1. Site Investigation Reports

The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports referred to in the **SCC**supplemented by any information obtained by the Contractor.

2. The Procuring Entity, Licenses and Permits

The Procuring Entity shall, if requested by the Contractor, assist him in applying for permits, licenses or approvals, which are required for the Works.

3. Contractor's Risk and Warranty Security

3.1. The Contractor shall assume full responsibility for the Works from the time project construction commenced up to final acceptance by the Procuring Entity and shall be held responsible for any damage or destruction of the Works **except those occasioned by *force majeure*.** The Contractor shall be **fully responsible** for the **safety, protection, security**, and convenience of **his personnel, third parties, and the public at large**, as well as the Works, Equipment, installation, and the like to be affected by his construction work.

3.2. The defects liability period for infrastructure projects shall be one year from contract completion up to final acceptance by the Procuring Entity. During this period, the Contractor shall undertake the repair works, at his own expense, of any damage to the Works on account of the use of materials of inferior quality within ninety (90) days from the time the Head of the Procuring Entity has issued an order to undertake repair. In case of failure or refusal to comply with this mandate, the Procuring Entity shall undertake such repair works and shall be entitled to full reimbursement of expenses incurred therein upon demand.

3.3. Unless otherwise indicated in the **SCC**, in case the Contractor fails to comply with the preceding paragraph, the Procuring Entity shall forfeit its performance security, subject its property(ies) to attachment or garnishment proceedings, and perpetually disqualify it from participating in any public bidding. All payables of the GOP in his favor shall be offset to recover the costs.

3.4. After final acceptance of the Works by the Procuring Entity, the Contractor shall be held responsible for "Structural Defects", *i.e.*, major faults/flaws/deficiencies in one or more key structural elements of the project which may lead to structural failure of the completed elements or structure, or "Structural Failures", *i.e.*,where one or more key structural elements in an infrastructure facility fails or collapses, thereby rendering the facility or part thereof incapable of withstanding the design loads, and/or endangering the safety of the users or the general public:

(a) Contractor – Where Structural Defects/Failures arise due to faults attributable to improper construction, use of inferior quality/substandard materials, and any violation of the contract plans and specifications, the contractor shall be held liable;

(b) Consultants – Where Structural Defects/Failures arise due to faulty and/or inadequate design and specifications as well as construction supervision, then the consultant who prepared the design or undertook construction supervision for the project shall be held liable;

(c) Procuring Entity's Representatives/Project Manager/Construction Managers and Supervisors – The project owner's representative(s), project manager, construction manager, and supervisor(s) shall be held liable in cases where the Structural Defects/Failures are due to his/their willful intervention in altering the designs and other specifications; negligence or omission in not approving or acting on proposed changes to noted defects or deficiencies in the design and/or specifications; and the use of substandard construction materials in the project;

(d) Third Parties - Third Parties shall be held liable in cases where Structural Defects/Failures are caused by work undertaken by them such as leaking pipes, diggings or excavations, underground cables and electrical wires, underground tunnel, mining shaft and the like, in which case the applicable warranty to such structure should be levied to third parties for their construction or restoration works.

(e) Users - In cases where Structural Defects/Failures are due to abuse/misuse by the end-user of the constructed facility and/or non–compliance by a user with the technical design limits and/or intended purpose of the same, then the user concerned shall be held liable.

3.5. The warranty against Structural Defects/Failures, except those occasioned on force majeure, shall cover the period specified in the**SCC** reckoned from the date of issuance of the Certificate of Final Acceptance by the Procuring Entity.

3.6. The Contractor shall be required to put up a **warranty security** in the form of **cash, bank guarantee, letter of credit, GSIS or surety bond callable on demand**, in accordance with the following schedule:

Form of Warranty	Minimum Amount in Percentage (%) of Total Contract Price
(a) Cash or letter of credit issued by Universal or Commercial bank: provided, however, that the letter of credit shall be confirmed or authenticated by a Universal or Commercial bank, if issued by a foreign bank	Five Percent (5%)
(b) Bank guarantee confirmed by Universal or Commercial bank: provided, however, that the letter of credit shall be confirmed or authenticated by a Universal or Commercial bank, if issued by a foreign bank	Ten Percent (10%)
(c) Surety bond callable upon demand issued by GSIS or any surety or insurance company duly certified by the Insurance Commission	Thirty Percent (30%)

3.7. The warranty security shall be stated in Philippine Pesos and shall remain effective for one year from the date of issuance of the Certificate of Final Acceptance by the Procuring Entity, and returned only after the lapse of said one year period.

3.8. In case of structural defects/failure occurring during the applicable warranty period provided in **GCC** Clause 12.5, the Procuring Entity shall undertake the necessary restoration or reconstruction works and shall be entitled to full reimbursement by the parties found to be liable for expenses incurred therein upon demand, without prejudice to the filing of appropriate administrative, civil, and/or criminal charges against the responsible persons as well as the forfeiture of the warranty security posted in favor of the Procuring Entity.

4. Liability of the Contractor

Subject to additional provisions, if any, set forth in the **SCC**, the Contractor's liability under this Contract shall be as provided by the laws of the Republic of the Philippines.

5. Procuring Entity's Risk

5.1. From the Start Date until the Certificate of Final Acceptance has been issued, the following are risks of the Procuring Entity:

(a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to:

(i) any type of use or occupation of the Site authorized by the Procuring Entity after the official acceptance of the works; or

(ii) negligence, breach of statutory duty, or interference with any legal right by the Procuring Entity or by any person employed by or contracted to him except the Contractor.

(b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Procuring Entity or in the Procuring Entity's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.

6. Insurance

6.1. The Contractor shall, under his name and at his own expense, obtain and maintain, for the duration of this Contract, the following insurance coverage:

(a) Contractor's All Risk Insurance;

(b) Transportation to the project Site of Equipment, Machinery, and Supplies owned by the Contractor;

(c) Personal injury or death of Contractor's employees; and

(d) Comprehensive insurance for third party liability to Contractor's direct or indirect act or omission causing damage to third persons.

6.2. The **Contractor shall provide evidence to the Procuring Entity's Representative** that **the insurances required under this Contract have been effected** and shall, within a reasonable time, **provide copies of the insurance policies to the Procuring Entity's Representative**. Such evidence and such policies shall be provided to the Procuring Entity's through the Procuring Entity's Representative.

6.3. The Contractor shall notify the insurers of changes in the nature, extent, or program for the execution of the Works and ensure the adequacy of the insurances at all times in accordance with the terms of this Contract and shall produce to the Procuring Entity's Representative the insurance policies in force including the receipts for payment of the current premiums.

The above insurance policies shall be obtained from any reputable insurance company approved by the Procuring Entity's Representative.

6.4. **If the Contractor fails to obtain and keep in force the insurances** referred to herein or any other insurance which he may be required to obtain under the terms of this Contract, **the Procuring Entity may obtain and keep in force any such insurances and pay such premiums** as may be necessary for the purpose. From time to time, **the Procuring Entity may deduct the amount it shall pay for said premiums including twenty five percent (25%) therein from any monies due, or which may become due, to the Contractor**, without prejudice to the Procuring Entity exercising its right to impose other sanctions against the Contractor pursuant to the provisions of this Contract.

6.5. In the event the Contractor fails to observe the above safeguards, **the Procuring** Entity may, at the Contractor's expense, take whatever measure is deemed necessary for its protection and that of the Contractor's personnel and third parties, and/or **order the interruption of dangerous Works**. **In addition, the Procuring Entity may refuse to make the payments under GCC Clause 40** until the Contractor complies with this Clause.

6.6. The Contractor shall immediately replace the insurance policy obtained as required in this Contract, without need of the Procuring Entity's demand, with a new policy issued by a new insurance company acceptable to the Procuring Entity for any of the following grounds:

(a) The issuer of the insurance policy to be replaced has:

(i) become bankrupt;

(ii) been placed under receivership or under a management committee;

(iii) been sued for suspension of payment; or

(iv) been suspended by the Insurance Commission and its license to engage in business or its authority to issue insurance policies cancelled; or

(v) Where reasonable grounds exist that the insurer may not be able, fully and promptly, to fulfill its obligation under the insurance policy.

7. Termination for Default of Contractor

7.1. The Procuring Entity shall terminate this Contract for default when any of the following conditions attend its implementation:

7.2. Due to the Contractor's fault and while the project is ongoing, it has incurred **negative slippage of fifteen percent (15%) or more** in accordance with Presidential Decree 1870, regardless of whether or not previous warnings and notices have been issued for the Contractor to improve his performance;

7.3. Due to its own fault and after this Contract time has expired, the Contractor incurs **delay in the completion of the Work after this Contract has expired**; or

7.4. The Contractor:

(a) abandons the contract Works, refuses or fails to comply with a valid instruction of the Procuring Entity or fails to proceed expeditiously and without delay despite a written notice by the Procuring Entity;

(b) **does not actually have** on the project Site the **minimum essential equipmentlisted on the Bid** necessary to prosecute the Works in accordance with the approved Program of Work and equipment deployment schedule as required for the project;

(c) does not execute the Works in accordance with this Contract or persistently or flagrantly neglects to carry out its obligations under this Contract;

(d) neglects or **refuses to** remove materials or to **perform a new Work that has been rejected as defective or unsuitable**; or

(e) **sub-lets** any part of this Contract **without approval by the Procuring Entity**.

7.5. **All materials** on the Site, Plant, Equipment, and Works **shall be deemed to be the property of the Procuring Entity if this Contract is rescinded** because of the **Contractor's default**.

8. Termination for Default of Procuring Entity

The Contractor may terminate this Contract with the Procuring Entity if the works are completely stopped for a continuous period of at least sixty (60) calendar days through no fault of its own, due to any of the following reasons:

(a) Failure of the Procuring Entity to deliver, within a reasonable time, supplies, materials, right-of-way, or other items it is obligated to furnish under the terms of this Contract; or

(b) The prosecution of the Work is disrupted by the adverse peace and order situation, as certified by the Armed Forces of the Philippines Provincial Commander and approved by the Secretary of National Defense.

9. Termination for Other Causes

9.1. The Procuring Entity may terminate this Contract, in whole or in part, at any time for its convenience. The Head of the Procuring Entity may terminate this Contract for the convenience of the Procuring Entity if he has determined the existence of conditions that make Project Implementation economically, financially or technically impractical and/or unnecessary, such as, but not limited to, fortuitous event(s) or changes in law and National Government policies.

9.2. The **Procuring Entity or the Contractor** may terminate this Contract if the other party **causes a fundamental breach** of this Contract.

9.3. Fundamental breaches of Contract shall include, but shall not be limited to, the following:

(a) The Contractor **stops work for twenty eight (28) days** when no stoppage of work is shown on the current Program of Work and the stoppage has not been authorized by the Procuring Entity's Representative;

(b) The Procuring Entity's Representative **instructs the Contractor** to delay the progress of the Works, and the **instruction is not withdrawn within twenty eight (28) days**;

(c) The Procuring Entity shall terminate this Contract if the **Contractor is declared bankrupt or insolvent** as determined with finality by a **court of competent jurisdiction**. In this event, termination will be **without compensation to the Contractor**, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Procuring Entity and/or the Contractor. In the case of the Contractor's insolvency, any Contractor's Equipment which the Procuring Entity instructs in the notice is to be used until the completion of the Works;

(d) A **payment certified** by the Procuring Entity's Representative is **not paid** by the Procuring Entity **to the Contractor within eighty four (84) days** from the date of the Procuring Entity's Representative's certificate;

(e) The Procuring Entity's Representative **gives No**tice that **failure to correct a particular Defect is a fundamental breach** of Contract and the **Contractor fails to correct** it within a reasonable period of time determined by the Procuring Entity's Representative;

(f) The **Contractor does not maintain a Security**, which is required;

(g) The Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as defined in the **GCC** Clause 9; and

(h) In case it is determined **prima facie** by the Procuring Entity that the Contractor has engaged, before or during the implementation of the contract, in unlawful deeds and behaviors relative to contract acquisition and implementation, such as, but not limited to, the following:

(i) corrupt, fraudulent, collusive, coercive, and obstructive practices as defined in **ITB** Clause 3.1(a), unless otherwise specified in the SCC;

(ii) **drawing up or using forged documents**;

(iii) **using adulterated materials**, means or methods, or engaging in production contrary to rules of science or the trade; and

(iv) any other act analogous to the foregoing.

9.4. The Funding Source or the Procuring Entity, as appropriate, will seek to impose the maximum civil, administrative and/or criminal penalties available under the applicable law on individuals and organizations deemed to be involved with corrupt, fraudulent, or coercive practices.

9.5. When persons from either party to this Contract gives notice of a fundamental breach to the Procuring Entity's Representative in order to terminate the existing contract for a cause other than those listed under **GCC** Clause 18.3, **the Procuring Entity's Representative shall decide whether the breach is fundamental or not**.

9.6. **If this Contract is terminated, the Contractor shall stop work immediately**, make the Site safe and secure, and leave the Site as soon as reasonably possible.

10. Procedures for Termination of Contracts

10.1. The following provisions shall govern the procedures for the termination of this Contract:

(a) Upon receipt of a written report of acts or causes which may constitute ground(s) for termination as aforementioned, or upon its own initiative, the Procuring Entity shall, within a period of seven (7) calendar days, verify the existence of such ground(s) and cause the execution of a Verified Report, with all relevant evidence attached;

(b) Upon recommendation by the Procuring Entity, the Head of the Procuring Entity shall terminate this Contract only by a written notice to the Contractor conveying the termination of this Contract. The notice shall state:

(i) that this Contract is being terminated for any of the ground(s) afore-mentioned, and a statement of the acts that constitute the ground(s) constituting the same;

(ii) the extent of termination, whether in whole or in part;

(iii) an instruction to the Contractor to show cause as to why this Contract should not be terminated; and

(iv) special instructions of the Procuring Entity, if any.

The Notice to Terminate shall be accompanied by a copy of the Verified Report;

(c) Within a period of seven (7) calendar days from receipt of the Notice of Termination, the Contractor shall submit to the Head of the Procuring Entity a verified position paper stating why the contract should not be terminated. If the Contractor fails to show cause after the lapse of the seven (7) day period, either by inaction or by default, the Head of the **Procuring Entity shall issue an order terminating the contract**;

(d) The Procuring Entity may, at anytime before receipt of the Bidder's verified position paper described in item (c) abovewithdraw the Notice to Terminate if it is determined that certain items or works subject of the notice had been completed, delivered, or performed before the Contractor's receipt of the notice;

(e) Within a non-extendible period of ten (10) calendar days from receipt of the verified position paper, the Head of the Procuring Entity shall decide whether or not to terminate this Contract. It shall serve a written notice to the Contractor of its decision and, unless otherwise provided in the said notice, this Contract is deemed terminated from receipt of the Contractor of the notice of decision. The termination shall only be based on the ground(s) stated in the Notice to Terminate; and

(f) The Head of the Procuring Entity may create a Contract Termination Review Committee (CTRC) to assist him in the discharge of this function. All decisions recommended by the CTRC shall be subject to the approval of the Head of the Procuring Entity.

10.2. Pursuant to Section 69(f) of RA 9184 and without prejudice to the imposition of additional administrative sanctions as the internal rules of the agency may provide and/or further criminal prosecution as provided by applicable laws, the procuring entity shall impose on contractors after the termination of the contract **the penalty of suspension for one (1) year for the first offense**, suspension for **two (2) years for the second offense** from participating in the public bidding process, for violations committed **during the contract implementation stage**, which include but not limited to the following:

(a) Failure of the contractor, due solely to his fault or negligence, to mobilize and start work or performance within the specified period in the Notice to Proceed ("NTP");

(b) Failure by the contractor to fully and faithfully comply with its contractual obligations without valid cause, or failure by the contractor to comply with any written lawful instruction of the procuring entity or its representative(s) pursuant to the implementation of the contract. For the procurement of infrastructure projects or consultancy contracts, **lawful instructions** include but are not limited *to* the following:

(i) **Employment of competent technical personnel**, competent **engineers** and/or work **supervisors**;

(ii) Provision of **warning signs and barricades** in accordance with approved plans and specifications and contract provisions;

(iii) **Stockpiling in proper places of all materials** and removal from the project site of waste and excess materials**,** including broken pavement and excavated debris in accordance with approved plans and specifications and contract provisions;

(iv) **Deployment of committed equipment**, facilities, support staff and manpower; and

(v) **Renewal of** the effectivity dates of the **performance security after its expiration** during the course of contract implementation.

(c) Assignment and **subcontracting of the contract** or any part thereof or **substitution of key personnel** named in the proposal **without prior writtenapproval** by the procuring entity.

(d) **Poor performance** by the contractor or **unsatisfactory quality** and/or **progress of work** arising from his fault or negligence as reflected in the Constructor's Performance Evaluation System ("CPES") rating sheet. In the absence of the CPES rating sheet, the existing performance monitoring system of the procuring entity shall be applied. Any of the following acts by the Contractor shall be construed as poor performance:

(i) **Negative slippage of 15% and above** within the critical path of the project due entirely to the fault or negligence of the contractor; and

(ii) Quality of **materials and workmanship not complying** with the approved specifications arising from the contractor's fault or negligence.

(e) Willful or **deliberate abandonment or non-performance** of the project or contract by the contractor resulting to substantial breach thereof without lawful and/or just cause.

In addition to the penalty of suspension, the **performance security** posted by the contractor shall also be **forfeited**.

11. Force Majeure, Release From Performance

11.1. For purposes of this Contract the terms "***force majeure***" and "**fortuitous event**" may be **used interchangeably**. In this regard, a fortuitous event or *force majeure* shall be interpreted to mean an event which the Contractor could not have foreseen, or which though foreseen, was inevitable. It shall **not include ordinary unfavorable weather conditions**; and any **other cause** the effects of **which could have been avoidedwith the exercise of reasonable diligence** by the Contractor.

11.2. If this Contract is discontinued by **an outbreak of war** or by any **other event entirely outside the control** of either the Procuring Entity or the Contractor, the **Procuring Entity's Representative** shall **certify that this Contract has been discontinued**. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and **shall be paid for all works carried out** before receiving it and for any Work carried out afterwards to which a commitment was made.

11.3. **If the event** continues for a period of **eighty four (84) days**, **either party may then give notice of termination**, which shall **take effect twenty eight (28) d**ays after the giving of the notice.

11.4. **After termination**, the Contractor shall be **entitled to payment of the unpaid balance of the value of the Works executed and of the materials** and Plant reasonably **delivered to the Site**, adjusted by the following:

(a) any sum to which the Contractor is entitled under **GCC** Clause 28;

(b) the cost of his suspension and demobilization;

(c) any sum to which the Procuring Entity is entitled.

11.5. The net balance due shall be paid or repaid within a reasonable time period from the time of the notice of termination.

12. Resolution of Disputes

12.1. If any dispute or difference of any kind whatsoever shall arise between the parties in connection with the implementation of the contract covered by the Act and this IRR, the parties shall make every effort to resolve amicably such dispute or difference by mutual consultation.

12.2. If the Contractor believes that a decision taken by the PROCURING ENTITY's Representative was either outside the authority given to the PROCURING ENTITY's Representative by this Contract or that the decision was wrongly taken, the decision shall be referred to **the Arbiter** indicated in the **SCC** within fourteen (14) days of the notification of the PROCURING ENTITY's Representative's decision.

12.3. Any and all disputes arising from the implementation of this Contract covered by the R.A. 9184 and its IRR shall be submitted to arbitration in the Philippines according to the provisions of **Republic Act No. 876, otherwise known as the " Arbitration Law"** and Republic **Act 9285, otherwise known as the "Alternative Dispute Resolution Act of 2004"**: *Provided, however*, That, disputes that are within the competence of the **Construction Industry Arbitration Commission** to resolve shall be referred thereto. The process of arbitration shall be incorporated as a provision in this Contract that will be executed pursuant to the provisions of the Act and its IRR: *Provided, further,* That, by mutual agreement, the parties may agree in writing to resort to other alternative modes of dispute resolution.

13. Suspension of Loan, Credit, Grant, or Appropriation

In the event that the Funding Source suspends the Loan, Credit, Grant, or Appropriation to the Procuring Entity, from which part of the payments to the Contractor are being made:

(a) The Procuring Entity is obligated to notify the Contractor of such suspension within seven (7) days of having received the suspension notice.

(b) If the **Contractor has not received sums due it** for work already done within **forty five (45) days** from the time the Contractor's claim for payment has been certified by the Procuring Entity's Representative, the **Contractor may immediately issue a suspension of work notice** in accordance with **GCC** Clause 45.2.

14. Procuring Entity's Representative's Decisions

14.1. Except where otherwise specifically stated, the Procuring Entity's Representative will decide contractual matters between the Procuring Entity and the Contractor in the role representing the Procuring Entity.

14.2. The Procuring Entity's Representative may delegate any of his duties and responsibilities to other people, except to the Arbiter, after notifying the Contractor, and may cancel any delegation after notifying the Contractor.

15. Approval of Drawings and Temporary Works by the Procuring Entity's Representative

15.1. **All Drawings** prepared by the Contractor for the execution of the **Temporary Works**, are subject to **prior approval** by the Procuring Entity's Representative before its use.

15.2. The Contractor shall be responsible for design of Temporary Works.

15.3. The Procuring Entity's Representative's approval **shall not alter the Contractor's responsibility for design** of the Temporary Works.

15.4. The Contractor shall **obtain approval of third parties** to the design of the Temporary Works, **when required by the Procuring Entity**.

16. Acceleration and Delays Ordered by the Procuring Entity's Representative

16.1. When the Procuring Entity wants the Contractor to finish before the Intended Completion Date, the Procuring Entity's Representative will **obtain priced proposals** for achieving the necessary acceleration from the Contractor. **If the Procuring Entity accepts these proposals**, the **Intended Completion Date will be adjusted** accordingly and confirmed by both the Procuring Entity and the Contractor.

