painting is done, all surfaces shall be cleaned, smoothed and freed from dust, dirt, grease, mortar, rust, and other foreign substances and all paints shall be spread evenly and carefully.

No painting shall be done, on outside work in extremely cold, frosty, foggy or damp weather. Painting to be done in cold weather should be performed when the temperature is above 59 degrees Fahrenheit.

All paints and paint shall be delivered to the building site in unbroken packages, bearing the marks. Manufactured by Boysen Philippines, Inc. under their labels. No adulteration of Boysen Paints with other brands shall be allowed.