16.2. If the Contractor's Financial Proposals for an acceleration are accepted by the Procuring Entity, they are **incorporated in the Contract Price** and treated as a **Variation**.

17. Extension of the Intended Completion Date

17.1. The Procuring Entity's Representative **shall extend the Intended Completion Date if a Variation is issued** which makes it impossible for the Intended Completion Date to be achieved by the Contractor without taking steps to accelerate the remaining work, which would cause the Contractor to incur additional costs. No payment shall be made for any event which may warrant the extension of the Intended Completion Date.

17.2. The **Procuring Entity's Representative shall decide** whether and by **how much to extend** the Intended Completion Date **within twenty one (21) days of the Contractor asking** the Procuring Entity's Representative for a decision thereto after fully submitting all supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.

18. Right to Vary

18.1. The Procuring Entity's Representative **with the prior approval of the Procuring Entity** may **instruct Variations**, up to a **maximum** cumulative amount of **ten percent (10%) of the original contract cost**.

18.2. Variations shall be valued as follows:

(a) At a lump sum price agreed between the parties;

(b) where appropriate, at rates in this Contract;

(c) in the absence of appropriate rates, the rates in this Contract shall be used as the basis for valuation; or failing which

(d) at appropriate new rates, equal to or lower than **current industry rates** and to be agreed upon by both parties and approved by the Head of the Procuring Entity.

19. Contractor's Right to Claim

If the Contractor incurs cost as a result of any of the events under **GCC**Clause 13, the Contractor shall be entitled to the amount of such cost. If as a result of any of the said events, it is necessary to change the Works, this shall be dealt with as a Variation.**[Refer to Section V, SCC 28 for clarification].**

20. Dayworks

20.1. Subject to **GCC** Clause 43 on Variation Order, and if applicable as indicated in the**SCC**, the Dayworks rates in the Contractor's Bid shall be used for **small additional amounts of work only** when the Procuring Entity's Representative **has given written instructions in advance for additional work to be paid for in that way**.

20.2. All work to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Procuring Entity's Representative. Each completed form shall be verified and signed by the Procuring Entity's Representative within two days of the work being done.

20.3. The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

21. Early Warning

21.1. The **Contractor shall warn** the Procuring Entity's Representative at the earliest opportunity **of specific likely future events or circumstances** that **may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works**. The Procuring Entity's Representative may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.

21.2. **The Contractor shall cooperate** with the Procuring Entity's Representative in making and considering proposals for **how the effect of such an event or circumstance can be avoided or reduced** by anyone involved in the work and in carrying out any resulting instruction of the Procuring Entity's Representative.

22. Program of Work

22.1. **Within the time** stated in the **SCC**, the **Contractor shall submit** to the Procuring Entity's Representative **for approval a Program of Work** showing the general methods, arrangements, order, and timing for all the activities in the Works.

22.2. An update of the Program of Work shall the show the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

22.3. The **Contractor shall submit** to the Procuring Entity's Representative **for approval an updated Program of Work at intervals no longer than the period stated** in the **SCC.** If the Contractor does not submit an updated Program of Work within this period, the PROCURING ENTITY's Representative may withhold the amount stated in the **SCC** from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program of Work has been submitted.

22.4. The Procuring Entity's Representative's approval of the Program of Work shall not alter the Contractor's obligations. **The Contractor may revise the Program of Work** and submit it to the Procuring Entity's Representative **again at any time**. A revised Program of Work shall show the effect of any approved Variations.

22.5. **When the Program of Work is updated**, the **Contractor shall provide** the Procuring Entity's Representative with an **updated cash flow forecast**. The cash flow forecast shall include different currencies, as defined in the Contract, converted as necessary using the Contract exchange rates.

22.6. **All Variations shall be included in updated Program of Work** produced by the Contractor.

23. Management Conferences

23.1. **Either the Procuring Entity's Representative** or the **Contractor may require** the other to attend **a Management Conference**. The Management Conference shall **review the plans for remaining work** and **deal with matters raised** in accordance with the **early warning procedure**.

23.2. The Procuring Entity's Representative shall record the business of Management Conferences and provide copies of the record to those attending the Conference and to the Procuring Entity. The **responsibility of the parties for actions** to be taken **shall be decided** by the PROCURING ENTITY's Representative either at the **Management Conference or after the Management Conference** and **stated in writing** to all who attended the Conference.

24. Bill of Quantities

24.1. The Bill of Quantities shall contain items of work for the construction, installation, testing, and commissioning of work to be done by the Contractor.

24.2. The Bill of Quantities is used to calculate the Contract Price. The **Contractor is paid for the quantity of the work done at the rate in the Bill of Quantities** for each item.

24.3. If the **final quantity of any work done differs** from the quantity in the Bill of Quantities for the particular item and **is not more than twenty five percent (25%) of the original quantity**, **provided the aggregate changes** for all items **do not exceed ten percent (10%) of the Contract price**, the Procuring Entity's Representative shall make the necessary adjustments to **allow for the changes** subject to applicable laws, rules, and regulations.

24.4. If requested by the Procuring Entity's Representative, the **Contractor shall provide** the Procuring Entity's Representative with **a detailed cost breakdown of any rate in the Bill of Quantities**.

25. Instructions, Inspections and Audits

25.1. The Procuring Entity's personnel shall **at all reasonable times during construction** of the Work be **entitled to examine, inspect, measure and test the materials and workmanship, and to check the progress of the construction**. The inspections, among other **inspections, are indicated** in the **SCC.**

25.2. If the Procuring Entity's Representative instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no defect, the test shall be a **Compensation Event**.

25.3. The Contractor shall permit the Funding Source named in the **SCC** to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by the Funding Source, if so required by the Funding Source.

26. Identifying Defects

The **Procuring Entity's Representative shall check the Contractor's work** and **notify the Contractor of any defects that are found**. Such checking shall not affect the Contractor's responsibilities. The Procuring Entity's Representative **may instruct the Contractor to search**or **uncover defects and test any work** that the **Procuring Entity's Representative considers below standards and defective**.

27. Cost of Repairs

Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Liability Periods **shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions**.

28. Correction of Defects

28.1. The Procuring Entity's Representative **shall give notice to the Contractor** of any defects **before the end of the Defects Liability Period**, which is One (1) year from project completion up to final acceptance by the Procuring Entity's.

28.2. Every time notice of a defect is given, **the Contractor shall correct** the notified defect**within the length of time specified in** the Procuring Entity's Representative's **notice**.

28.3. The Contractor shall correct the defects which he notices himself before the end of the Defects Liability Period.

28.4. The Procuring Entity shall certify that all defects have been corrected. **If the Procuring Entity considers that correction of a defect is not essential**, he can request the **Contractor to submit a quotation** for the corresponding **reduction in the Contract Price**. If the Procuring Entity accepts the quotation, the corresponding change in the **SCC** is **a Variation**.

29. Uncorrected Defects

29.1. The Procuring Entity **shall give the Contractor at least fourteen (14) days notice** of his intention **to use a third party to correct a Defect**. If the Contractor does not correct the Defect himself within the period, the Procuring Entity may have the Defect corrected by the third party. The **cost of the correction will be deducted from the Contract Price**.

29.2. The **use of** a **third party** to correct defects that are uncorrected by the Contractor **will in no way relieve the Contractorof its** liabilities and **warranties** under the Contract.

30. Advance Payment

30.1. The Procuring Entity shall, upon a written request of the contractor which shall be submitted as a contract document, make an advance payment to the contractor in an amount not exceeding fifteen percent (15%) of the total contract price, to be made in lump sum or, at the most two, installments according to a schedule specified in the **SCC**.

30.2. The advance payment shall be made only upon the submission to and acceptance by the Procuring Entity of an **irrevocable standby letter of credit** of equivalent value from a commercial bank, a **bank guarantee** or a **surety bond callable upon demand**, issued by a surety or insurance company duly licensed by the Insurance Commission and confirmed by the Procuring Entity.

30.3. The advance payment **shall be repaid by the Contractor** by an amount equal to the percentage of the total contract price used for the advance payment.

30.4. The contractor may reduce his standby letter of credit or guarantee instrument by the amounts refunded by the Monthly Certificates in the advance payment.

30.5. The Procuring Entity will provide an Advance Payment on the Contract Price as stipulated in the Conditions of Contract, subject to the maximum amount stated in **SCC** Clause 39.1.

31. Progress Payments

31.1. The Contractor may submit a request for payment for Work accomplished. Such request for payment shall be verified and certified by the Procuring Entity's Representative/Project Engineer. Except as otherwise stipulated in the **SCC**, **materials and equipment delivered on the site but not completely put in place shall not be included for payment**.

31.2. The Procuring Entity **shall deduct** the following **from the certified gross amounts** to be paid to the contractor as progress payment:

(a) Cumulative value of the work previously certified and paid for.

(b) Portion of the advance payment to be recouped for the month.

(c) **Retention money** in accordance with the condition of contract.

(d) Amount to cover third party liabilities.

(e) Amount to cover **uncorrected discovered defects** in the works.

31.3. Payments shall be adjusted **by deducting** there from the amounts for **advance payments and retention**. The Procuring Entity **shall pay the Contractor** the amounts certified by the Procuring Entity's Representative **within twenty eight (28) days from the date each certificate** was issued. No payment of interest for delayed payments and adjustments shall be made by the Procuring Entity.

31.4. The **first progress payment** may be paid by the Procuring Entity to the Contractor provided that **at least twenty percent (20%) of the work** has been accomplished as certified by the Procuring Entity's Representative.

31.5. Items of the Works for which a price of "0" (zero) has been entered will not be paid for by the Procuring Entity and shall be deemed covered by other rates and prices in the Contract.

32. Payment Certificates

32.1. The Contractor shall submit to the Procuring Entity's Representative **monthly statements of the estimated value of the work executed** less the cumulative amount certified previously.

32.2. The **Procuring Entity's Representative** shall **check the Contractor's monthly statement** and **certify the amount to be paid** to the Contractor.

32.3. The value of Work executed shall:

(a) **be determined by the Procuring Entity's Representative**;

(b) comprise the value of the quantities of the **items in the Bill of Quantities**; and

(c) include the valuations of approved variations.

32.4. The Procuring Entity's Representative may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

33. Retention

33.1. The Procuring Entity shall retain from each payment due to the Contractor an amount equal to a percentage thereof using the rate as specified in **GCC** Sub-Clause 42.2 below.

33.2. **Progress payments** are subject to **retention of ten percent (10%)**, referred to as the "retention money." Such retention shall be **based on the total amount due** to the Contractor **prior to any deduction** and shall be retained from every progress payment until fifty percent (50%) of the value of Works, as determined by the Procuring Entity, are completed. If, after fifty percent (50%) completion, the Work is satisfactorily done and on schedule, no additional retention shall be made; otherwise, the ten percent (10%) retention shall again be imposed using the rate specified therefor.

33.3. The total "**retention money**" shall be due for **release upon final acceptance** of the Works. The Contractor **may**, however, **request the substitution** of the retention money for each progress billing with irrevocable standby **letters** of credit from a commercial bank, bank **guarantees** or surety **bonds callable on demand**, of amounts equivalent to the retention money substituted for and acceptable to the Procuring Entity, provided that the project is on schedule and is satisfactorily undertaken. Otherwise, the ten (10%) percent retention shall be made. Said irrevocable standby letters of credit, bank guarantees and/or surety bonds, to be posted in favor of the Government shall be valid for a duration to be **determinedby** the concerned implementing office/agency or **Procuring Entity** and will answer for the purpose for which the ten (10%) percent retention is intended, *i.e.*, to cover uncorrected discovered defects and third party liabilities.

33.4. On completion of the whole Works, the Contractor **may substitute** retention money with an **"on demand" Bank guarantee** in a form acceptable to the Procuring Entity.

34. Variation Orders

34.1. Variation Orders may be issued by the Procuring Entity to cover any increase/decrease in quantities, including the introduction of new work items that are not included in the original contract or reclassification of work items that are either due to change of plans, design or alignment to suit actual field conditions resulting in

disparity between the preconstruction plans used for purposes of bidding and the "as staked plans" or construction drawings prepared after a joint survey by the Contractor and the Procuring Entity after award of the contract, provided that the cumulative amount of the Variation Order **does not exceed ten percent (10%) of the original project cost**. The addition/deletion of Works should be within the general scope of the project as bid and awarded. The scope of works shall not be reduced so as to accommodate a positive Variation Order. A Variation Order may either be in the form of a **Change Order** or **Extra Work Order**.

34.2. A **Change Order** may be issued by the Procuring Entity to cover any **increase/decrease in quantities** of original Work items in the contract.

34.3. An **Extra Work Order** may be issued by the Procuring Entity to cover the introduction of **new work necessary** for the completion, improvement or protection of the project which were not included as items of Work in the original contract, such as, where there are **subsurface or latent physical conditions at the site** differing materially from those indicated in the contract, or where there are duly unknown physical conditions at the site of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in the Work or character provided for in the contract.

34.4. Any cumulative Variation Order **beyond ten percent (10%)** shall be **subject of another contract to be bid out** if the works are separable from the original contract. In exceptional cases where it is **urgently necessary to complete** the original scope of work, the Head of the Procuring Entity **may authorize a positive Variation Order** go **beyond ten percent (10%)but not more than twenty percent (20%)** of the original contract price, **subject to the guidelines to be determined by the GPPB**: *Provided, however,* That appropriate sanctions shall be imposed on the designer, consultant or official responsible for the original detailed engineering design which failed to consider the Variation Order beyond ten percent (10%).

34.5. In claiming for any Variation Order, the Contractor shall, within seven (7) calendar days after such work has been commenced or after the circumstances leading to such condition(s) leading to the extra cost, and within twenty-eight (28) calendar days deliver a written communication giving full and detailed particulars of any extra cost in order that it may be investigated at that time. Failure to provide either of such notices in the time stipulated shall constitute a waiver by the contractor for any claim**[Refer to Section V, SCC 43.5for correction]**. The preparation and submission of Variation Orders are as follows:

(a) If the Procuring Entity's representative/**Project Engineer** believes that a Change Order or Extra Work Order should be issued, **he shall prepare the proposed Order accompanied with the notices** submitted by the Contractor, the plans therefore, **his computations as to the quantities of the additional works** involved per item indicating the specific stations where such works are needed, **the date of his inspections andinvestigations** thereon, and **the log book thereof**, and **a detailed estimate of the unit cost** of such items of work, **together with his justifications** for the need of such Change Order or Extra Work Order, and shall **submit the same to the Head of the Procuring Entity for approval**.

(b) The Head of the Procuring Entity or his duly authorized representative, upon receipt of the proposed Change Order or Extra Work Order shall immediately instruct the technical staff of the Procuring Entity's to conduct an on-the-spot investigation to verify the need for the Work to be prosecuted. A report of such verification shall be submitted directly to the Head of the Procuring Entity or his duly authorized representative **[Refer to Section V, SCC 43.5 for correction]**.

(c) The, Head of the Procuring Entity or his duly authorized representative, after being satisfied that such Change Order or Extra Work Order is justified and necessary, shall review the estimated quantities and prices and forward the proposal with the supporting documentation to the Head of Procuring Entity for consideration**[Refer to Section V, SCC 43.5 for correction]**.

(d) If, after review of the plans, quantities and estimated unit cost of the items of work involved, the proper office of the procuring entity empowered to review and evaluate Change Orders or Extra Work Orders recommends approval thereof, Head of the Procuring Entity or his duly authorized representative, believing the Change Order or Extra Work Order to be in order, shall approve the same**[Refer to Section V, SCC 43.5 for correction]**.

(e) The timeframe for the processing of Variation Orders from the preparation up to the approval by the Head of the Procuring Entity concerned shall not exceed thirty (30) calendar days.

35. Contract Completion

Once the project reaches an accomplishment of **ninety five (95%) of the total contract amount**, the Procuring Entity may **create an inspectorate team** to make preliminary inspection and **submit a punch-list to the Contractor** in preparation for the final turnover of the project. Said **punch-list will contain**, among others, the **remaining Works**, Work **deficiencies for necessary corrections**, and the **specific duration**/time to fully complete the project considering the approved remaining contract time. This, however, shall not preclude the claim of the Procuring Entity for liquidated damages.

36. Suspension of Work

36.1. The **Procuring Entity shall have the authority to suspend the work** wholly or partly by written order for such period as may be deemed necessary, **due to *force majeure* or any fortuitous events** or **for failure on the part of the Contractor to correct bad conditions which are unsafe for workers or for the general public**, **to carry out valid orders** given by the Procuring Entity or to perform any provisions of the contract, or due to adjustment of plans to suit field conditions as found necessary during construction. The Contractor shall immediately comply with such order to suspend the work wholly or partly.

36.2. The **Contractor or its duly authorized representative shall have the right to suspend work operation** on any or all projects/activities along the critical path of activities after fifteen (15) calendar days from date of receipt of written notice from the Contractor to the district engineer/regional director/consultant or equivalent official, as the case may be, due to the following:

(a) There exist right-of-way problems which prohibit the Contractor from performing work in accordance with the approved construction schedule.

(b) Requisite construction plans which must be owner-furnished are not issued to the contractor precluding any work called for by such plans.

(c) Peace and order conditions make it extremely dangerous, if not possible, to work. However, this condition must be certified in writing by the Philippine National Police (PNP) station which has responsibility over the affected area

and confirmed by the Department of Interior and Local Government (DILG) Regional Director.

(d) There is failure on the part of the Procuring Entity to deliver government-furnished materials and equipment as stipulated in the contract.

(e) **Delay in the payment of Contractor's claim for progress billing beyond forty-five (45) calendar days** from the time the Contractor's claim has been certified to by the procuring entity's authorized representative that the documents are complete unless there are justifiable reasons thereof which shall be communicated in writing to the Contractor.

36.3. In case of total suspension, or suspension of activities along the critical path, which is not due to any fault of the Contractor, the elapsed time between the effective order of suspending operation and the order to resume work shall be allowed the Contractor by adjusting the contract time accordingly.

37. Payment on Termination

37.1. **If the Contract is terminated because of a fundamental breach** of Contract by the Contractor, the Procuring Entity's Representative **shall issue a certificate for the value of the work done and Materials ordered** less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as indicated in the **SCC**. **Additional Liquidated Damages shall not apply**. If the total amount due to the Procuring Entity exceeds any payment due to the Contractor, the difference shall be **a debt payable to the Procuring Entity**.

37.2. If the Contract is terminated for the Procuring Entity's convenience or because of a fundamental breach of Contract by the Procuring Entity, the Procuring Entity's Representative **shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works**, and less advance payments received up to the date of the certificate.

37.3. The **net balance due shall be paid or repaid within twenty eight (28) days** from the notice of termination.

37.4. If the Contractor has terminated the Contract under **GCC** Clauses 17 or 9, the Procuring Entity shall promptly return the Performance Security to the Contractor.

38. Extension of Contract Time

38.1. Should the amount of additional work of any kind or other special circumstances of any kind whatsoever occur such as to fairly entitle the contractor to an extension of contract time, the Procuring Entity shall determine the amount of such extension; provided that **the Procuring Entity is not bound to take into account** any claim for an extension of time **unless the Contractor has**, **prior to the expiration** of the contract time **and within thirty (30) calendar days after** such work has been commenced **or after the circumstances leading to such claim have arisen**, **delivered to the Procuring Entity notices** in order that **it could have investigated**

them at that time. **Failure** to provide such notice shall **constitute a waiver by the Contractor of any claim**. Upon receipt of full and detailed particulars, the Procuring Entity shall examine the facts and extent of the delay and shall extend the contract time completing the contract work when, in the Procuring Entity's opinion, the findings of facts justify an extension.

38.2. **No extension** of contract time shall be granted the Contractor **due to (a) ordinary unfavorable weather conditions** and (b) **inexcusable failure or negligence** of Contractor to provide the required equipment, supplies or materials.

38.3. Extension of contract time may be granted only when the affected activities fall **within the critical path of the PERT/CPM network**.

38.4. No extension of contract time shall be granted when the reason given to support the request for extension was already considered in the determination of the original contract time during the conduct of detailed engineering and in the preparation of the contract documents as agreed upon by the parties before contract perfection.

38.5. Extension of contract time **shall be granted for rainy/unworkable days** considered unfavorable for the prosecution of the works at the site, based on the actual conditions obtained at the site, in excess of the number of rainy/unworkable days pre-determined by the Procuring Entity in relation to the original contract time during the conduct of detailed engineering and in the preparation of the contract documents as agreed upon by the parties before contract perfection, and/or for equivalent period of delay **due to major calamities** such as exceptionally destructive typhoons, floods and earthquakes, and epidemics, and **for causes such as non-delivery on time** of materials, working drawings, or written information **to be furnished by the Procuring Entity**, **non-acquisition of permit to enter private properties** within the right-of-way resulting in complete paralyzation of construction activities, and **other meritorious causes** as determined by the Procuring Entity's Representative and **approved by the Head of the Procuring Entity**. **Shortage of construction materials, general labor strikes, and peace and order problems** that disrupt construction operations through **no fault of the Contractor may be considered as additional grounds** for extension of contract time provided **they are publicly felt** and **certified by appropriate government agencies such as DTI, DOLE, DILG, and DND, among others**. The **written consent of bondsmen must be attached** to any request of the Contractor for extension of contract time and submitted to the Procuring Entity for consideration and the validity of the Performance Security shall be correspondingly extended.

39. Price Adjustment

Except for extraordinary circumstances as determined by NEDA and approved by the GPPB, **no price adjustment shall be allowed**. Nevertheless, in cases where the cost of the awarded contract is affected by any applicable **new laws**, ordinances, regulations, or other acts of the GOP, **promulgated after the date of bid opening**, a contract price adjustment shall be made or appropriate relief shall be applied **on a no loss-no gain basis**.

40. Completion

The Contractor **shall request** the Procuring Entity's Representative to issue a **certificate of Completion of the Works**, and the Procuring Entity's Representative will do so upon deciding that the work is completed.

41. Taking Over

The Procuring Entity shall take over the Site and the Works **within seven (7) days from** the date the Procuring Entity's Representative **issues a certificate of Completion**.

42. Operating and Maintenance Manuals

42.1. If **"as built" Drawings** and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the **SCC**.

42.2. **If the Contractor does not supply the Drawings** and/or manuals by the dates stated in the **SCC**, or they do not receive the Procuring Entity's Representative's approval, the Procuring Entity's Representative **shall withhold the amount** stated in the **SCC** from payments due to the Contractor.

SECTION V

SPECIAL CONDITIONS OF CONTRACT

SECTION V – SPECIAL CONDITIONS OF THE CONTRACT

This Section V, Special Conditions of the Contract amends and/or supplements Section IV, General Conditions of Contract of these Bidding Documents. In case of discrepancy between Section V and IV, the provisions of Section V shall prevail.

<table>
<tr><th>GCC Clause</th><th>Description</th></tr>
<tr><td>1.16</td><td>The Intended Completion Date is/are:
<table>
<tr><th>Lot No.</th><th>Division/Name of School</th><th>Contract Duration in Calendar Days</th><th>Intended Completion Date</th></tr>
<tr><td>1</td><td>Division of Misamis Oriental/ Consuelo Elementary School</td><td>90 days</td><td>Date of the Effectivity of NTP plus Contract Duration</td></tr>
</table></td></tr>
<tr><td>1.21</td><td>The Procuring Entity is the

DepEd Division of Misamis Oriental
A.Velez Street, Cagayan de Oro City</td></tr>
<tr><td>1.22</td><td>The Procuring Entity's Representative is

Name: Jean G. Veloso
Designation: Assistant Schools Division Superintendent
Complete Office Address: A.Velez St.,Cagayan de Oro City
_____
Telephone No.: 08822724615</td></tr>
<tr><td>1.23</td><td>The locations of the sites are as follows:
<table>
<tr><th>Lot No.</th><th>Division</th><th>Name of School</th><th>Address</th></tr>
<tr><td>1</td><td>Division of Misamis Oriental</td><td>Consuelo Elementary School</td><td>Magsaysay, Misamis Oriental</td></tr>
</table></td></tr>
<tr><td>1.27</td><td>The Start Date is seven (7) calendar days from receipt of the Notice to Proceed.</td></tr>
<tr><td>1.30</td><td>The Works consist of Repair and Rehabilitation of School Buildings in Consuelo ES. Magsaysay, Misamis Oriental under the CY 2015 Basic Educational Facilities Fund</td></tr>
<tr><td>2.2</td><td>Sectional Completion

No further instruction</td></tr>
<tr><td>5.1</td><td>The Procuring Entity shall give possession of all parts of the Site to the Contractor after a pre-construction meeting between the authorized representatives of the Procuring Entity and the Contractor.</td></tr>
<tr><td>6.1</td><td>All Materials and Plant on Site shall be deemed to be the property of the Procuring Entity. Contractor shall submit its/his/her Materials Delivery/Utilization Schedule using the form, provided in Section IX, within 10 days from its/his/her receipt of the NOA.</td></tr>
<tr><td>6.5</td><td>The Contractor shall employ the following Key Personnel:
Project Manager, Project Engineer, Materials Engineer and Foremen</td></tr>
<tr><td>7.4(c)</td><td>Performance Security
No further instruction.</td></tr>
</table>

7.7	Performance Security No further instruction.
Error! Reference source not	Sub-contracting No further instruction.
10	The site investigation reports It shall be the responsibility of the Contractor to obtain the site investigation reports.
12.3	Contractor's Risk and Warranty Security No further instruction.
12.5	Contractor's Risk and Warranty Security In case of permanent structures, such as buildings of types 4 and 5 as classified under the National Building Code of the Philippines and other structures made of steel, iron, or concrete which comply with relevant structural codes (e.g., DPWH Standard Specifications), such as, but not limited to, steel/concrete bridges, flyovers, aircraft movement areas, ports, dams, tunnels, filtration and treatment plants, sewerage systems, power plants, transmission and communication towers, railway system, and other similar permanent structures: Fifteen (15) years.
4	*Liability of the Contractor* All partners to the joint venture shall be jointly and severally liable to the Procuring Entity. The Contractor shall be liable to pay or reimburse the actual costs of hospitalization or medical expense(s) of Procuring Entity's personnel due to accident(s), which may befall or happento said personnel during his/her/their inspection of contractor's works at construction site, as a result of contractor's sub-standard works/materials, omission(s) or negligence. In addition, the contractor shall also pay or reimburse the actual transportation costs incidental to the hospitalization or medical treatment of said personnel. Claim for payment or reimbursement for hospitalization or medical expenses and transportation costs incidental thereto shall be approved by the head of the procuring entity and supported by a medical certificate signed by a licensed doctor and an official report of the result of the inspection describing the sub-standard works/materials, omission(s) or negligence of the contractor duly signed by the procuring entity's personnel. In reimbursing herein mentioned expenses, the contractor may require submission of the official receipts or other reasonable proof of expenses incurred by the procuring entity's personnel. This condition is without prejudice to contractor's right to verify the veracity of herein mentioned official report of procuring entity's personnel. In case the Contractor fails to pay or reimburse said hospitalization or medical and incidental transportation expenses within seven (7) calendar days after contractor's receipt of a demand letter from procuring entity's personnel, the contractor hereby authorizes the procuring entity to deduct said expenses from payment(s) due the contractor under this infrastructure project.
18.3(h)(i)	Termination for Other Causes No further instruction.
12.2	Resolution of Disputes The Arbiter is: Construction Industry Arbitration Commission, or any other arbiter in accordance with GCC 21.3.

28	Contractor's Right to Claim GCC 28 shall be read as "If the Contractor incurs cost as a result of any of the events under **GCCClause 27.1**, the Contractor shall be entitled to the amount of such cost subject to the conditions under **GCC clause 43**. If as a result of any of the said events, it is necessary to change the Works, this shall be dealt with as a Variation.
20.1	*Dayworks:* Day works are applicable at the rate shown in the Contractor's original Bid.
22.1	Program of work The Contractor shall submit, within ten calendar days from its receipt of the Notice of Award, a Program of Work to the Procuring Entity's Representative for approval together with its Letter of Acceptance of or conformity with the Notice of Award.
22.3	Program of work The period between Program of Work updates is *thirty (30) calendar* days. The amount to be withheld for late submission of an updated Program of Work is *25% of the amount of the progress payment being billed.*
34	**Instructions, Inspections and Audit.** The Procuring Entity's representative shall conduct the following fifteen (15) key inspection points at all reasonable times during the progress of the works: 1) Layout – Site Plan and Building Layout 2) Foundations – Excavation and Backfilling 3) Concrete works – Footing and Tie Beams 4) Concrete Works – Columns 5) Concrete Works – Beams and Suspended Slabs 6) Walls – Masonry and Plastering 7) Walls – Doors and Windows 8) Roof – Framing 9) Roof – Sheeting 10) Roof – Ceiling 11) Floors – Concrete & Tiles 12) Finishing – Painting 13) Finishing – Sanitary 14) Finishing – Electrical 15) Handover (Turnover)
34.3	The **Funding Source** is the **CY 2015 General Appropriations Act under the Basic Educational Facilities Fund of the Department of Education**
39.1	Advance Payment The amount of the advance payment is *15% of the Contract Price.*
40.1	Progress Payments The first progress billing shall have a minimum physical accomplishment of 20%.

43.5	In claiming for any Variation Order, the **contractor** shall, within seven (7) calendar days after such work has been commenced pursuant to **Section 3.2** of the Annex E of the Revised IRR of RA 9184 quoted herein; or, within twenty-eight (28) calendar days after the circumstances or reasons justifying a claim for extra cost shall have occurred, **deliver a notice** giving full and detailed particulars of any extra cost in order that it may be investigated at that time. Failure to provide either of such notices in the time stipulated shall constitute a waiver by the contractor for any claim***(Corrected thru GPPB Res. No. 08-2011 dated 10/7/11)***. The preparation and submission of Variation Orders are as follows: a) If the procuring entity's representative/**Project Engineer** believes that a Change Order or Extra Work Order should be issued, he shall prepare the proposed Order accompanied with the notices submitted by the contractor, the plans therefore, his computations as to the quantities of the additional works involved per item indicating the specific stations where such works are needed, the date of his inspections and investigations thereon, and the log book thereof, and a detailed estimate of the unit cost of such items of work, together with his justifications for the need of such Change Order or Extra Work Order, and shall submit the same to the Head of the Procuring Entity for approval. **b)** The Head of the Procuring Entity or his duly authorized representative, upon receipt of the proposed Change Order or Extra Work Order shall immediately instruct the **appropriate technical staff** or office of the procuring entity to conduct an on-the-spot investigation to verify the need for the work **to be prosecuted** and to review the proposed plan, quantities, and prices of the work involved. **(Corrected thru GPPB Res. No. 08-2011 dated 10/7/11)** c) The **technical staff** or appropriate office of the procuring entity shall submit a report of their findings and recommendations, together with supporting documents, to the Head of the Procuring Entity or his duly authorized representative for consideration. **(Corrected thru GPPB Res. No. 08-2011 dated 10/7/11)** d) The **Head of the Procuring Entity** or his duly authorized representative, acting upon the recommendation of the **technical staff** or appropriate office, shall approve the Change Order or Extra Work Order after being satisfied that the same is justified, necessary, and in order. **(Correction thru GPPB Res. No. 08-2011 dated 10/7/11)** e) The **timeframe** for the processing of Variation Orders from the preparation up to the approval by the procuring entity concerned shall not exceed thirty **(30)** calendar days. **Section 3.2. of Annex E of RA 9184 Revised IRR** **(Contract Implementation Guidelines for the Procurement of Infrastructure Projects)** "However, under any of the following conditions, the procuring entity's representative/**Project Engineermaysubject to the availability of funds** and within the limits of his delegated authority, **allow the immediate start of work** under any Change Order or Extra Work Order: i) In the event of **an emergency** where the prosecution of the work is urgent to avoid detriment to public service, or damage to life and/or property; and/or

	ii) When time is of the essence; Provided, however, That such approval is valid on work done up to the point where the cumulative increase in value of work on the project which has not yet been duly fully approved **does not exceed** five percent (**5%**) of the adjusted original contract price (Deleted: whichever is less); (Corrected thru GPPB Res. No. 08-2011 dated 10/7/11) Provided, further, that immediately after the start of work, the corresponding Change Order or Extra Work Order shall be prepared and **submitted for approval** in accordance with the above rules herein set. **Payments** for works satisfactorily accomplished on any Change Order or Extra Work Order **may be made only after approval of the same by the Head of the Procuring Entity** or his duly authorized representative. (Correction thru GPPB Res. No. 03-2011 dated 1/28/11) Provided, finally, That for a Change Order or Extra Work Order involving a cumulative amount exceeding five percent (5%) of the original contract price, no work thereon **may be** commenced unless said Change Order or Extra Work Order has been **approved** by the **Head of the Procuring Entity or his duly authorized representative**. (Corrected thru GPPB Res. No. 08-2011 dated 10/7/11)
51.1	The date by which the **Operating and Maintenance Manuals** are required is the date of submission of the request for final billing. The date by which **"As-Built" drawings** are required is the date of submission of the request for final billing.
51.2	The amount to be withheld for failing to produce **"As-Built" drawings and/or operating and maintenance manual** by the date required is35% of the amount of final billing.

SECTION VI

GENERAL SPECIFICATIONS

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SECTION VI – GENERAL SPECIFICATIONS

A. LICENSE AND PERMITS

The Contractor shall secure from the government agencies all necessary licenses and permits needed to proceed with the construction of the Project.

B. TEMPORARY SIGN

The Contractor shall provide suitable sign acceptable to the Owner advertising the work and indicating thereon the names of the Project, the Contractor and the Architect. The sign layout and the text and location of such sign will be approved by the Owner. No other sign or advertising will be permitted.

C. TEMPORARY STRUCTURES AND SERVICES

Temporary Building and Facilities

- Temporary Buildings shall be of a design and materials acceptable to the Owner.

Contractor's Office

- The Contractor shall provide on or near the premises, temporary building for his own use, equipped among other items with at least one telephone.

Field Office

- The Contractor shall provide temporary office building at least 12' 0" wide by 30' 0" long for the use of the field representatives, Architects, at an approved location on or adjacent site. The field office shall be complete with electrical light, power outlets, drinking water, two (2) desks, two chairs, a plan table, a plan rack, filing cabinet, private local telephone line and daily janitorial service, including periodic washing of windows. The Contractor shall pay for all of the above services and facilities except long distance telephone calls.

Toilets

- The Contractor shall provide suitable toilet facilities at approved location (2) with proper enclosures for the use of workmen, and shall maintain some in sanitary operable conditions, all in conformity with the local regulations.

Other Temporary Buildings

- The Contractor shall provide such other temporary building as maybe required for use of his workmen and safe storage of tools and materials. Such structures shall be located only where previously approved.

Temporary Electric Power

- The Contractor shall provide and pay for all light and Owner required for the construction work including all wiring, connections and accessories an all power consumed.

Temporary Water Supply

- The Contractor shall make all necessary arrangements for and provision of water including temporary piping and house extensions required for the construction purposes. He shall obtain and pay for necessary permits and for all water used.

Temporary Parking Facilities

- The Contractor shall provide and maintain in a safe and satisfactory condition temporary facilities for use by workmen employed on the job and for the Owner, the Project Manager and the Architect's use.

Temporary Scaffolding, Hoist, etc.

- The Contractor shall install and operate an adequate number of temporary hoists and shall also furnish and maintain temporary scaffolds, runways, ladders, and the like as required for the proper execution of the work. As soon as the progress of the work will permit, the Contractor shall erect the permanent stair platforms, ramps, catwalks, etc., safeguard and shall provide these and all other permanent parts from damage or defacement during the work.

Removal of Temporary Services and Facilities

- All temporary services and facilities installed by the Contractor shall be removed by the Contractor on completion of this Contract or as directed by the Project Manager. The Contractor shall make any repairs or alterations necessitated by such removal.

D. PROTECTION OF WORK, PROPERTY, AND PERSONS

- The Contractor shall protect the work of employees, equipment at the Owner's property and adjacent property from damage for any cause whatsoever, and shall be responsible for any damage or injury (including death) due to his act or neglect. These provisions are solely for the benefit of third persons.

- The Contractor as, part of the contract shall provide watchmen and erect all planking bridges, bracings, shorings, sheet piling, lights and warning signs necessary for the public. The Contractor shall provide scaffolds, tarpaulins, and similar items as directed by the Project Manager to protect Owners, equipment and employees and shall if necessary seal off his work so as not to interfere with Owner's business operation.

Watchmen Service

- The Contractor shall provide reputable watchmen service or in lieu thereof, any approved protective service to guard the construction area against vandalism, theft, and mischief. Such service should be in operation at all hours that the Contractor's supervisory staff is not in attendance at the site, 24 hours per day and 7 days per week from the date of Contractor starts work until the date of final acceptance of the work under this Contract.

- Watchmen or approved protective service shall continue uninterrupted during delays in the work such as inclement weather, delays in delivery, and the like. In the event of any official work stoppage of the Project, make immediate arrangements with the Owner regarding watchmen service continuation and cost thereof during the time the work will be stopped. If such official stoppage is found to be due to fault, neglect or improper work performance of the Contractor, or his sub-contractors, the extra cost for watchmen service shall be borne by the Contractor.

The Contractor shall be responsible for any injury loss or damage to any presently existing improvements on the premises caused by him or his employees, agents or any sub-contractors, and in the event of such injury, loss or damage shall promptly make such repairs or replacement as required by the Owner without additional cost to the Owner.

During the progress of the work, the Contractor shall protect all finished work as soon as it is erected and shall maintain such protection until such time they are no longer required.

E. INSPECTION AND TEST

- The Contractor shall permit and facilitate inspection of the work by the Owner, its representatives, the Project Manager, or his authorized representative, and the public authorities having jurisdiction at all times during the progress of the work.

- The Contractor will be responsible for all test and engineering services required by the Specifications. The cost for inspection or tests not required by the specification but which the Owner requires, will be borne by the Owner.

- All tests shall be performed by the testing agency approved by the Owner and shall be in accordance with the current standards of the American Society for Testing and Materials unless otherwise specified by the Owner. The Contractor shall furnish the Owner with 2 copies of the test procedures used.

- Failures of the Owner, the Project Manager or the Architect during the progress work or work not in accordance with the Drawings and Specifications shall not be deemed an acceptance thereof nor waiver of the Owner's right to a proper execution of the Contract work or any part of it. No partial payment of entire occupancy of the premises by the Owner shall be construed to be an acceptance of work or materials which are not strictly in accordance with the Contract Documents, nor a waiver of the Owner's right.

F. CONTRACTOR'S ROAD AND TRAFFIC LIMITATIONS

- Contractor shall make himself fully aware of any restrictive traffic limitations and/or shall comply with request of local authorities in this construction plan and equipment, to and from the site, as routes, entry and exit on site, times of delays, etc.

- Prior to moving equipment or materials to the site, the Contractor shall secure the Project Manager's approval of the specific roadway route on or adjacent to the site to be used. He shall thereafter be limited to the use of said roadways or route unless the Project Manager first approves the use of alternate roadway or routes.

G. SECURITY OF EQUIPMENT AND OPERABLE MACHINERY

- Site-parked mobile equipment and operable machinery, and hazardous parts of the new construction subject to mischief shall be kept locked or otherwise made inoperable whenever left unattended.

H. PESTILENCE CONTROL

- Contractor shall guard against and if necessary exterminate rodents, termites, vermin and other pests. All job personnel shall be required to dispose of garbage and refuse in covered metal containers, which Contractor shall furnish and empty regularly. Should services of extermination firm be necessary, the Contractor shall provide such services.

I. AIR POLLUTION

- Contractor shall comply with the requirements of "The Clean Air Act of 1999" and of local authorities regarding air pollution control: As a general rule, shall be no burning of trash at the site.

J. CLEANING

- The Contractor shall at all times keep the premises from accumulation of waste materials or rubbish caused by his employees, sub-contractors, or the work. At completion of the work he shall remove from the building and site all rubbish, scaffolding and surplus materials and shall leave the work broom clean, unless otherwise specified. If the Contractor fails to keep the premises clean, the Project Manager may remove the waste materials and rubbish; charge the expense of such removal to the Contractor.

- The Contractor shall thoroughly wash and clean all glass, clean hardware, remove stains, spots, smears, marks and dirt from all surfaces; clean fixtures, wash terrazzo, tile floors and all exposed concrete so as to present clean work to the Owner for acceptance.

K. FINAL COMPLETION

- The term final completion, means the completion of all work called for under the Contract to include but not limited to satisfactory operation of all equipment, by means of acceptance tests, correction of all punch list items to the satisfaction of the Owner, the Project manager and/or the Architect, settlement of all claims, if any payment and release of all record of all mechanics materials, men and like lines, delivery of all guarantees, Equipment Operation and Maintenance Manuals; as built drawings, Building certificates prior to occupancy; Electrical permits; all other required approvals and acceptance by the City/Municipality or other authority having jurisdiction and removal of all rubbish, tolls scaffoldings and surplus materials and equipment from the job site.

L. PUNCH LIST

- The list prepared by the Project manager and the Architect of the Contractor's uncompleted defective or uncorrected work.

M. AS BUILT DRAWINGS

- The drawings to be submitted by the Contractor to the Owner, illustrating how the various elements of the work were actually installed during the progress of the construction. As built Drawings shall be approved by the Architect and the Project Manager.

- The Contractor shall keep "as-built" drawings up to date concurrently as the work progresses and not wait until the end of the job to do so.

N. CONNECTING THE WORK

- The Contractor shall do all the cutting, fitting and pitching that may be required to make several parts of the work come together properly and to fit his work to receive or be received by the work of other contractor shown upon, or reasonable implied by the Drawings and Specification. After the other contractor has finished he shall properly complete and finish his work, as the Project Manager shall direct.

O. SAFETY AND ACCIDENT REPORTS

- The Contractor shall take necessary precautions for the safety of all employees; Owner's Representatives, Project Manager and the Architect. The Contractor shall comply with all instructions and Government Safety laws and Building Codes to prevent accident or injury to persons on about or adjacent to the premises as well as for the protection of adjacent property where work is performed. The Contractor shall not excessively loaded.

SOIL POISONING

A. SCOPE OF WORK

- Furnish all labor materials, equipment, plant and other facilities and perform all operations necessary to complete the Soil Poisoning requirement hereinafter specified.

- All work under this Division shall be subject to the General Conditions accompanying these Specifications. The Contractor and the Sub-Contractor for this portion of the work is required to refer especially thereto.

B. APPLICATION

- Thoroughly drench and saturate every lineal meter of excavation for footings and other foundation work with soil poison working solution (F-3, or F-35 by MAPECON or approved equivalent) before pouring of concrete. Soil poisons shall not be applied when soil is excessively wet.

- After grading and leveling the soil and laying of the gravel base for floor slab, flood or soak every square meter of floor area with soil poison working solution before pouring of concrete.

- Prior to landscaping of the lawn, saturate every linear meter of perimeter of the building about three (3) meters wide with soil poison working solutions.

- The application of the chemical solution shall be performed by a competent Pest Controller following the Thropallaxis Method or approved equivalent.

C. WOOD PROTECTION

- Paris Green Solution. Apply one (1) coat solution of 100 grams green powder mixed with 4.40 liters diesel all wood members with minor “Banakal”.

- Spar Varnish. All exposed surfaces of doors, windows, and exterior roof fascia boards shall be painted with a base coat or linseed oil before application of spar vanishes.

PREPARATION OF SITE

A. SCOPE OF WORK

- Furnish all labor materials, equipment, plant and other facilities and perform all operations necessary to complete the preparation of site shown and hereinafter specified.

- All work under this division shall be subject to the General Condition, accompanying these Specifications. The Contractor and sub-contractor for this portion of work are required to refer especially thereto.

B. SURVEY

- The Contractor shall stake out the building accurately and shall establish grades and after the approval by the Project Manager and Architects shall be secured before further work is commenced.

- Basic batter boards and basic reference marks as directed by the Project Managers shall be erected at such places where they will not be disturbed during construction.

- Materials shall be stored and work shall be conducted in such manner as to preserve all references approved the Project Manager and the Architect. Reestablishment of lines and grades where necessitated due to negligence of part the contractor shall be done at the expense of the Contractor.

- The Contractor shall construct two (2) permanent benchmarks near the site of construction for the purpose of determining any settlement that may occur during the progress of construction.

- The Contractor shall provide all necessary instruments.

UTILITIES EXCAVATION

A. SCOPE OF WORK

- Furnish all materials, equipment, labor, plant and other facilities to complete all utilities excavating work shown on the drawings and hereinafter specified.

- All Work included under this division shall be subject to the General Conditions accompanying these specifications. The Contractor and sub-contractor are required to refer especially thereto.

B. MATERIALS

- Provide all materials, equipment, labor, plant and other fine granular materials as approved. Soil removed in the excavation process maybe used for back fill if meeting the above qualifications approved by the Project Manager.

- Make widths of trenches at bottom and above sufficient for working conditions, including bracing, sheeting and shoring if any should be necessary to adequately protect men at work.

- For pipe, make trench with at bottom between 30 and 40 cm greater than outside diameter of pipe measured at widest point of pipe.

- Make centerline of trench and centerline of pipe and structures coincide.

- Accurately grade bottom of trench to provide uniform bearings; support pipe on undisturbed soil for each length of pipe.

- After grading trench bottom, dig bell holes for bell point pipe. Make bell holes of sufficient size as a minimum to permit accurate caulking work.

- Sheet and shore as necessary. Refer to and conform to specifications for such work required in operations for which this section serves as a reference.

- Take precautions to prevent over-excavation of earth in trench. For rock abode and like solid materials excavate to a minimum over depth of 10cm below required for outside of pipe.

- Correct over depth excavation due to negligence or faulty work of Contractor or for removal of undesired materials as noticed in paragraph H above by back filling with compacted fine granular materials. Stack excavated materials in orderly manner adjacent to work except in street. Stack in manner to divert surface water from running into trench. Remove accumulations of water from trenches by pumping or other approved method.

C. SHEETING AND SHORING

- Provide sheeting and shoring as required to protect trench excavations and provide safe working conditions. This requirement shall be at the sole decision and responsibility of the Contractor including the remedy and satisfactory of all damages and liabilities occasioned by the entire operation.

- Where damage is likely to result from withdrawing sheeting, the sheeting will be ordered to be left in place by the Project Engineer.

D. BACKFILLING

- Do not backfill until underground piping and conduit have been tested and approved by proper authorities or until Project manager authorize back filling.

- Remove bracing, sheeting and shoring before back filling, except such sheeting as Project Manager may require in order to be left in place. Cut off sheeting ordered to be left in place at level of top of pipe.

- Backfill entire depth of trench with damp, compacted sand at following locations.

- Trenches within limits of building and 91 cm outside foundations.
- Trenches under footing, pavements, concrete slabs, sidewalks, utility pipes and other load bearing items and 91 cm beyond.

- Spread sand by hand shoveling in layers not more than 15 cm thick and compact to degree or compaction satisfactory to the Project Manager or his representative but not greater than for fills specified under division SEB, except in streets compact per City Regulations. Carry out spreading and tamping simultaneously in layers.

- Backfill all other trenches with ample sand to top of pipe. Earth, sand, clay and gravel, all constitute approved excavated material. Deposit by hand shoveling in 15 cm thick layers until pipe or conduit has a cover of not less than 30 cm., with earth moving equipment. Make ample allowances for settlement.

- Use water, but not excessive quantities for setting earth or sand backfill.

- Fill settled areas before final inspection and acceptance.

STRUCTURAL EXCAVATION AND BACKFILL

A. SCOPE OF WORK

- Furnish all materials, equipment, labor, plant and other facilities to complete the structural excavation and backfill as shown and hereinafter specified.

- All work included under this division shall be subject to the General Conditions accompanying these Specifications. The Contractor and Sub-Contractor are required to refer especially thereto.

- Examine the list of record of existing utilities and construction, record of the test borings and sub-surface exploration reports and soil samples to determine the conditions under which work will be performed. The record of test borings is not guaranteed to represent all conditions that will be encountered.

B. APPLICABLE CODES AND STANDARDS

- The Standards and Codes applicable to only a portion of the work specified in this section are referenced in the relevant parts and clauses. Standards and codes, which are generally applicable to the work of this section, are listed hereinafter.

- 2.2 AASHTO - American Association of States Highways and Transportation Officials.

- T88 - Mechanical Analysis of Soils

- T90 - Determining the Plastic Limit and Plasticity Index of Soils

- 2.3 ASTM - American Society for Testing and Material

- C33 - Concrete Aggregates

- D1556 - Density of Soil – in – Place by the Sand – Cone Method

- D1557 - Moisture Dust Density relations of soils, using ten-pound rammer and eighteen-dust inch crop.

C. SUBMITTALS

- Samples of any materials or product to be used in the works. They shall be properly marked and accompanied by a letter of transmittal clearly listing the samples, their intended use and locations in the works.

- Test Reports Shop test shall show the results of required shop tests of materials, equipment or system certified in writing by the manufacturer or its authorized representative.

D. TRANSPORTATION, HANDLING, STORAGE AND PROTECTION

- Pumping and Drainage

  Excavate areas so as to afford adequate drainage. Control grading to prevent water running into the excavated areas until the work is complete. Remove water that may interfere with the proper performance of the work or cause ponding.

E. QUALITY CONTROL

- The testing laboratory shall perform all tests and submit reports specified in this section. The testing laboratory shall be responsible for conducting and interpreting the tests; shall state in each report whether or not the test specimens comply with all the requirements of the Contract Documents and specify note the deviation therefrom.

- Testing Materials

  The testing laboratory shall perform all tests herein specified and additional tests as may be required.

  Optimum moisture-maximum density curve for each type of soil encountered in subgrades and fills under pave areas and bulking slabs. Determine maximum densities in accordance with ASTM D1157. Each type of borrow materials shall receive the following:

  a. Material Analysis : AASHT T88

  b. Plasticity index determination : AASHTO T90

  c. Moisture-density curve determination : ASTM D1557

- Testing and Subgrade and Fill Layers

  Subgrade and fill layers shall be approved before construction of any further works thereon. Test of sub-grades and fill layers shall be taken as follows:

  1. Footing subgrades: The design bearing capacities shall be verified by testing each strata of soil on which footings will be placed. The following tests shall be performed as required by the Construction Manager.

     Cohesionless soil, plates bearing test and filled density test.
     For cohesive soil, unconfirmed compression test.

- Paved area and Building Slab Subgrades : The top 12-inch of subgrade resulting from excavation shall have the maximum density of optimum moisture as specified. In fill area, each layer of fill shall meet the required density test of the subgrade for every 3000 ft. square of paved area or building slab but in no case less than three tests shall be made. In each compacted fill layer. Make one field density test for every overlaying 3000-ft. square of building slab or paved area, but in no case less than three tests. Field density tests shall be performed in accordance with ASTM D1556 at ASTM D2167.

- Foundation Wall Backfill at least three field density tests ASTM D1556 or ASTM D2167 shall be taken at locations and elevations as directed.

F. PREPARATION

- Clear and grub shrubs, roots, brush, vegetation, rubbish and debris within the construction limit lines, except as otherwise designated to remain or to be relocated.

G. EXCAVATION

- General

  Excavation to the lines and elevations are required. Excavation shall comprise and includes the satisfactory removal and disposal of all materials encountered regardless of the nature of the materials. Make excavations sufficiently large to permit placing and removal of forms, installation of weatherproofing, damp proofing and utilities and to permit inspection.

- Excavation for Footings

  Footing subgrades shall be approved before proceeding with construction of piers and footings shall be found on rock or firm understructure at elevations indicated or as shown. Refer to construction notes for required preparations. Subgrades of footings shall be level and free of loose rock, dirt, debris, and standing water prior to acceptance for placing concrete.

- Excavation for Paved Areas, Building Slabs and Structural Members in Cut Areas

  1. Structural Members: Structural members shall include frame slabs, grade beams utility tunnels.

  2. Subgrades: Subgrades shall be approved before proceeding with construction of structural members.

The top 12 inch of subgrade resulting from excavation shall be free from unsuitable material and have a minimum moisture when cohesive soil are tested in accordance with ASTM D2049.

If the subgrade thus meet the above requirements, compact the subgrade by rolling with suitable compaction equipment to obtain the density specified.

- Excavation for General Grading

  Excavations made below the elevations shown or specified shall be filled and compacted as hereinafter specified for filing and compacting.

- Excavation for Paved Areas, Building Slabs and Structural Members in fill Areas

  Subsection c applies except that no subgrade recompaction will be required.

H. FILLING AND COMPACTION

- Fill Materials

  Materials for fill and backfill shall be in general fill as herein before specified, obtained from the required excavation on site, if acceptable, or from burrow sources.

- Utilization or Excavated Materials

  Suitable excavated materials for fill and backfill as defined in clause 1 and 2 MATERIALS shall be approved. Materials which is suitable for use as fill under exterior slabs and

paving and backfill shall be separated form material which is only suitable for general grading.

- Burrow

  Provide additional materials, if required, at no additional cost. Acceptable burrow shall consist of suitable materials.

- Placing

  Place fill materials in horizontal loose layers in such manner as to produce a uniform thickness of materials. Placement shall start in the deepest area and progress approximately parallel to the finished grade. Thickness of layers before compaction shall not exceed 8 inches for cohesive soils. No fill material shall be placed on areas where free water is standing, or on surfaces which have not been approved.

- Compaction

  Compact each layer of fill with equipment to achieve 95 percent of maximum density at optimum moisture when cohesive soils are tested in accordance with ASTM D1557 or 75 percent of relative density when cohesionless soils are tested in accordance with ASTM D2040.

  In case of cohesive soil, do not compact materials when the moisture content varies more than 3 percent from the optimum moisture content. Maintain moisture content by wetting and drying manipulation. Suspend compaction operation because of rain and other unsatisfactory conditions.

- Gravel fill for Building Slabs

Provide completion of foundation walls and removal of forms. Clean the excavation of all trash and debris before application of damp proofing or waterproofing and placement of backfill as hereinafter specified for fill operations. Maintain symmetrical backfill loading and compact each layer by hand tampers or other unsatisfactory conditions.

- Do not backfill against foundation or basement walls until compaction or supporting floor construction to top of backfill or to first level above top of backfill. In placing backfill, take special care to prevent wedge action, eccentric or overloading of structure by equipment used in compacting backfill material, and to prevent damage to waterproofing or damp proofing on walls.
- Where subsoil drainage system are installed, place backfill so as to prevent any drainage to the system.

- Place drainage fill top of felt above footing subsoil drains to within 18 inches of finished grade, except as otherwise shown. Place and compaction as necessary to obtain the required densities under paved areas of general as specified herein.

CAST-IN-PLACE CONCRETE

A. SCOPE OF WORK

- Furnish all labor, materials, equipment, plant and other facilities the cast-in-place concrete as shown and hereinafter specified.

- All work under this division shall be subject to the General Conditions accompanying these specifications. The Contractor and Sub-Contractor for this portion of the work required are especially referred thereto.

B. APPLICABLE CODES AND STANDARDS

- The Standards and codes applicable to only a portion of the work specified in the section are referenced in the relevant parts of the clauses. Standards and codes, which are generally applicable to the work of this section, are listed hereinafter.

- American Concrete Institute

  Recommended Practice for Selecting Proportions for Normal Weight Concrete
  Recommended Practice for Evaluation of Compression Test Results of Field

  Specifications for Structural Concrete for Building

  Recommended Practice for Measuring and Placing Concrete

  Recommended Practice for Curing Concrete

  Recommended Practice for Consolidation of Concrete

  Building Code Requirements for Reinforcing Concrete.

- American Society for Testing and Materials

  Making and Curing Concrete Test Specimen in the Field

  Compressive Strength of Cylindrical Concrete Specimens

  Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.

  Ready Mixed Concrete

  Slump of Portland Cement Concrete

  Sheet Materials for Curing Concrete

  Fresh Concrete Sampling

  Liquid Membrane – Forming Compounds for Curing Concrete

  Chemical Admixtures for Concrete

  Concrete Made by Volumetric Batching and Continuous Mixing
  Sampling Aggregates
  Reporting Results of Analysis of Water
  Performed Expansion Joint Fillers for Concrete Paving and Structural Construction

  Wire – Cloth Sleeves for Testing Purposes

- Federal Specifications

  Concrete Patching and Leveling Compound

- C – E Corps of Engineers

  Requirements for water for use in Mixing or Curing Concrete
  Rubber Waterstops
  Polyvinylchloride Waterstops
  Expansive Grout

C. SUBMITTALS

- Layout of Proposed Placement

- Placement Schedule Proposed Construction Joint Layout and Sequence of Placement

- Proposed Curing Concrete

- Quality Assurance

  Proof of quality of manufacturer and reliability in field operations. Such proof shall normally constitute evidence that the product/equipment has been manufactured by them over a period of time and has established field service record. It shall include installation locations, dates and years of operating services. If there is no experience for an identical unit it may release to a similar unit by the same manufacturer.

- Samples

  Samples of any materials or product to be used in the works. They shall be properly marked and accompanied by a letter of transmittal clearly listing the samples, their intended use and locations in the work.

- Certificate of Compliance

  Certificate of Compliance shall include materials or Product manufacturer's Statement that the supplied items or systems to the specifications.

- Test Reports

  Shop test shall show the results of required shop test of materials, equipment or system certified in writing by the manufacturer or its representative.

  Field test reports shall show the results of required field test and compliance with approved procedures, certified by the Contractor.

D. TRANSPORTATION, HANDLING, STORAGE AND PROTECTION

- Cement and Admixtures

  Upon the delivery at site of work, cement and admixtures shall be stored separately in dry, weather tight, properly ventilated structure with adequate provision for prevention of absorption of moisture.

- Temperature Control

  The Contractor shall provide facilities and procedures to control or reduce the temperature of all materials used for concrete during hot weather; to such degree of temperature shall not exceed 90 degrees Fahrenheit.

  Concrete Removed from the Structure

  When the results of the strength test of the specimen indicate deficiency in specification requirements or where there is other evidence that the quality of the concrete is below specification requirements, core-boring tests shall be made in conformance with ASTM C42. If deficiency id discovered, the Contractor maybe allowed to make load test at his expense, and results shall be evaluated in conformance with ACI 318, Chapter 2.

- Slump

  Slump test shall be performed in the field under the supervision of the Construction Manager. Slump test shall conform to ASTM C143.

- Sample Concrete Panel

  Sample concrete panel for exposed or painted concrete shall be constructed and submitted for approval by the Construction Manager. The panel shall be not less than 6 ft. by 4 ft. in size. Sample panel shall be protected until acceptance of the complete concrete work. The approved sample shall be representative of the smooth texture concrete finish required in the work.

E. MATERIALS

- Portland Cement

  Only one brand of any type of cement shall be used for exposed concrete surfaces of any individual structure.

- Concrete Patching Compound

  PS SS – 1302, type 11, that can be painted without evidence of bleeding and that after final set will be unaffected by high humidity and moisture.

- Aggregates

  Grading requirements shall conform to ASTM C33. Coarse aggregates shall be well graded from fine to coarse within the prescribed limits of the Contract Documents.

- Fine Aggregates

  Fine aggregates shall consist of natural sand, manufactured sand or combination of the two and shall compose of clean, hard and durable spherical or curvical particles.

F. QUALITY CONTROL

- Samples and Testing

  Samples from stock on the site shall be taken by the Contractor in the presence of the construction Manager

  Cement

  The testing laboratory shall test sampled cement. Certify copies of laboratory of cement and shall include all test dates, and testing procedures are in conformance with stored more than four months after being tested shall be tested before use. Cement found unsatisfactory under test shall be immediately removed from the construction site.

  Aggregates

  Aggregates sampling shall conform to ASTM D75. Aggregates shall be sampled and submitted to the Construction manager for testing. No aggregate shall be used until test results are satisfactory to the construction Manager.

  Water

  Water analysis shall be performed in accordance with ASTM D596.

Admixtures

Sampling and testing of all admixtures used in concrete mix shall be in accordance with the standard procedure recommended by the testing laboratory. No admixtures shall be used if the test results are unsatisfactory.

- Concrete

During Place Concrete

The Contractor shall provide for test purposes three sets of the test specimens taken under the supervision of the Construction Manager from each 50 cu. m or fraction thereof for each class of concrete placed. At least one set of the test specimens for each classes of the concrete shall be provided in each eight-hour shift. Samples shall be secured in accordance with ASTM 172. Test specimens shall be made and cured in accordance with ASTM C39 or ACI 214. Test specimen shall be evaluated for each class of concrete specified in conformance with ACI 318, Chapter 4 Concrete Quality. Specimen may be tested 7 days to 28 days strength of the concrete is established.

Coarse Aggregates

Coarse Aggregates shall consist of crushed or uncrushed gravel, crushed stone, or a combination thereof and shall be clean, hard, and compacted particles of maximum nominal size ¾ inch. However, coarse aggregate of greater maximum size may be used provide the requirements of ACI 318, Sec. 3.3.3 are met.

- Water

Water for washing aggregated and for mixing and curing concrete shall be fresh and free from injurious amounts of oil, acid, slate, alkali, organic matter, or other deleterious substances as determined by CDCRD – C400. Chlorides and hardeners shall not exceed specified limits of ASTM D512.

- Admixtures

Admixtures containing chloride ions or other ions producing deleterious effect shall not be used.

- Vapor Barrier

Polyethylene sheeting conforming to ASTM E154 and mils thick minimum. Other similar materials having a vapor permanence rating not exceeding 0.5 per as determined by ASTM E96, procedure will be considered.

- Grout

Damp pack bedding grout mix of one part of Portland cement type 1 and ½ parts of the fine aggregates proportioned by weight and more than 4 – ½ gal. Of water per bag, 94 lb. Of cement.

Premixed, Non – Shrink Metallic Grout
“Masterflow” 713 manufactured by Master Builders, Euco – N.S. manufactured by Euclid Chemical Company or an approved equal.

Premixed Non – Shrink Metallic Grout
“Embecco 36” manufactured by Master Builders. Premixed manufactured by the Euclid Chemical Company or an approved equal.

Expansive Grout

CE CRD – C588, Type A or M, as required.

- Curing Materials

Impervious Sheeting

ASTM C171 type optional except that polyethylene sheeting shall be 4 minimum winds the imperious sheeting shall not be used.

Burlap

Cloth made of jute or kenaf shall conform to AASHTO M182 and shall weigh a minimum 0.06 Lb. Square foot.

Membrane Forming Compound

ASTM C309, Type 1. When non- pigmented compound is used, each shall contain a fugitive dye.

- Hardener

Floor hardener shall be a colorless aqueous solution containing not less than 20 lb. /gal. of zinc and or magnesium fluosilicate or sodium silicate solution having a specific gravity of 16.7 degrees Baume, “hornoligh” manufactured by A.C. Horn W.R. Grace “ Saniseal 50” manufactured by Master Builders, Lapidolite manufactured by Sonneborne Contech, or an approved equal.

- Joint Fillers

ASTM D1751 performed resilient bituminous type or ASTM D1752, performed sponge rubber.

- Joint Sealant

ASTM D1190, hot – pour type

- Water Stops

Metallic

Copper conforming to ASTM B370, 20-ounce weight or stainless steel conforming to ASTM 167, 0.037-inch nominal thickness and 6 inch wide.

Non-Metallic

CEO CRD –513 and CRD – 572, ¼ inches minimum thickness and 6 inches wide. Installation Joints – Shown and detailed on the plans

- Expansion Joints – As Shown and Detailed on the Plans

G. CLASSES, USAGE AND PROPORTIONING

- Concrete of the various classes indicated and as required under other section for different usage shall be proportioned and mixed by volumetric batching and continuous mixing in accordance with ASTM C685.

- Retarder Agents

Water reducing admixtures (plastic and retarder) maybe used subject to the approval of the Construction Manager.

- Trial Designed batches

  Trial designed batches for various classes required shall be the responsibility of the Contractor. Trial mixture having a proportion, consistencies and air contents suitable for the work shall be made based on ACI 211.1, using at least 3 different water cement rations which will produce a range of strength encompassing those required for the work. Trial mixtures shall be designed for maximum permitted slump and air content. The temperature of concrete in each content. The temperature of concrete in each trial batch shall be reported. For each water-cemented ratio at least three strength shall be determined by ACI 301, Chapter 3, and Paragraph 3.8 method 1 or 2.

- Slump

  Slump for vibrated concrete shall be minimum of 2 inch to a maximum of 4 inch as determined by ASTM C143.

H. BATCHING, MIXING, and TRANSPORTING CONCRETE

- Batch Plant

  The plant shall be semi-automatic type and of sufficient capacity not to impair the construction time schedule. The semi-automatic plant is a system where batching weights are set manually and materials are batched automatically.

  Site – Mixed Concrete

  Measuring tolerances, mixing capacity, and time shall be in accordance with ACI 301, Chapter 7, and paragraph 7.2.

- Truck Mixers

  When a truck is used to complete mixing of central plant batch of materials, all water shall be added at mixing speed before completing of mixing. Retempering of concrete will not be permitted. Each truck shall carry a ticket stamped by item clock to show date and time of the loading of each truck was completed.

I. PLACING CONCRETE

- Sequence of Concrete Placement

  To control shrinkage defects placement of concrete for floors shall follow a checker board pattern. Joints line shall cross within middle third of beams, girders, and short spans of slabs, unless otherwise allowed by Construction Manager. Contractor shall submit a construction joint layout and sequence of concrete placement for approval of Construction Manager.

- Preparation of Placing

  Excavation of forms shall be clean, free of debris of foreign materials. Reinforcement and embedded items shall be secured in position and shall be inspected and approved before placing concrete. Runways shall be provided for wheeled concrete handling equipment. Such equipment shall not be wheeled over reinforcement nor shall runways be supported on reinforcement.

- Placing Procedures

  Concrete shall be delivered from central plant of final deposit in a continuous manner in the time interval specified and without segregation or loss of ingredients. Placing shall be suspended when the sun, heat, wind, or limitation of facilities furnished by Contractor prevents proper finishing and curing of concrete. Concrete shall be placed in forms or excavations as close as possible in final position, in uniform approximately horizontal layers not over 12 inch deep unless otherwise directed. Concrete shall not be allowed to

drop freely more than 5 feet in unexposed work nor 3 feet in exposed work. For greater drop trunks or other approved means shall be employed. Conduits and pipes shall not be embedded in concrete unless specifically indicated or specified.

- Transformation Time Interval

  Concrete mixed in central plant and transported by non-agitating equipment shall be placed and transported in the forms in 60 minutes.

- Placing in Hot Weather

  Hot weather placing shall be in accordance with recommended practice of ACI 305, except that air temperature, reinforcement and form temperature exceeding 35 degrees C concreting shall be controlled as follows:

  1. Concrete temperature during mix, transporting and placing shall not exceed 32 degrees C otherwise approved by the Construction Manager.

  2. Reinforcing Steel and Forms shall be protected from direct sunrays and shall be cooled with water immediately before concrete placing so that concrete temperature specified can be maintained.

  3. When cold joints tends to form or where surface set and dry too rapidly or plastic shrinkage cracks tend to appear, concrete shall be kept moist by sprays applied shortly after placement and before finishing.

- Conveying Concrete

  Concrete may be conveyed by chute, conveyor, or pump if so approved by the Construction Manager. Aluminum chutes or pipelines shall not be used in conveying concrete. Approval will not be given for chutes or conveyors requiring changes in the concrete design mixed for desired operation.

  Chutes and Conveyors

  Chutes shall be steel or steel lined wood, rounded in cross section, rigid in construction protected from overflow and slopes not exceeding one vertical to three horizontals. Conveyors shall be designed to operate assuring uniform flow of concrete without segregation of ingredients, loss of mortar or change in slump.

  Pumps

  Placing concrete by pumping method shall confirm with ACI 304. Pumps shall be operated and maintained so that a continuous stream of concrete is delivered in the forms without air pockets, segregation or change in slump exceeding two inches.

- Placing Through Reinforcement

  Where congestion of steel or other condition make placing of concrete difficult, a trim pipe shall be used. Recommended placing and consolidation practices shall conform to that outline ACI 304 and ACI 309.

J. COMPACTION

- Immediately after placing each layer of concrete shall be compacted by internal concrete vibration supplemented by hand spanding, rodding and tamping or other external vibration of forms will not be permitted. Internal vibrators submerged in concrete shall maintain a minimum frequency of not less than 8000 vibration per minute. The vibrating equipment shall be adequate in quantity and capacity required and shall conform to the requirement of ACI 309.

K. BONDING

- Before depositing new concrete on or against concrete that has set, the surface of the set concrete shall be thoroughly cleaned so as to expose the coarse aggregate. Form shall retighten and all surface moisture.

L. SLABS ON GRADE

- Subgrade under slabs within the building shall be covered with vapor barrier. Edge shall be lapped by not less than 6 inches and seal a pressure sensitive tape not less than 2 inches wide, compatible with the membrane. Concrete shall be placed continuously so that each unit of operation will be monolithic in construction. Concrete shall be placed in alternate checkerboard pattern terminating at crack control joints or maybe limited by expansion and construction joints. Cracks control joints shall be expansion control, or construction joints.

- Control Joints

  Control Joints shall be performed by an insertion of hard pressed fiber guard strips inserted in plastic concrete. The joints shall be 1/8 inch wide and depth equal approximately ¼" of the slab thickness, unless otherwise indicated on the drawings.

- Sealing

  Concrete joints shall be filled with joint sealant except where floor covering is required.

M. SETTING OF BASE PLATE

- After being plumbed and properly positioned, base plates shall be provided with full bearing weight non-shrink grout except where expansive grout is indicated. The grout shall be packed by tamping or ramming with a bar or rod until voids are completely filled. For clearances of two inches or more than expansive grout shall be provided. Mixing and placing shall be in accordance with manufacturer's instructions. Grout shall not be retempered or subject to vibration. Temperature of the grout and the surface receiving the grout shall not exceed 32 degrees C.

N. CONCRETE FINISHES

- Floor and Roof Slabs

  Finish floors and roof slabs surfaces shall be through plane surface without deviation in excess of 8 inches when tested with a 10-foot straight edge. Surface shall be pitched as shown.

- Other Than Floor And Roof Slabs

  Within 12 hours after forms are removed, surface defects shall be prepared as specified hereinafter or as directed by the Construction Manager. Temperature of the concrete ambient air and mortar during repair work including curing shall not exceed 32 degrees C. Fine and loose materials shall be removed. Honeycombed, aggregate pockets, voids over ½ inch diameter and holes left by the reamed wetted, brush coated with neat cement grout and filled with mortar. Holes shall be packed full and all patchwork shall be damped cured for 7-day minimum.

  For surface, which is not to receive architectural finish; the following additional measures shall be taken.

  The concrete shall receive smooth finish by brush coating surface with cement grout composed by volume of one part Portland cement and not more than two parts fine aggregates passing number 30 mesh sieves and mixed with water to consistency of thick paint. Excess grout shall be scraped off with a trowel any visible grout film. The grout shall be kept damp by means of fog spray during setting period.

- Non-Slip Finish

  The concrete shall be screened and flatted to the required finish level with coarse aggregate visible. Abrasive aggregate shall be uniformly sprinkled over flattened surface at a rate recommended by the manufacturer. The surface then shall be steel trowelled to a smooth, even finish that is uniform in texture and appearance. Immediately after curing, cement coating or laitance covering the abrasive aggregate shall be removed by steel be removed by steel brushing, rubbing or light sand blasting to expose abrasive particles.

- Hardener

  Hardener shall be applied to expose interior concrete floor where indicated on the drawing and in accordance with the manufacturer's written installation.

- Curing

  Concrete shall be protected against moisture loss, rapid temperature changes, mechanical injury and injury from wind or flowing water for a period of time corresponding to cementing material used as follows:

  Portland Cement Type I …….. 7days

  1. Monolithic finish

     Slabs shall be screened and flattened with straight edge to bring the surface to the required finish level with coarse aggregates visible. The concrete while still green but sufficiently harder to bear a man's weight without deep imprint shall be wood trowelled to a smooth even dense finish free from blemishes including trowel marks. Rough surface shall be provided for resilient flooring thin – set ceramic tile carpeting where no other finish is specified.

  2. Power machine Finish (option)

     In lieu of hand finishing, an approved power-finishing machine may be used. The preparation of surface by machine shall be in general herein before specified for hand finish. Finish surface shall be free of machine marks, ridges or other blemishes.

  3. Rough Slab Finish

     Tamp the concrete to force the aggregate away from the surface, then screen with a straight edge to produce a uniform surface. Rough slab finish surface shall be provided for ceramic tile, floor toppings, and insulation built-up roofing of terrazzo.

  4. Broom Finish

     The concrete shall be screened and flatted to required finish level with coarse aggregate visible. While concrete is still green, steel or wood trowel to uneven smooth finish and then broom with fiber bristle brush in a direction transverse to that of the maintained traffic broom finish surface shall provide for drive – ways and ramps.

  5. Wood Float

     The preparation of surface shall be in general herein force specified for monolithic finish. While surface is still green, wood float to an even textured surface. Curing procedure shall conform to ACI 308 and ACI 305. During the specified curing period, the concrete shall be maintained in the moist condition and temperature not over 90 degrees F.

CONCRETE REINFORCEMENT

A. SCOPE OF WORK

- Furnish all equipment, labor, plant and other facilities to complete the concrete reinforcement as shown on the drawings and herein specified.

- All work included under this division shall be subject to the General Conditions accompanying these specifications. The Contractor and Sub-Contractor are required to refer especially thereto.

B. APPLICABLE CODES AND STANDARDS

- The Standards and codes applicable to only a portion of the work specified in this section are reference in the relevant parts of clauses. Standards and codes, which are generally applicable to the work of this section, are listed hereinafter.

- ACI American Concrete Institute

  Manual of Standard Practice for Detailing Reinforced Concrete Structures
  Building Code Requirements for Reinforced Concrete

- ASTM – American Society for Testing and Materials

  A185 Welded Steel Wire

  Fabric for Concrete Reinforcement

  A615 Deformed and Plain Billet – Steel Bars for Concrete Reinforcement

- CRSI – Concrete Reinforcing Steel Institute Manual of Standard Practice Placing Reinforcing Bars.

- AWS – American Welding Society Reinforcing Steel Welding Code

C. SUBMITTALS

- Details, Drawings and/or Shop Drawings

  Fabrication installation and assembly drawings for all parts of the work in sufficient detail to enable to check conformity with Contract requirements. Drawings shall show details and dimensions of all component parts including plan and elevation views, cross sections and details.

- Test Reports

  Shop test shall show the results of required test of materials, equipment or systems certified in writing by the manufacturer or its authorized representative.

  Field Test Reports shall show the results of required field test and compliance with the approved procedures, certified by the Contractor.

D. MATERIALS

- Bars: ASTM A615 Grade 60 and Grade 40, 40.

- Bar Mats: ASTM A184, of mesh and bar size indicated on the drawings

- Welded Fabric Wire: ASTM A4976, or mesh and bar size indicated on the drawings.

- Drawn Wire: ASTM A82
- Bar Supports: Comply with CRS – WCRSI " Manual of Standard Practice"

Interior concealed areas: Class A " Bright Basic"
Interior exposed Areas: Class C "Plastic Protected.
Exposed painted or concealed: Class D "Stainless Steel Protected"
Exterior unpainted or exposed: Class E "Special Stainless Protected"

E. DETAILING AND FABRICATION

- Reinforcement

  Provide concrete reinforcement, which is made from new billet steel and free from rust, dirt, oil and grease and any other foreign substances detrimental to bonding with concrete. Accurately bend or from fabricated bars to the shapes and dimensions shown using methods that will not damage materials. Do not weld unless specially shown or approved by the Construction Manager.

- Identification

  Bundle and tag reinforcement with suitable identification to facilitate sorting transportation to, or storage and placing at the job site.

F. PLACING REINFORCEMENT

- Reinforcement shall be installed as shown.

- Tolerances

  Maintain surfaces clearances dimensions shown, plus or minus ¼ inch. Secure reinforcement with accessories and tie wire to prevent displacement before and during concreting. Do not place concrete if bars are not properly placed with adequate support.

- Dowels

  Secure in position prior to placing concrete

G. SPLICES

- Lap-splices all bars up to 36 mm in accordance with ACI 318, unless otherwise shown. Follow AWS D12.1 recommendations for welded splices where shown.

H. REPAIR

- Remove and replace damaged bars as directed.

CONCRETE FRAMEWORK

A. SCOPE OF WORK

- Furnish all labor, materials, equipment, plant and other facilities to complete the concrete form work as shown and hereinafter specified.

- All work under this division shall be subject to general construction accompanying this specification. The Contractor and Sub-contractor for this portion of the work as required referring specifically thereto.

B. APPLICABLE CODES AND STANDARDS

- The standards and codes applicable to only portion of the work specified in this section are referenced in the relevant parts of clauses. Standards and codes, which are generally applicable to the work of this section, are listed hereinafter.
- ACI – American Concrete Institute

301 Specifications for Structural Concrete for Buildings

318 Building Code Requirements for Reinforced Concrete

347 Recommend Practice for Concrete Formworks (ANSI A 145.1)

- ANSI – American National Standards Institute, Inc.

  A199.1 Construction and Industrial Plywood

- Timber Design Standard – Philippine Association of Civil Engineers (PACE) CP 202, 1965.

C. SUBMITTALS

- Detail Drawings and Shop Drawings for all parts of the work in sufficient detail to enable the Construction Manager to Check conformity with the contract requirements. Drawings shall show the details.

D. QUALITY CONTROL

- Construction

  Construction formworks so that concretes surface comply with ACI 347, Chapter 2 and 3.

- Hydraulic Pressure

  The maximum allowable deflection of forming surface from concrete pressure is length/360 between supports.

E. MATERIALS

- Formworks Materials

  Unless otherwise shown form materials shall be one of the following:

  Plywood; ANSI A199.1 minimum—" in thickness

  Form Lumber

  Fiberglass reinforced plastic

  Steel

- Blockouts and keyways

  Wood or extended expanded polystyrene

- Ties

  Bolt or standard snap ties for snap off 1 inch from surface with minimum working capacity of 3,000 lbs. Maximum size cones shall be —" in diameter.

- Chamfer Strips

  Wood, polyvinyl chloride or neoprene

- Dovetail Anchor Slots

Standard size, 20 gauge galvanized steel with removable filler installed for abutting masonry and at 24 inch o. c. for facing masonry where shown.

- Flashing Reglets

  26 gauged galvanized sheet, with removable filler and beveled edges.

- Anchoring Inserts

  Approved propriety type inserts for the load capacity and use shown.

- Fabricated Embedments

  Install only as shown and as specified.

- Form Release

  Non-staining, non-reactive rust preventive guaranteed not to affect bond of surface application to concrete.

F. FABRICATION AND ERECTION

- Forms
  Design, construct, erect, support, brace, maintain and remove forms in conformance with the requirements of ACI318 part 1, 2 and 3 exclusive and ACI347 for loads lateral pressure and allowable stresses; in addition to other design parameters such as wind loads.

- Shores

  Shores shall be adjustable by screw jacks or wedges.
- Preparation of Forms

  Clean forms before each use. All steel forms shall be free of rust and scale.

- Form Re-use: The Number of reuses is dependent on the resulting finish quality and is subject to approval.

- Form Joints; Forms shall be butted types.

- External Corner: Chamfered unless noted.

- Cleanouts: Where required provide temporary openings panels in the forms to facilitate cleaning, placing and inspection.

- Cambers: Where specified camber is noted position the forms to maintain hardened concrete lines with specified tolerances measured for camber lines. Camber is to maintain as noted plus or minus 3mm (1/8 inch) until shoring is removed.

- Form Release: Coat removable forms with forms release agent before reinforcing is placed and in accordance with manufacturer's instruction. Remove release agents from reinforcing steel embedments solvents recommended by the manufacturer.

G. STRIPPING AND RESHORING

- General: Do not remove forms or shoring until the concrete members have acquired sufficient strength to support their weight and subsequent construction loads without defection. Forms shall be moved in a manner to assure safety of the structure.

- Time: Form and supports shall remain in place until the concrete has attained sufficient strength to support the loads to be applied but in no case shall they be stripped in less than the following minimum periods.

Columns	-	2 days
Walls	-	2 days
Sides of Beams and Girders	-	2 days
Floor Slabs	-	14 days
Shoring for Beams and Girders	-	14 days
Beam and Girders	-	14days

- Reshore: Reshore immediately after stripping slab, beams and girders that support subsequent formwork. Retain reshore for as many levels as required to combine the liveload capacities of cured floors to support the loads of the subsequent fresh construction loads. Reshore at minimum of two consecutive levels.

MASONRY WORK

A. SCOPE OF WORK

- Furnish all labor, materials, equipment, plant and other facilities and perform all operations on necessary to complete the Masonry Work requirements hereinafter specified.

- All work under this Division shall be subject to the General Conditions accompanying these specifications. The Contractor and Sub-Contractor for this portion of the work are required to refer specifically thereto.

B. MATERIALS

- Concrete Hollow Blocks: Shall be Machine Bilt, Non-Load Bearing (NLB) or approved equivalent. Minimum face shell thickness shall be 1” Nominal face 7” x 17” normal thickness shown. Hold all units in storage for a period of not less than 28 days (including curing period) and do not deliver prior to that time unless strength and other test indicate compliance with this specification.

- Mortar Aggregate: Natural river sand, clean free from soluble salts and organic matter, grades from fine to coarse, compatible with the thickness of joints in which used.

- Cement: Shall be Portland cement/Union Premium or approved equal.

- Mortar:

  General: Mix mortar from 3 to 5 minutes in such quantities as are needed for immediate use. No retampering will be permitted on mortar stiffness because of premature setting. Discard such materials, as well as those that have not been used within one hour after mixing.

  Proportioning: Cement mortar shall be one (1) part Portland Cement and two (2) parts sand by volume but not more than one (1) Portland cement and three (3) parts sand by volume.

C. HANDLING AND STRUCTURE

- Take care in handling masonry units to avoid chipping and breakage. Locate storage piles and stacks so as to avoid being disturbed. Barricade to protect from damage by construction operation. Stack masonry units, reinforcement and other materials on wood blocking above ground.

D. SCAFFOLDING

- Provide all scaffolding required for masonry work, including cleaning down on completion, remove.

E. SAMPLES AND TESTING

- Sample blocks shall be taken at random from every one thousand (1000) blocks delivered. Average strength of concrete hollow blocks shall not be less than 400 lbs. per square inch. Test shall be at the expense of the Contractor.

F. CUTTING AND PATCHING

- Consulting other trades in advance of masonry work and make provision for installation of their work to avoid unnecessary cutting and patching. Experienced masons shall do all cutting and patching.

G. HOLLOW METAL FRAMES

- Fill jamb of all pressed steel hollow frames occurring in masonry walls with mortar and carefully point all joints between metal frames and adjacent masonry and other construction.

H. WALL FLASHING

- Build in wall flashing at base of cavity wall formed to exclude water, bended in and covered with mortar. Keep joints to a minimum but where necessary, lap 6' and seal with plastic cement.

I. LAYING CONCRETE BLOCKS

- Lay units in common bond with uniform coursing and jointing. All concrete block joints shall be uniform thickness, approximately 3/8 tooled concave where exposed and flush cut where concealed, making 16' x 8' course. Butter vertical and horizontal joints full with mortar.

  Bond courses at corners and intersection and tie to abutting walls as per TRU-LOK Specifications.

  Reinforce concrete block walls continuously in two 2) consecutive courses below openings; using TRU-LOK shall be provided at every 16" of vertical wall height for load bearing walls. Lay units full thickness of partition from floor slabs to height shown, and where necessary cut.

GLASS AND GLAZING

A. SCOPE OF WORK

- Furnish all labor equipment, plant and other facilities required to complete all glazing work as shown in the drains and schedule and hereinafter specified.

- All work included under this division shall be subject to the General Conditions accompanying these specifications. The Contractor and the Sub-Contractor for this portion of the work is required to refer especially thereto.

B. GENERAL

- The type and the location of the glass are indicated. Determine the actual size by measuring the opening to be glazed, each piece of glass shall bear the Manufacturer's label giving his name and the quality, type and thickness of the glass. Do not remove label until final cleaning.

C. MATERIALS

- All glass for the aluminum storefront and drops shall be…" thick tinted polish plate glass as indicated in the schedule of windows and shall be those manufactured by the Republic Glass or approved equal.

- Size shall be those shown on the drawings.

D. SHOP DRAWINGS

- The Contractor shall furnish copies of the drawings showing dimensions and details and indicating all necessary items to the Architect for approval.

- Any correction required by the Architect shall be done immediately by the Contractor and corrected copies of drawings affected shall be returned to the Architect. The examination and approval of show drawings by the Architect shall not relieved the Contractor from any obligation to perform the work strictly in accordance with plans and specifications. The responsibility for errors in shop drawings shall remain with the Contractor.

E. INSTALLATION OF GLASS

- General: Employ only skilled labor. Set glass without springing, accurately fitted and carefully set using setting and spacer blocks in accordance with the recommendation of the glass manufacturer. Set all glass before final painting. Take every precaution to insure first-glass free from edge chips cracks or other defects and all glazing materials properly installed to meet approval.

- Examination of Surfaces: Before commencing the setting examines surfaces and report to the Architect in writing any defect in it. Commencement of work shall indicate the acceptance of the surface as satisfactory.

- Breakage: The Contractor shall be responsible for all glass broken because of faulty setting and shall be replaced at his expense.

- Expansion: Allow for expansion of glass as per manufacturer's recommendation.

F. GUARANTEE

- Furnish guarantee to Owner as per requirements of the General Conditions for the period of one year after date of final acceptance of building.

WATERPROOFING

1. SCOPE OF WORK

- Furnish all materials, equipment, labor, plant and other facilities to complete all waterproofing works as shown on the plans and hereinafter specified.

- All work included under this division shall be subject to the General Conditions accompanying these specifications. The Contractor and Sub-Contractor are required to refer especially thereto.

2. WATERPROOFING OF PARAPET AND ROOFDECK

- Materials

- Materials shall be Cold Applied Waterproofing or approved equivalent.

- Applications

  The concrete surface shall be wood troweled smooth, firm, dry, clean and free of loose or foreign materials and without any projects, indention and other imperfections. Cabinets shall be installed in the angle formed by the floor and adjoining vertical wall. All drainage connection shall be set to permit free flow of water.

On this concrete surface, apply 2 coats of Cold Applied Waterproofing to a roofdeck and vertical wall to a height of 10" (250mm) unless otherwise shown on the drawings surrounding the area to be waterproofed.

Sprinkler fine sand topping

Apply 2 base coats of Cold Applied Waterproofing and apply 2 topcoats of 2mm thick of Polyethylene sheet.

The installation of the waterproofing shall be done by an approved roofing contractor by the manufacturer.

No substitution of materials shall be made unless authorized in writing by the Architect prior to starting the work of waterproofing.

All materials composing the waterproofing underlayment shall be delivered into the job in unopened bags, pails and packages clearly labeled by the manufacturer's name.

- All the request of the Architect, the Contractor shall deliver to the Architect the following:

  Samples of the materials proposed for use as waterproof underlayment, clearly labeled as to brand name manufacturer's name.

  The manufacturer's complete printed specifications for the application of the materials.

C. FLOOR HARDENER

(For Transformer vaults room. Emergency Genset, Electrical Room, Pump Room and elevator machine room.)

- The concrete floor shall be monolithically finished with "Koradur" non-ferrous colored floor hardener in accordance with manufacturer's specifications for heavy-duty floor of 1.00 lbs. of "Korudur" per square foot of floor area. Colors to be approved by the Architect.

D. WATERPROOFING OF ALL EXTERIOR WALLS

- Materials

  Class B concrete
  Thoro-Seal White

- Application

  Pour all holes of exterior concrete hollow blocks with class B concrete (coarse, aggregates shall be of such size so that no voids are formed) with Thoro-Seal White of the type recommend by the manufacturer.

E. GUARANTEE

- The Contractor shall guarantee that work specified in this division shall be free from defects of materials and workmanship for period of five (5) years from the date of acceptance.

- The Contractor shall make good all damages or failures resulting from the use of defective materials and poor workmanship.

- The following failures will be considered as defective work.

  Leakage
  Peeling of waterproofing materials

Delaminating of plies
Air bubbles

- Approved Equal Brand
  Other approved equal brands shall be those that are representative by well-established firms to insure the period of guarantee.

HARDWARE

A. SCOPE OF WORK

- Furnish all labor equipment, and other facilities required to complete the installation of hardware as shown on the drawings and hereinafter specified.

- All work included under this division shall be subject to the General Conditions Accompanying these specifications. The Contractor and Sub-Contractor for this portion of the work are required to refer specifically thereto.

- The intent of the specifications is to cover the complete hardware requirements for this building, and any hardware called for in the specifications not shown on the drawings or vice versa shall be furnished the same as if it were shown on the drawings and called for in the specifications. Also any hardware which has been omitted from both drawings and specifications but is evidently necessary for complete building shall be finished the same as if it were shown on the drawings and called for in the specification.

B. GENERAL

- Determine the quality of hardware to be furnished from the drawings and schedules. Provide all complete finish hardware for doors and other movable parts of the building with exception of items specified elsewhere or not included.

- The hardware herein specified are given as a means of describing the type, materials, strength, design, quality, weight, mechanical constructions, operation and requirements to which such hardware shall conform.

- It is the responsibility of the contractor to thoroughly check the drawings and specifications and to furnish all required materials whether specifically mentioned or not.

C. FINISHING

- Hardware finishes specified are in accordance with U.S. Standard finishes flush bolts, push plates, pulls, and knobs and other finishing hardware shall be polished chromium plated over nickel or brass (US 26/625).

D. PROTECTION

- After hardware has been properly fitted exposed items such as door knobs, escutcheons, plates, locks, etc. shall be removed after final coat has been applied. All hardware unless to be painted over, that are not removed after painting shall be properly masked.

E. HARDWARE LOCATION

- Unless otherwise specified locate hardware as follows;
  Doorknobs shall be 39” from finished floor level to center knob.
  Push plates shall be 50” from finish floor level to center of push plate.
  Door pulls shall be 40” from finish floor level to grip center.
  Cylinder dead lock shall be 55” from finish floor level to center of lock.

- Butt Hinges : the number of butt hinges to be furnished for each door shall be determined as follows :

  For door 5’-0” high less, provide two (2) butts.

For door 5'-0" high less than 7'-0" high provide three (3) butts.
For doors over 7'-0"high unless otherwise required, provide additional one (1) butt for every 2'-0" or fraction thereof.

For metal doors, provide four (4) heavy duty hinges per cash. Butt hinges shall be 8" from top and bottom of door to center of hinges and the rest equally spaced.

F. HARDWARE SCHEDULE

- Refer to schedule on drawings

G. GUARANTEE

- Furnish guarantee to the owner as per requirements of the General Conditions for one year after date of final acceptance of building.

ROOFING WORKS

A. SCOPE OF WORK

- The work under this division shall include all labor equipment; plant and other facilities and the satisfactory performance of all work necessary to complete all the roofing works as shown on the drawings and hereinafter specified.

- All work included under this division shall include all labor equipment, plant and other facilities and the satisfactory performance of all work necessary to complete all the roofing works as shown on the drawings and hereinafter specified.

- All work included under this division shall be subject to the General Conditions accompanying this specifications. The Contractor and Sub-Contractor for this portion of the work are required to refer especially thereto.

B. ROOFING MATERIALS

- All roofing materials including accessories will be supplied by the Contractor.

C. INSTALLATION

- Lay roofing sheets as per manufacturer's recommendations with overlaps oriented following storm wind direction. Manufacturer's installation details.

- All roofing works shall be done by experienced tinsmiths known to the Contractor.

- Rat proofing works shall be in accordance with ordinances of the National Building Code and its Implementing Rules.

- All welded and solded connection in the roofing shall be painted by red lead paint then painted to match color of roofing sheets.

D. GUARANTEE

- Furnish guarantee to the owner as per requirements of the general conditions for period of one year after date of final acceptance.

PAINTING

A. SCOPE OF WORK

- Furnish all labor materials, equipment, plans and facilities to complete all painting and varnishing as shown and hereinafter specified.

- The Contractor shall examine the specification for the various other trades and shall thoroughly familiarize himself with the items and surfaces of work to be included.

- All work included under this division shall be subject to the General Conditions accompanying this specifications. The Contractor and Sub-Contractor for this portion of work are required to refer especially thereto.

B. GENERAL

- This work includes interior and exterior painting and finishing of all items as required to produce a finished painting job throughout all of the areas affected by work under this contract, except items which are specifically excluded.

- Complete color scheme for the painting of the building (exterior and interior) shall be furnished by the Architect to the Contractor. Color schemes samples required by these specifications and/or by the Architect shall be submitted by the Contractor for approval at his expense.

- All exposed work shall be protected while the building is being painted. The floor steps and all other surfaces not to be painted shall be well protected during painting by sufficient covers. Any stains, dirt, smear, etc. shall be removed by the Contractor to the satisfaction of the Architect.

C. SURFACES NOT TO BE PAINTED NOR VARNISHED

- Neither paint nor varnish shall be applied on finish like glazed tiles, glass, plastic, brass, bronze, aluminum and other corrosive metal finishes.

D. MATERIALS

- Make and Certificate of Origin and Quality

- All paint materials shall meet the requirements of the Standard Specifications of the Standardization Committee on Suppliers and shall be delivered on the site in the original containers, with label intact and seal unbroken.

- The manufacturer's certificate of origin and quality shall be submitted to the Architect for inspection and approval before using any of the paint materials herein specified.

- Use materials only as specified by manufacturer's direction on label of container unless otherwise specified herein.

- Paint materials only as specified by manufacturer's direction on label of container unless specified herein.

- Paint materials such as linseed oil, shellac, turpentine etc., shall be pure, higher quality and should bear identifying label on container.

- The use of white zinc (lithopone) shall not be allowed.
- Pigment for Tinting

- Tinting color for oil paint shall be color -in-oil, ground in pure linseed oil, and of the highest grade obtainable.

- Colors shall be non-fading.

- Color pigments shall be used to produce the exact shades of paint, which shall conform to the approved color scheme of the finish coat. The first coat shall be white.

E. INSPECTION OF SURFACES

- The Contractor shall inspect all surfaces to be painted and all defects shall be remedied before starting work. Commencing of work by the Contractor indicates his acceptance of the surface.

- No work shall be started unless the Contractor shall have made certain as to the dryness of surfaces. Tests shall be made, in the presence of the Architect or his representative, to verify dryness of surfaces to be painted.

F. PREPARATION OF SURFACE

- All concrete shall be allowed to weather for two months before painting.

- Clean all surfaces to be painted and varnished off loose dirt and dust before painting is started. Do the customary amount of sanding in the Architect's opinion to produce a surface suitable to receive paint or varnish.

- Inspect all surfaces with regards to their suitability to receive a finishing. In the event that imperfection due to materials of workmanship appear on any surfaces after the application of the paint the cost of any correction shall be borne by the Contractor. Damages to any painted or varnished finish due to carelessness or negligence of others shall be corrected.

- Touch all knots, pitch streaks and soppy spots with shellac or other approved sealer. Putty nail holes cracks, etc. after the first coat with non-shrinking putty of a color to match that of the finish.

- Wash all metal surfaces with benzene, mineral spirits, or detergent to remove any dirt or grease before applying materials. Where rust or scale is present, wire brush or sandpaper cleans before painting. Where shop coats of paint have become marred clean, and touch up with a compound designed for this purpose, or approved acid solution before applying the first coat of paint.

- Prepare masonry surfaces to be painted by removing all dirt, dust, oil and grease stain sand efflorescence. The method of surface preparation shall be left to the discretion of the Contractor provided that the result is satisfactory to the Architect. Masonry surfaces to be painted shall be free from alkali and thoroughly dry before paint is applied.

- Before applying succeeding coats, primers, and undercoats shall be completely integral and performing the function for which they are specified. Properly prepare and touch up all scratches, abrasions, or any other disfigurement and remove any foreign matter before proceeding with the following coat.

- Do not apply final coat on interior work until after others are finished with their work in any given area in normal sequence and all materials and debris removed, and the premises left in satisfactory broom clean condition as approved.

- Remove or protect hardware, hardware accessory plates, lighting, fixtures and similar items placed prior to paintings or remove protection upon completion of each space. Disconnect equipment adjacent to walls where necessary move to permit painting of all wall surfaces, and following completion of painting, replace and reconnect.

- Paint the backsides of access panels, removable or hinged covers and the like.

- All wood shall be sanded lightly with #00 Sandpaper between coats. Paint coats shall be thoroughly dry before sanding.

G. WORKMANSHIP

- All painting and varnish work shall be done in workmanlike manner by skilled house painter and varnisher only.

- All materials shall be evenly applied, so as to form a film of uniform thickness, free from sags, runs, crawls, or other defects. The use of heavy brush (nylon brushes for oil paints) is required. Light brushes shall not be permitted. Paint shall be thoroughly stirred so as to have the pigment evenly in suspension while paint is being applied.

- In general or unless otherwise specified, and/ or instructed by the Architect due to actual conditions on the job, no less than 48 hours time shall elapse between application of succeeding coats. Each of paint shall be allowed to dry thoroughly and inspected for approval before the succeeding coat is applied.

- No oil painting shall be done in damp weather.

- Except where otherwise noted or specified all paints shall be applied in three coats (priming body and finish coats). Each coat shall be roller applied (except as otherwise noted) spread evenly and in full covering body.

- No work shall be done in conditions unsuitable for the production of good results. No painting or varnishing on woodwork shall be done while plastering is in processor is drying.

- Surfaces which cannot be satisfactorily finished on the number of coats specified shall have additional coats or such preparation coats and subsequent coated as many as may required to produced satisfactory finished work without additional cost to the Owner.

- Spray gun application shall be used where indicated in the color schedule.

- All parts of molding and ornaments shall be left clean and true to details.

- All finishes shall be uniform as to sheen color and texture, except when glazing is required.

- The Painting Contractor since he is the last tradesman on the project shall include in his work all final clean up and washing of glass, spots on floors, hardware fixtures, etc.

H. PAINTING SCHEDULE

- The type of paint specified are intended to illustrate the quality and are taken from paint catalogue equivalent materials from manufacturers listed herein, which the Contractor desires to use other than those specified should accompany proposal with such request in writing for approval by the Architect. Give manufacturers name, specific name of each product offered as a substitute. After the award, no substitution of materials for those mentioned in the accepted proposal will be permitted. Other brands of paint and primer are the following: Dutch Boy; Sinclair; Sherwin Williams; Boysen; General Paint and Finch.

Exterior Concrete Walls

Cement Plaster over Concrete give:

- 1 Coat Concrete Primer
- 1 Coat Concrete Sealer
- 1 Coat Latex Flat Paint (Primer)
- 1 Coat Latex Flat Paint (Finishing)

Exterior and Interior Work

Metal steel doors, frames, railings, balusters, and grating give:

Coat Primer Paint
Coats Quick Drying Enamel

Apply one generous coat of “Raincheck “water repellant by spraying on all exposed non-painted concrete finish.

Interior work

- Plywood walls (painted) give: (Roller Painted)

  1 Coat flat wall enamel washable paint after which putty all over and sand smooth
  1 Coat interior Primer Sealer
  1 Coat paint (Flat Enamel Paint)
- Plywood ceiling give: (Roller Painted)

  1 Coat Flat Enamel Paint
  1 Coat Sealer
  1 Semigloss Enamel Paint

- Cement plaster and sunblasted finish over concrete and hollow concrete blocks, give:

  1 coat interior primer sealer
  coats Flat Wall enamel washable paints:

I. GUARANTEE

- The Contractor shall guarantee his work for a period of one (1) year from date of the acceptance. Under such guarantee, the Contractor shall make good any defect due to faulty materials or workmanship caused by him by without any additional cost to the Owner for the period specified.

WOOD AND PLASTICS

A. SCOPE OF WORK

- Furnish all materials and equipment and perform labor required to complete wooden framing and related rough carpentry work as indicated in the drawings and/or specified herein.

- Include in the works, nailing strips, scaffoldings, plates, straps, joists, hangers, rods, dowels, rough hardware, fasteners, and other miscellaneous iron and steel items pertinent to rough carpentry work.

B. STORAGE AND PROTECTION

- Stack framing lumber to insure against deformation and maintain proper ventilation.

- Protect Lumber from elements.

- Lumber in contact with concrete masonry shall be coated with two (2) coats of asphalt, applied hot.

- Temporary Protection

  Provide and maintain temporary protection of the work as required to safeguard completed or partially completed work during the progress.

  Provide all the necessary rough stairs, ladders, runways, for convenient access to all parts of the building until other permanent facilities are in place.

C. SCOPE OF WORK

- Lumber

Moisture content – not to exceed 18 percent

Grade and Trade Mark – required on each piece of lumber. All lumber including scaffoldings, conforming to 63 % stress grade lumber in accordance to the requirements of the National Structural Code of the Philippines, Volume 1, latest edition.

Refer to summary of Materials and Finishes

Substitution of Lumber

Any lumber equally good for the purpose intended may be substituted for kinds specified, provided however, that the substitution be authorized in writing by the Architect.

D. ROUGH HARDWARE AND METAL FASTENERS

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

- Execution

  Fit carefully mortise and tenon joists of all framing including tongues and grooves of sheathing. Anchor all frames coming in contact with concrete, unless otherwise specified, by means of 20 D nails, spaced not more than 0.20 m (8”) apart all around the contact surfaces. Plane and dress side of frames that will receive the wallboards or sidings.

  Wood nailers shall be in accordance with detail drawings or mentioned herein, nailing strips shall be 1” x 2” at 16 inches on centers both ways. Fasten securely by expansion bolts or other approved device at every (2) feet on center.

  Make all exposed nails countersunk. Do scrubbing, metering and joining accurately and neatly to conform to data

MILLWORK

A. SCOPE OF WORK

- Furnish materials and equipment and perform labor required to complete wooden jambs and doors and ceiling panels and related rough carpentry work indicated in the drawings and/or specified herein. Coordinate work with all other trades.

B. STORAGE AND PROTECTION

- Protect millwork against dampness during and after delivery.

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

C. PRODUCTS

- Lumber

  Kiln dried, selected, quarter sawn containing not more than 12 % moisture, free from imperfections impairing its strength, function and appearance with the same shade, color, grain configuration.

  Trademark is required in each piece of lumber.

- Plywood

  For interior plywood, use class B plywood whose species and thickness conform to schedule and drawings.

- Finish Hardware

D. EXECUTION

- Workmanship

  Make all wood finish and millwork true to details clean and sharply defined.

  Set panels to allow free movement in case of swelling shrinkage.

  Conceal means of fastening various parts together.

E. FINISH

- Mill fabricates and erects interior finish as indicated on the drawings. Machine sand at the mill and hand smooth at the job.
- Separate with ¼ inch stone-cut joints all interior trims set against concrete masonry or wood.
- Make joints tight and in a manner to conceal shrinkage. Secure trim with fine finishing nails, screws, or glue where required.
- Set nails for putty stopping.
- Make window and door trim single length.
- Meter molding at corner, cope at angles.

F. WOOD JAMBS

- Set doorframes plumb and level and brace until built-in.
- Anchor wood frames to masonry with approved metal anchors on each side of jamb. Place top and bottom anchors 8 inches from head to floor.

G. WOOD SHELVING

- Each shelf shall be supported on a continuous wood cleat at walls.
- Secure cleats to masonry walls be expansion bolt or approved fastening device.

H. HARDWARE

- Accurately fit and install all required finish hardware items.
- If surface-applied hardware is fitted and applied before painting, remove all such items, except butts, and reinstall after painting work is completed.

WOOD DOORS

A. SCOPE OF WORK

- Furnish all materials and equipment and perform labor required to complete flush doors / panel doors.

B. SAMPLES

- Submit sample corner sections of wood doors and jamb for approval of the Architect.

C. PROTECTION

- Protect door adequately from scratches, and other stains with heavy building appear

D. PRODUCTS

- Fabricates

  Assemble joints and doors with water resistant glue. Keep door under pressure until glue has thoroughly set.

  Sand smooth finish doors. Provide with joints and clean cured molding.

  Keep faces free from defects or machine marks that will show through the finish.

  Flush doors Hollow Core

  Provide doors with cross bending/solid section and edging. Make face veneer first quality-selected plywood or lawanit as indicated in the drawings or as specified herein.

E. EXECUTION

- Installation

  Cut, trim and fit each door to each frame and hardware accurately.

  Give allowance for painter's finish and possible swelling or shrinkage.

  Provide not more than 1/8-inch clearance at lock end hanging styles and not more than ¼ inch at bottom.

  Round all corners to 1/16-inch radius. Level slight lock and rail edge.

  All doors shall operate freely and all hardware shall be properly adjusted and functioning.

GLASS JALOUSIE / STEEL WINDOWS AND FRAMES

A. SCOPE OF WORK

- Unless otherwise specified, the Contractor or his Sub-Contractor shall furnish all materials, tools, equipment apparatus, transportation, labor, supervision, management, and incidentals necessary and required for the completion and satisfactory performance of work in strict accordance with this section of the specification and the applicable drawings, subject to the terms and conditions of the Contractor.

B. SHOP DRAWINGS AND SAMPLES

- The Contractor shall before proceeding with the manufacture/assembly glass jalousie/steel windows prepare and submit complete manufacturing and installation drawings in full size and in triplicate, together with samples of member, section and hardware to be used for the approval of the Architect. Windows to be manufactured shall conform to the approved drawings and samples.

- Submit shop drawings of metal windows for approval. The drawings shall show complete details of construction, anchorage and samples.

- Guarantee

All steel works shall be guaranteed for one year from final acceptance of the Owner and the Architect.

C. PRODUCTS

- All members shall be hot-rolled new billet steel with frame and ventilator section not less than 25mm deep from front to back. Frame members to be of equally designed section only at points where called for by the detail drawings and continuous angle pins, as indicated on drawings shall be furnished. For frame at sills, zee type section of special design. With offset permitting downtrend left of the vent member to set flush when vent is in a fully closed position shall be used. Ventilator member shall have integral weathering baffles providing double flat weathering contacts of not less than 6mm width on all four sides of the vent. Muntin shall be 22mm x 25mm rolled to a section.

D. EXECUTION

- Construction

- Corners of vent shall be metered, electrically butt-welded and ground smooth. Corners of frame and all other window, joints and intersection of muntin with frame and vent members shall be coped and electrically welded. Muntin bars except where ventilators are to be continuous from head to sill and from jamb to jamb. Muntin cross joints shall be rigidly and neatly interlocked with faces flushed. Frame section and vent sills shall have weep-holes to provide drainage. Continuous weather drips shall be provided where required at the heads for side hinges ventilators or door. Windows and doors shall be designed for glazing from the outside with wire glazing clips and steel casement putty. All units shall be prepared for and supplied with necessary standard hardware, and for screen plans or drawings.
- Mullions

  Rolled-steel T–bars, pipes, plate or other formed section or a combination of the as shown on drawings shall be furnished where two or more window units are installed in the same opening.

- Installation

  No window unit shall be allowed, in any case, to be installed in place in the formwork previous to pouring concrete. Instead, grooves for grouting shall be caused to be formed along the side and heads of wall openings as indicated on detail.

  Windows shall be erected and prepared openings by experienced window erection men. They be set plumb and true securely wedged and anchored as shown on detailed drawings and held in alignment during construction. All contacts between window and door wall units and adjacent steel including mullions shall be tightly sealed or bedded in mastic or approved sealing compound applied by the Contractor Ventilators shall be carefully adjusted before glazing.

  Standard anchors, clips, and mullions, bolts or screws shall be provided by the window manufacturer provided suitable sinkages and frames for all mortised or counter-sunk hardware and insert steel reinforcement drilled and tapped for attaching all hardware. Frames in masonry shall have steel adjustable anchors for each jamb, spaced approximately 0.60m on center. Provide special anchors for securing to concrete as detailed.
  Steel Doorframes or jambs formed to details shown with rebates to receive the doors. Make allowance of not more than 3mm clearance for doors. Neatly form all returns and edge. Frames shall be smooth and free from warp and buckle, the finish work shall be strong and rigid, neat in appearance and free from corners, and shall be reinforced and may be metered, their full length welded length and dressed of flush on the exposed surface. Meters shall be well formed and in true alignment. Set frames properly and braced against displacement during construction operation. During masonry work, grout the jambs solidly with masonry mortar. Protect all metal frames during construction.

- Field Painting

  Prior to or immediately after steel windows has been erected and before glazing, one coat of oil-based metal protective paint shall applied. A second coat shall be applied after putty has dried and set, not sooner than 3 weeks after glazing.

- Glass and Glazing

  Windows shall be glazed from the outside, using steel grade sash compound. Glass panels shall be bed-putted secured in place by copper-covered spring wire glazing clips furnished by the door manufacturer, and then face-puttees to a neat trim line. Glass shall be 6mm thick, clear, American or European made, unless other thickness is indicated on the drawings or as specified in the Schedule of Windows.

CEMENT FINISHES

A. SCOPE OF WORK

- Furnish materials and equipment and perform labor required to complete all plain cement, plaster finish.

- Samples

  Submit test panels for Architect's approval before execution of the work.

B. EXECUTION

- Plain cement plaster finish

  Provide all walls indicated with three coats of cement plasters (scratch coat, brown coat, finish coat). Mix each coat in the proportion of 1 part Portland Cement to Three parts sand by volume.

  Apply the scratch coat with sufficient materials and pressure to insure a good bond and then scratch to a rough surface. Provide a thickness of 3/8-inch scratch coat.

  Apply brown coat one day after applying scratch coat, with a thickness of 3/8 inch and level to a flat even surface. When stiff enough, trowel with a wooden float and cross hatch or broom lightly and evenly to secure a good mechanical bond for the finish coat. Wet the surface and keep from drying out for at least three days.

  Apply finish coat seven days after the application of brown coat. Provide thickness of 1/8 inch. Keep the finish coat damp but not saturated for a period of seven days.

CERAMIC TILEWORK

A. SCOPE OF WORK

- Furnish materials equipment and perform labor required to complete all types of tile works.

- Samples

- Submit samples of floor and wall tiles including all required beads and moldings.

B. EXECUTION

- Application of scratch coat.

Thoroughly dampen but not saturated, surfaces of masonry or concrete walls before applying the scratch coat. Make surface areas appear slightly damp. Allow no free water on the surface.

On masonry, first apply a thin coat with pressure, then bring it out sufficient to compensate for the major irregularities on the masonry surfaces to a thickness of not less than ¼ inch at any point.

Evenly rake scratch coats, but not dash coats, to provide good mechanical key for subsequent coats before the mortar applied by dashing until it has hardened.

On surfaces not sufficiently rough to provide good mechanical key, dash on the first coat with whisk brown or otherwise disturb mortar applied by dashing until it has hardened.

- Floor Tile Installation on Mortar Bed

  Before spreading the setting bed, establish lines of borders and center the field work in the both directions to permit the pattern to be laid with a minimum of cut tiles.

  Clean concrete sub-floor then moistens but not soaked. Afterwards, sprinkle dry cement over the surface and spread the mortar on the setting bed.

  Mix mortar and one part Portland Cement to three parts sand. Tamp to assure good cover the entire area and screened to provide a smooth and level bed at proper height and slope.

  Pitch floor to drains as required.

  After setting bed has set sufficiently to be worked over, sprinkle dry cement over the surface and lay tile.

  Keep tile joints parallel and straight over the entire area by using straight edge.

  Tamp the tiles solidly onto the bed using wood blocks of size to ensure solid bedding free from depressions.

  Lay tiles from centerlines outward and make adjustment at walls.

- Wall the installation on mortar bed.

  Before application of mortar bed, dampen the surface of the scratch coat evenly to obtain uniform suction.

  Use temporary or spot grounds to control the thickness of the mortar bed. Fill out the mortar bed even with grounds and rod it to a true plane.

  Apply the mortar bed over an area no greater than can be covered with tile while the coat is still plastic.

  Allow no single application of mortar to be ¼ inch thick.

  Completely immerse wall tiles in clean water and soak of at least ½ hour. After removal, stack tiles on edge long enough to drain off excess water. Re-soak and drain individual tiles that dry along edges.

  Apply a bond coat 1/32 – 1/16 inches which to the plastic setting bed or to the back of each sheet or tile.

  Press tiles firmly into the bed and beat into place within one hour.

  Lay tile fields in rectangular block areas not exceeding 25 by 25 inches.

- Grouting

After tile has sufficiently set, force a maximum of grout into joints by trowel, brush or finger application
.
Before grout sets, strike or tool the joints of cushion-edgetile to the depth of the cushion

Fill all joints of square-edged tile flush with the surface of the tile. Fill all gaps and slips.

During grouting, clean all excess grout off with clean burdock, cloth or sponge.

- Cleaning

  Sponge and wash tile thoroughly with clean water after the grout had stiffened. Then clean by rubbing with damp cloth or sponge and polish

  Clean with dry cloth.

RESILIENT TILE FLOORING

A. SCOPE OF WORK

- Summary

  The General Conditions apply to all work under this section of the specification.

- Unless otherwise specified, the Contractor shall furnish all materials, tool, equipment, apparatus, appliances, transportation, labor, supervision, management and incidentals necessary and required for the completion and satisfactory performance of work in strict accordance with this section of the Specifications and the applicable drawings, subject to terms and conditions of the Contractor.

B. PRODUCTS

- Vinyl Tiles

  Details and color schemes to be determined by Architect.

- Tile Adhesive

  As manufacturer's specifications.

- Floor Divider Strips

  Heavy top strips, brass ¼ inch top thickness with an offset or projection below the top of the strip and extending it from one side.

C. EXECUTION

- Preparation of surface

  Clean the floor thoroughly of all dirt, grease, paint drops, etc. leaving a surface suitable for the installation of the vinyl tile the resulting concrete surface therefore, shall be smooth, even thoroughly dry and clean, before a layer of the manufacturer's adhesive is laid to receive the tile in accordance with the manufacturer's primer.
  If the Engineer so requires, because of the concrete surface conditions, the manufacturer's primer shall prime the concrete surface.

- Laying Vinyl Tile Workmanship

  The Vinyl Tiles shall be laid according to details and color scheme approved by the consulting Architect and shall be carefully matched and the seams cut. All seams and edges shall be cemented carefully smug fit with the manufacturer's adhesive for the

purpose. The surface of the finish floor shall be left smooth, clean and in first class condition.

Only experienced men shall be employed in this work.

All borders shall follow the line of the permanent fixtures and the width of the border may vary to allow for variations in the dimensions of rooms, size of tiles and design selected. The tiles shall but against the base floor level. Approved metal moldings shall be provided at door openings and such points where so required.
Do not begin work until work of other trades including painting has been completed.

- Floor divider metal

  Floor divider strips (heavy top strip), ¼ inch thickness with an offset or projection below the top of the strip and extending from it on one side, shall be laid straight and true between Vinyl Tile flooring and other floor finishes like cement, terrazzo, granolithic, tile, etc. This projection provides a bearing surface for a vinyl tile and brass strips to the flush. Where jointing occur at door openings, strips shall be set directly under center of doors.

- Cleaning, Waxing, and Polishing

  At completion of the work, the Contractor shall clean all Vinyl Tile works, remove all cement dirt or other foreign substances.

  Apply two coats of water emulsion wax and polish each coat to produce a well-polished finish.

  Do not permit traffic on finished floors unless they are protected with heavy papers.

- Adjustments

  The installation shall be thoroughly inspected and all necessary adjustment shall be made within one-month time.

  Tiles that have not “seated” in level glance with surrounding tiles shall have heat applied locally or quickly rolled to surrounding floor tile level. Repair tile showing minor fracture, shall have heat locally applied and then quickly rolled.

  Tiles showing broken corners or fracture line entirely across their surface shall be warmed and then removed. Substitute new tile of same color and thickness.

WROUGHT IRON GRILLES

A. SCOPE OF WORK

- Furnish all labor materials, equipment, plant and other facilities necessary for fabrication, delivery and installation of all security grill work shown on drawings and as herein specified.

- All work under this division shall be subject to the General Conditions accompanying these specifications. The Contractor and the Sub-Contractor for this portion of the work is required to refer thereto.

B. GENERAL

- The Contractor shall furnish and installs all wrought iron grillwork indicated on the drawings or specified herein.

C. FABRICATION

- All work is to be first quality, by experienced craftsman and fabricated in a shop capable of producing the higher grade of metal work and whose principal business is the manufacturer of architectural metals.

- All joints and splices shall be electrically welded and ground smooth.

- Before delivery to the job site, all wrought iron grille work shall be shop painted with a coat of rust inhibitive primer such as red lead.

- All seams shall be ground smooth.

D. INSTALLATION

- All work shall rigidly install in a first class manner done by experienced mechanics.

E. GUARANTEE

- Furnish guarantee to Owner per requirements of the General Conditions for period of one year after date of final acceptance of building.

SPECIFICATIONS FOR STRUCTURAL WORKS

Working Drawings

- This "General Notes & Specifications for Structural Works" shall form a part of the Structural Plans.
- In the interpretation of these structural plans, indicated dimensions shall govern and distances or sizes shall not be scaled for construction purposes.
- In cases of conflict in details or dimensions between the Architectural and Structural Plans, refer to the Engineer or his authorized representative for final decision.
- In cases of conflict between the Structural Plans and the General Notes and Specifications, the Plans shall govern.

A. DESIGN LOADS

- Dead Loads

The design loads unless otherwise specified in the structural plans are as follows:

Concrete	150 pcf
Partitions (As reflected on plan)	20 psf (minimum)
Concrete Topping	25 psf
Ceiling Utilities/Mechanical/Electrical/ Plumbing	5 psf

The Architect and building contractor shall get the approval of the Structural Engineer for any loading different from exceeding these loads.

The Concrete Hollow Block partition and R.C. walls as indicated in the structural plans. Additional CHB and R.C. walls shall be subject to the approval of the Structural Engineer.

- Live Loads

The design live loads unless otherwise specified in the plans are 50 psf:

Classrooms	40 psf
Corridor / Stair	100 psf
Roof	20 psf

These design live loads shall never be exceeded at any time during the life of the structure without the written consent of the Structural engineer.

It shall be the responsibility of the Owner of the building to get the approval of the Structural Engineer of any live load that will be imposed on any area of the building different from and or exceeding the design live loads specified herein.

No portion of the building shall be used as temporary storage of construction materials in excess of the design live loads with the consent of the Structural Engineer.

- Earthquake Loads

  The design earthquake loads are as per the provision of the "Uniform Building Code (USA) 1994 Edition" for Earthquake Zone 4. These loads are assumed to be statically applied to the structure.

- Wind Loads

  The design wind loads are as per the provision of the "National Structural Code for Building (PHIL) 2001"

- Equipment Loading

  Equipment not indicated in the plans shall be not installed without the approval of the Structural Engineer.

  The manufacturer shall submit equipment data specifying the weight, and its reaction at the base, and its vibration characteristics.

B. REINFORCED CONCRETE CONSTRUCTION

- Cement shall conform to Portland Cement ASTM C150.

- Concrete aggregates shall conform to ASTM C33 except the aggregates failing to meet these specifications but which have produced concrete of adequate strength and durability may be used to the approval of the Structural Engineer.

- Water used in mixing concrete shall be clean and free from injurious amounts of oil, acids, alkalis, salts, organic material or other substances deleterious to concrete or steel. In addition, the mixing water for pre-stressed concrete shall not contain deleterious amounts of chloride ion.

- Reinforcing bars shall conform to ASTM A615.

- Admixtures to be used in concrete shall be subject to prior approval by the Structural Engineer.

- Cement and aggregates shall be stored in such a manner as to prevent their deterioration or the intrusion of foreign matter.

  Concrete cylinder samples for strength tests of each glass of concrete shall be taken not less than twice a day nor less than once for each 50 cum. of concrete or for each 490 sq.m. of surface area place. The cylinder samples for strength tests shall be taken cured and tested in accordance with ASTM C172, ASTM C31, and ASTM C39.

- Acceptance of Concrete

  Concrete poured will be considered satisfactory if the average of all sets of these consecutive strength test falls below the required fc' and not individual strength test falls below the required fc' by more than 500 psi.

- Core tests and load tests

If individual tests of laboratory cured cylinder samples produced strength more than 500 psi below fc' core test and or load tests may be resorted subject to the approval by the Structural Engineer.

- Mixing of Concrete

  All concrete shall be mixed until there is a uniform distribution of the materials and shall be discharged completely before the mixer is recharged.

- Conveying of Concrete

  Concrete shall be conveyed from the mixer to the place of final deposit by methods that will prevent the separation or loss of materials.

- Depositing of Concrete

  Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to re handling or flowing.

- Curing

  Concrete shall be maintained in a moist condition for at least 7 days after placing. Wet burlap may be laid over the slab constantly applied with water.

C. CONCRETE MIXES

Unless otherwise indicated in the drawings, the minimum 28-day cylinder compressive strength shall be as follows:

a) Foundation ---------- fc' = 3000 psi
b) Columns ---------- fc' = 3000 psi
c) Slab on Fill ---------- fc' = 3000 psi
d) Suspended beam & Slab ---------- fc' = 3000 psi
e) All others ---------- fc' = 2000 psi

D. FOOTINGS

- Assumed allowable soil bearing capacity, in the absence of soil investigation report, is 2000 psf. The Contractor shall verify actual soil condition at site.

- Existing underground pipes, tunnels, etc., shall be brought to the attention of the Structural Engineer for evaluation.

- An excavation adjacent to an existing structure shall be provided with adequate sheet piling by the Contractor. The sheet piles shall be properly designed to resist earth and water pressure as well as surcharge loading on the footings of the adjacent existing structures.

- Unless otherwise detailed in the plans CHB wall footing shall be as per figures on Sheet SS-1.

- RC Slab on fill other than pressure slab @ basement shall be .125m thick with 10-mm bars at 0.30 m.o.c. each way unless otherwise indicated in the plans.
- All earth fill supporting ground slabs for flooring, parking, sidewalk, etc., shall be compacted to 90% proctor in layers of 0.30m. Unless otherwise specified by the Structural Engineer.

E. REINFORCED CONCRETE BEAMS

- Unless otherwise noted in the plans or specifications camber all RC beams at least 6 mm (1/4") for every 4500mm (15') of clear span except cantilevers which shall be 19mm (3/4") for every 3000 mm (10') of clear span.

- If there are two or more layers of reinforcing bars, use 25-mm separators spaced at 0.90 m.o.c. In no case shall there be less than two separators between layers of bars.

- If beam reinforcing bars end in a wall, the clear distance for the bar to the farther face of the wall shall be not less than 5 bar diameters. The reinforcing bar shall terminate on a standard 90 degrees hook.

- Beam reinforcing bars supporting slab reinforcement shall be 25 mm from the bottom of the finish.

- When a beam crosses a girder, rest beam bars on top of the girder bars. At column intersection girder bars shall be on top of beam bars.

- Lengths of bar cut off and bar clearances shall be as specified in Sheet S-1.

- Top bar splices shall be located at mid-span and bottom bar splices at column supports. Unless otherwise indicated in the plans splice lengths shall follow those given for development length as per figure on Sheet S-1.

F. REINFORCED CONCRETE SLABS

- Unless otherwise noted in plans or specifications, camber all R.C. slabs 3mm (1/8") per 3000 mm (10') of shorter span.

- If slabs are reinforced both ways, bar along the shorter span shall be placed below those along the long span at the center and over the longer span bars near the supports.

- Lengths of bar cut off shall be as specified in Sheet SS-1.

- Concrete covering shall be 18 mm for top and bottom bars.

- Unless otherwise specified by the Engineer, bar chairs shall be provided at least 600 mm. each way to support top and bottom bars separately.

G. REINFORCED CONCRETE COLUMNS

- Unless otherwise indicated, the column pedestal embedded in the ground shall be 50 mm. larger than the column as per plan at the basement floor level, or ground floor level if there is no basement.

- Construction joints in columns shall be located at the top of the pedestal (basement floor line, or ground floor line if there is no basement) or at least a distance above the floor equal to the maximum dimension of the column or 1/6 story height.

- All ties shall be fastened to column vertical reinforcement by means of wires at all intersection portions of ties and columns rebar.

- Not more than one-half (1/2) of the total number of bars shall be spliced at the same level. The lap be 1.3 ld of the bar development length. Splices shall be staggered at a distance of at least 40 bar diameters.

- Column bar splice lengths shall follow those tabulated for development on Sheet SS-1.

- Lap welded splice maybe used ion lieu of the above. The capacity of the weld provided shall be 125% larger than the tensile capacity of the bigger bar being spliced. No butt-welded splices are allowed unless otherwise permitted by the Structural Engineer.

- Confinement ties shall be provided on all columns at beam column intersections as shown in S-1.

H. REINFORCED CONCRETE WALLS

- Unless otherwise indicated in the plans, the R.C. wall horizontal bars shall be inside the vertical bars – (retaining wall).

- Reinforcing bars shall have at least 30mm concrete clearance except in 100-mm wall or less where they shall be at the center.

- Carry vertical bar 600 mm above floor level to provided for splices when necessary. Elsewhere stop at 50 mm. below the top of the slab, the bar shall terminate on a standard 90-degree hook.

- Horizontal and vertical bars conforming to ASTM A615 shall have a minimum splice lapping and wired with No. 16 G.I. wire provided that splices in adjacent bars are staggered at least 1.50 m.o.c. Not more than one-half (1/2) of the total number of bars shall be spliced at the same line. Splices shall be staggered a distance of at least 40 bar diameters.

- All opening on walls or slabs less than 300mm thick shall be reinforced as per Figure on Sheet SS-1.

- At wall intersections and corners, the anchorage length provided shall be as shown on Figure on SS-1.

I. C.H.B. WALLS

- Unless otherwise specified, the vertical and horizontal reinforcements for CHB shall be as indicated in the standard details.

- Lintel beams to be used shall be (t x 0.20m.) reinforced by 4-12 mm bars with 10 mm at 300 mm o.c. ties where “t” is the CHB wall thickness.

- Lintel beam shall be provided at top of CHB wall openings. It shall extend at least 200mm beyond the openings.

- For high walls, lintel beams shall be provided at 3000mm o.c.

- For long walls, stiffener columns shall be provided at 3000mm o.c.

- Where CHB walls adjoin R.C. Columns and beams, provide dowels on R.C. column and beams prior to pouring to match CHB wall reinforcement. The dowels shall be 12mm bars at 600 mm. o.c.

- Where columns and beams have been poured without the CHB wall dowels, provided ½” dia bolts at 400mm o.c. These anchors shall be drilled and grouted w/ conc. Epoxy. No chipping off of concrete columns and beams is allowed unless permitted by the Engineer.

J. STRUCTURAL TOLERANCES

Unless otherwise specified by the Engineer, the following are the acceptable structural tolerances for cast-in-place concrete construction. All dimensions, which are not within the required tolerances, shall be corrected prior to pouring of concrete. Tolerances for pre-cast concrete construction shall be ½ of the values given below:

a) Cross sectional dimensions and location of reinforcement, pre-stressing steel and pre-stressing steel ducts.

Dimensions less than 200 mm	-	+ 6mm
200mm to 600 mm	-	+ 9mm

	Over 600mm	-	+12mm
b)	Member lengths or height (Max. limitation = 12mm)	-	6mm per 3.0 meters
c)	Deviation from straight line (Sweep and or plumpness)	-	6mm per 3.0 meters
d)	Locations of bar cut-off or bonds	-	+50mm

K. CONCRETE PROTECTIONS FOR REINFORCEMENT

The following minimum concrete cover shall be provided for reinforcing bars. For bar bundles, the minimum cover shall equal the equivalent diameter of the bundled bars needed but not be more than 2 inches on the tabulated minimum whichever is greater.

- Cast-in-place concrete (pre-stressed concrete construction)

a)	Cast against and permanently Exposed to earth	75 mm
b)	Exposed to earth or weather 20mm dia. and larger	50 mm
c)	Not exposed to weather or in contact with ground, Slabs walls and joints.	
	36 mm dia. and smaller	19mm
	No. 14 and No. 18	38mm
	Beams, girders and columns Principal reinforcements, ties Stirrups or spirals	38mm

L. REINFORCING BARS

- All reinforcing bars shall be deformed conforming to ASTM A615-68 unless otherwise noted in the plans the minimum yield strength of the reinforcing bars to be used corresponding to the structural member shall be as enumerated below:

  a) fy = 33,000 psi for 12mm & smaller sizes
  b) fy = 40,000 psi for 16mm & larger sizes

- Splice and anchorage lengths requirements follow those set for development length (ld) as shown in SS-1 unless otherwise indicated in the plans or approved by the Structural Engineer.

- Equivalent metric size bars when used shall be as per tabulations below:

No. 3	10mm∅
No. 4	12mm∅
No. 5	16mm∅
No. 6	20mm∅
No. 8	25mm∅
No. 9	28mm∅
No. 10	32mm∅
No. 11	36mm∅

M. STANDARD HOOK

- A standard hook for rebars if required shall be either of the following:

  A semicircular turn plus an extension of at least 4-bar diameter but not less than 62mm at the free end of the bar.

  A 90-degree turn plus an extension of at least 12 bars diameter at the free end of the bar.

- Minimum diameter of bend measured on the inside of the bar shall be as follows :

10mm∅ to 25mm∅	- 6 bar diameter
28mm∅ to 36mm∅	- 8 bar diameter
No.14 to 18	- 10 bar diameter

N. WELDED SPLICES

- Lap welded splices when used shall develop a resistance equal to at least 125 percent of the tensile capacity of the bar being spliced.

- Butt-welded splice when used shall be considered 75% efficient. The remaining 50% capacity to develop 125 percent of the tensile capacity of the bar shall be provided for by an additional welded lap splice connection on the same joint.

- The Contractor for approval shall submit details of all welded splices by the Structural Engineer.

- Only certified welders shall be allowed to perform welding operations. These welders shall be subject to the approval of the Work Engineers.

- Testing of welds shall be by X-ray Method (non-destructive tests) unless otherwise directed by the Structural Engineer.

- Connection of crossing bars by track welding is not permitted.

PLUMBING WORKS

A. GENERAL

- **Scope of Work**

  The work to be undertaken in this Division shall consist of the furnishing of all materials, labor, tools, equipment and other facilities and equipment and the satisfactory performance of all work necessary of complete installation, testing and operation of the plumbing system in accordance with the applicable consisting of, but not necessarily limited to the following :

  Water distribution and supply pipes to equipment and plumbing fixtures.

  Install storm drainage system which include canopy drain, roof downspout, junction boxes and connection to storm drain or to open channel or to on the low ground.

  Provide oil, waste and vent pipes system and connection to septic tank and connection of outlet waste line to nearest existing storm drain.

  Install plumbing fixtures, fittings, trims and accessories for the toilets.

  Leakage tests of water supplies, sanitary and storm drainage system.

  Pressure test of newly installed water system.

  Disinfecting of water distribution system.
  Submit certificate of test on installed equipment and piping system.

  Secure all permits and licenses as required.

  Prepare and submit reproducible Final As-built plans and (4) set of white prints signed and sealed by Registered Sanitary Engineer or Master Plumber.

  Furnish a written one-year warranty on the plumbing and equipment installation.

Investigate and coordinate with other trades of all possible conflicts of plumbing works with others.

- Coordinate With Other Trades

  The Contractor is required to refer to the General Conditions and to all architectural, structural, electrical and mechanical plans and specifications and shall investigate all possible interference and conditions affecting this work.

- Responsibility

  The contractor and all persons or Companies providing or both for this project are specially referred to the General Conditions of the Specifications and the various other contract documents, which may affect the completion of any work of the other trades. In the absence of complete agreement among the Sub-contractors of the General Contractor (Authorized by the Owner), supply dealers, or others affected by the construction, the General Contractor is to be held responsible for the Coordination and completion of all the works.

- Drawings and Specification

  The General Drawings and these Specifications are complementary to each other and any labor or materials whether called for or both if necessary for the successful operation of any particular type of fixtures or equipment specified under this contract shall be furnished and installed without additional cost to the Owner.

- Intent

  It is not intended that the drawings shall show every pipe, fitting, valve and appliance. All such items, whether specifically mentioned or not, or indicated on drawings, shall be furnished and installed necessary to complete the system in accordance with the best practice of the plumbing trade and to the satisfaction of the Owner/Architect.

- Permits and Inspection

  The Contractor shall obtain and pay for all permits bonds and inspection fees and shall be responsible for all penalties incurred by himself or his agents.

- Workmanship

  All works shall be performed in first class and neat workmanship by plumbers and their work shall be satisfactory to the Architect and to the Owner.

- Code to be followed

  All plumbing work to be done shall be in accordance with the National Plumbing Code of the Philippines and with the requirements of all applicable laws of the Republic and all local codes and ordinances.

B. MATERIALS

- Approved Materials

  Within 30 days after the award of contract, the Contractor shall submit for the Owner's Representative approval, four (4) copies of all equipment and materials he proposes to use under this contract.

After written approval of the above list, and before purchase of any equipment or material, the Contractor shall submit for approval four (4) complete sets of detailed information consisting of manufacturer's bulletins, shop drawings and part list of equipment and the materials to be provided under this contract.

The Contractor shall assume the cost of and the entire responsibility for any change in the work as shown on the Contract, which maybe occasioned by approval of materials other than specified.

- Standard for Materials

All materials shall conform to the standard listed below:
Centrifugal cast iron pipe - ANSI A21.6
Cast iron soil pipe fitting - ANSI A21.6
Black Iron Pipe - ASTM a 53 Standard, Schedule 40
Malleable Iron Fittings - ASTM A – 338
PVC pipe and fittings - ASTM - D 1784, CS 256 for water
Pressure pipes, sanitary II, Series 1000 for waste and vent pipes.
Union patent (malleable iron, for ferrous pipes): U.S. Federal Specifications
WW U – 531. Type B Zinc – coated.
Non-reinforced concrete sewer, storm drain and culvert pipe - ASTM C–14-82
Galvanized Iron Pipe - ASTM A – 53, Schedule 40
Reinforced concrete culvert, storm drain and sewer pipe - ASTM C 76-84
Cement - ASTM C150 – 86 Type I
Deformed reinforcement bar - ASTM A496

- Alternate Materials

Use of any materials, device, fixtures and appurtenances not specified in these specifications maybe allowed, provided that such alternate item has been approved in writing by the Owner's Representative and Contractors claim for its suitability. The cost for testing shall be paid for by the Contractor.

Test shall be done by any agency approved by the Owner's Representative and in accordance with generally accepted standards. In the absence of such standards, the Owner's Representative may specify the test procedure.

To any substitution, all health and safety requirements shall be observed.

The Contractor shall, together with his bid, submit a list of materials which he intends to use in list of the materials specified in the contract documents which he believes he cannot supply and stating the reason for the substitution. Material shown in this list shall be installed as specified and no further request for substitution shall be made except when he can show a valid reason.

Request for substitution shall be accompanied by:

- Reason for substitution;
- Certificate of test indicating quality of substitute materials;
- Cost comparison with materials originally specified.

- Identification of materials

Each length pipe, each fitting, trap, fixture and device used in the plumbing and piping system shall be cast, stamped or indelibly marked on name, the weight, the type, the class of product when as required but the standard mentioned in the Sub-section 2.2 mentioned above.
All plumbing fixtures and materials installed without the above trade marks shall be removed and replaced with properly marked fixtures and fittings without any extra cost to the Owner.

- Materials schedule

PIPE AND FITTINGS MATERIALS

ITEMS	GIP Sch. 40 Standard	PVC Sanitary II Series 1000	Cast Iron Pipe (CIP)	CU Type L
A. Plumbing	X (indoor)			
1. Cold water supply				
2. Hot water supply				X
3.Outdoor Sanitary Sewer system		X		
4. Indoor House drain System			X	
5. Downspout	X			
6. Soil, waste	(Sch.20)			
7. Vent		X		

Legend:

GI	-	Galvanized Iron Pipe
PVCP	-	Polyvinyl Chloride Pipe
CIP	-	Cast Iron Pipe
Cu Type L	-	Copper Pipe

- **Notes:**

  Where uneven settlement at pipe joints is likely to occur, use Gilbault joint or the other suitable flexible fittings.

  GI pipe when buried underground shall be given corrosion protection (painted with coal tar enamel and wrapped with non-water absorbent and painted again with coal tar enamel and wrapped with non water absorbent felt).

Gate Valves and Check Valves

Of Valves	Disc	Stem	Body	Connection	Standards	Remarks
75 mm (3") and Larger check Valves,10.5 kgs/cm^2 (150 psi)	Swing Disc	-	Iron with Bronze Trim	Flanged	AWWA c.500-71	
63mm (2-1/2") and smaller check valves, 10.5 kgs/sq.cm. (150psi) Working pressure.	Lift Disc	-	All Bronze	Female Threaded	Federal WW-V-58	
75mm (3") and larger Gate valves exposed 10.5 kg/sq.cm.(150psi) working pressure.	-	Rising	Iron with Bronze Trim	Flanged	AWWA c.500-71	
63mm (2-1/2") and smaller gate valves 10.5kg/sq.cm. (150psi) working pressure.	-	OS&Y	All Bronze	Federal Female Threaded	Specs WW-V-58	
75mm (3") and larger gate valves 10.5 kgs/sq.cm (150 psi) working pressure.	-	-	IBBM	AWWA	-	For use with pumping install.

- **Notes:**

  Swing Check valves 75mm and larger shall be provided with spring or weighty load control attached to flap disc axle.

  When valves are placed or located in a box or compartment the valve stem shall be non-rising but provided with VALVE OPEN and CLOSE indicator attached to stem.

Hose Bibbs

Hose bibb shall be size 13mm (1/2") male and 19mm (3/4") hose thread, bronze body conforming to ASTM Specification B62 suitable for cold water pressure up to 10.5 kg/cm (150psi), equal or similar to No. 58 Chicago hose valve screwed connections, with rubber composition disc, American Standard Taper Pipe Thread on the inlet and standard hose thread on male outlet.

Pipe Hangers

- Horizontal Runs:
- Adjustable mild steel or malleable iron pipe hangers
- Vertical Runs:
- Mild steel clamp or collars
- Hangers for water and vent pipes:
- For 63mm (2-1/2") and larger: Band Type 6.285mm x 32.5 mm (¼" x 1¼") flat mild steel black iron with round iron rod with plates and knots.
- For 50mm (2") and smaller: Split Ring Type with 9.4mm (3/8") iron rods with inserts, plates and knots, toggle bolt clamps expansion shield.

Jointing

- Cold Water Lines:
- Flanged Joints Gasket "Garlock" of equal Screwed Joints: U.S.
- Federal Specification GG – P –251.
- Sanitary Drainage Lines: Lead and oakum CISP, PVC cement or
- Rubber ring for PVC.
- Storm Drainage Lines:
- Cement mortar for concrete drain pipes, PVC cement for PVC pipes.
- Dissimilar Pipes: Adapter fittings shall be used.

Drains

- Similar or equal to "ASA" Model No.- 40B, with Type 125mm
- Strainer or approved equal.
- Floor drains (at toilets/baths): "ASA" Model No. – 40B, with Type 125mm strainer or approved equal.
- Balcony drains: ASA No. 40 – 9A
- Roof Drains: ASA No.10 – 8.2

Outdoor Pipe Lines, Appurtenances

- Sewer Junction Boxes
- -2000 psi reinforced concrete with pre-cast R.C. cover provided 2 recessed steel lifting eyes.
- Area- Drain Catch Basin – 2000 psi R.C. with cast iron grating cover.
- Storm Drain Junction Boxes – 2000 psi R.C. cover provided 2
- Recessed lifting eyes.
- Sewer Pipe Concrete Encasement – 3000psi R.C.

Float Valve

- Shall be hydraulically operated, pilot controlled diaphragm actuated, single seated with disc. Valve shall open wide when float is at low water level and close drip type when float is high level. Class 125 Cast Iron body with bronze trim.

Testing of Materials

Samples of various types and kinds of materials shall be approved by the
Owner's Representative before any work is started. During the progress of work, a sufficient number of samples to ascertain the quality, maybe tested and the cost of such samples shall be included in the price bid by the Contractor. Results of test shall be submitted to the architect for evaluation at least working days before materials is due for installation the job.

C. INSTALLATION

- General

Cutting and repairing

The work shall be laid out in advance and any cutting of construction shall be done with the written permission of the Owner's Representative or his authorized representative. Roughing in for pipes and fixtures shall be carried out along with the construction of the building of structure. Openings shall be left in walls and floors of proper sizes correctly located for the pipes but the contractor shall do any additional cutting needed in case of error or omission and shall properly replace any concrete work or flashing around the pipes as maybe required without additional cost to the Owner.

All items to be embedded in concrete shall be thoroughly cleaned free from all rust, scale and paint.

Protection

The Plumbing Contractor shall protect all his work and materials from loss, injury or defacement. Protection of fixtures and materials shall be provided by boards, papers and or cloth as required as required, and any loss, damage or deface materials shall be replaced by the Plumbing Contractor at his own expense.

Installation

The work throughout shall be executed in accordance with the best practice of the trade and in the best and true manner under the direction of the licensed Sanitary Engineer or Master Plumber and to the satisfaction of the Owner's Representative who will interpret the intent of the contract drawings and specifications and shall have the power to eject any work or materials which are not in full accordance herewith.

The piping in any location shall be closed-up, furred-in, or
Covered before the examination and testing of it by the government inspector, Owner or their representative.

- Plumbing Fixtures and Equipment:

All bids to be considered shall include installation of all plumbing fixtures shown on the drawing and specified by the Owner's Representative.

All plumbing fixtures and equipment shall be installed free and open in a manner to prove easy access for cleaning and shall be furnished with all brackets, cleats, plates and anchor required to support the fixtures and equipment rigidly in place.

After installation of a any or all the plumbing fixtures for the building, same shall be kept clean and in working order and shall not be used by any one until the building has been formally turned over to and accepted by the Owner.

Fixtures, fittings, trims, faucets, escutcheon, traps and waste pipes that are exposed to view in finished spaces shall be brushed, with polished chromium plating or nickel finish, unless otherwise specified.

The Plumbing Contractor shall be responsible for the supply of fixture fittings (or trims) which are not provided with the fixture but required for the complete installation. All

fixtures shall be carefully checked to determine the items that must be provided to complete the installation.

All fixtures shall be provided with the individual shut-off valve so that any fixture maybe separately controlled without affecting other fixtures supplied from the same distribution line.

All flushometer valves shall be equipped with vacuum breaking devices.

- Fittings

All change in size of soil waste and drain lines shall be made with reducing fittings or reducers.

Where it becomes necessary to use short-radius fittings in any other locations, prior written approval of the Architect shall be obtained.

No fitting or connections that offers abnormal obstruction to flow shall be used.

Enlargement of a 75mm (3”) closet bend or stub to a 100mm (4”) pipe is acceptable.

- Cleanout Plugs and Traps

Cleanout Plugs

Cleanout installed in connection with cast iron-bell and spigot shall consist of a long – sweep quarter bend, or one or two eight-bends extended to an easily accessible place, or where indicated on the drawings.
An extra-heavy, cast brass ferrule with counter-sunk tap screw cover shall be caulked into the hub of the fittings and shall be even or level with finish floor or wall.

Where clean-outs in connection with thread pipes are indicated and are accessible, they shall be cast-iron drainage T pattern 90 degree branch fittings with the extra heavy brass screw plugs of the same size as the pipe up to, and including 100mm (4”).

Traps

Every plumbing fixtures connected to the sanitary drainage system shall be equipped with a trap. Traps are specified to be supplied with the fixture, i.e. water closets and urinals.

Each trap shall be placed as near to the fixture as possible.

Traps installed on hub and spigot type shall be extra-heavy cast iron.

Traps installed on threaded type shall be recessed drainage pattern.

- Sleeves and Supports

General

Pipe sleeves, pipes support, and fixture shall be furnished and set, and the Contractor shall be responsible for their proper permanent locations.
Pipes shall no be permitted to pass through columns, footings, beams or ribs unless noted on the drawings or with the written approval of the Owner’s Representative.

Pipe Sleeves

Pipe sleeves shall be installed and properly secured in place at all points where pipes pass through masonry of concrete.

Pipe sleeves except sleeves through footings shall be sufficient diameter to provide approximately ¼” clearance around the pipe or insulation.

Pipe sleeves in walls and partition shall be cast-iron or steel pipe.

Flashing sleeves shall be installed where pipes pass through waterproofing membrane.

The sleeves shall be provided with an integral flashing flange or a clamping device to which a flashing shield can be clamped or soldered.

The space between the pipe sleeve shall be made watertight by inserting packed-oakum and filling the remaining space with poured lead or epoxy and caulking thoroughly.

Escutcheon shall be installed around all exposed pipes except water closet starts or bends passing through finished floors, walls or ceilings. Escutcheons shall be of sufficient outside diameter to cover the sleeve opening and shall fit snugly around the pipe. Escutcheons shall be cast–brass chrome plated of the approved size and make, provided with a set screw to properly hold escutcheons in place.

Fixtures and Equipment Supports and Fastening

All fixtures and equipment shall be supported and fastened in a safe and satisfactory manner.

Inserts shall be securely anchored and the anchors shall be properly filled with mortar. Inserts shall be installed even or level with finish wall and shall be completely concealed with the fixtures and installed.

Where through bolts are used, they shall be provided plates or washers at the back and set so the heads, nuts, cap nuts and screw heads shall be chromium plated and shall be provided with chrome plated brass washer.

Use a water closet floor flange for mounting fixtures with an appropriate ball wax as gasket. Use stainless steel bolt and knots to fasten the flange and foot of the water closet.

- Hangers, Anchors, Guide Inside Buildings

  All piping shall be rigidly supported by means of approved hangers and support. Piping shall be supported to maintain required position and pitching of lines to prevent vibration and to secure piping in place and shall be so arranged as to provide space for expansion and contraction.

  Hangers shall conform to the standard details but the contractor may, if he elects use other commercial hangers having parts not lighter than indicated on the details, provided that he has obtained prior to written approval of the engineer. Chains, straps, perforated bars or wire hangers will not be permitted.

  Inserts shall be cast-iron steel and shall be of type to receive a machine bolt in one horizontal direction and shall be installed before the concrete is poured.

  Vertical runs of pipe shall be supported by mild steel clamps or collars spaced not more than two floors apart.

  Schedule of hangers on water piping shall be as shown on the detailed plan.
- Ceilings, Plates, and Flashing:

  Floor, Walls and Ceiling Plates:

  Where uncovered or exposed pipes through floor, finish walls or finished ceilings, they shall be fitted with chromium plated steel plates.

  Plates shall be large enough to completely close the hole around the pipe and shall be squared, octagonal, or round with the less dimension not less than 38mm (1 ½") larger than the diameter of the pipe.

- Joints and Connections

Fixture connections:

Closet bolts shall not be less than 6mm (1/4”) in diameter and shall be equipped with chromium plated cap nuts washers.

The system shall hold this water for a full 30 minutes during which time there shall be drop more than 100mm (4”).

If and when the Architect decides, the additional test is needed such, as an air or smoke test on the drainage system, the Contractor shall perform such test without additional cost to the Owner.

- Pressure Test for Water System

  Upon completion of the roughing-in and before setting fixtures, the entire hot and clod water piping system shall be tested at a hydrostatic pressure one-and-half times the expected working pressure in the system when in operation, and proved tight this pressure (but not less than10.57 kg/c.m. or 150 psi) for a period of two hours.

  Where the portion of the water piping system is concealed before completion, this portion shall be tested separately in a manner similar to the described for the entire system and in the presence of the Owner’s Representative.

- Leakage Test for the Water System

  Leakage test shall be conducted after the satisfactory completion of the pressure test and shall consist of an examination of all joints for leakage test for the completed pipeline.

  The pressure to be maintained during the test shall be the designed working pressure of the system.

  Leakage test shall be made only after the minimum of 24 hours after the pipe to be tested has been filled with water. No test shall be made until at least 7 days after the last concrete thrust or reaction backing has been cast with standard cement.

  The duration of each leakage test shall be two hours unless otherwise specified by the Architect.

  Each section of pipeline shall be slowly filled with water and the specified test pressure, measured at the point of lowest elevation, shall be applied by means of a positive displacement type pump, in manner satisfactorily to the Owner’s Representative.
  Before starting the leakage test, all air shall be expelled from the pipe. All exposed pipes, fittings and valves, joints shall be examined for leakage during the test.

ALLOWABLE LEAKAGE RATE PER 100 JOINTS PER OR PIPE DIAMETER AT PRESSURE STIPULATED.

PRESSURE		LEAKAGE RATE	
PSI	Kg/cm^2	Liters/Hour	Liters/2Hour
50	3.50	1.45	2.90
75	5.30	1.75	3.50
100	7.00	2.05	4.10
125	8.80	2.30	4.60
150	10.50	2.50	5.00
200	14.00	2.90	5.80

- Defective Work

If inspection or test shows any defect, such work or materials shall be replaced and the inspection and test repeated until satisfactory to the Owner's Representative.

All repairs to piping shall be made of new materials at the expense of the Contractor.

No caulking of screw joints or holes will be accepted.

- Disinfection of Water Distribution System

  The entire water system shall be thoroughly flushed and disinfected with chlorine before it is placed in operation.

  Chlorinating materials shall be either liquid chlorine or hypochlorite, as specified, and shall be introduced into the water lines in a manner approved by the Owner's Representative.

  The chlorine dosage shall be such as to provide not less than 50mg per liter of available chlorine.

  Following a contact period of not less than 24 hours, the heavily chlorinated water shall be flushed from the system with clean water until the residual chlorine content is not greater than 2 tenths (0.02) mg/L. All valves in water lines being sterilized shall be closed several times during the testing period.

- Disinfection of Water Tanks

  The water tanks and reservoir shall be thoroughly finished and disinfected with chlorine before it is placed in operation.

  Chlorinating materials shall be liquid chlorine or hypechlorite, as specified and shall be introduced into the water tanks and reservoir by swabbing and approved protection for the worker's safety shall be provided during the swabbing work.

  The chlorine dosage shall be such as to provide not less than 50 parts per million (50ppm) of available chlorine.

  Following a contact period of not less than a period of 24 hours, the heavily chlorinated water shall be flushed from the system with clean water until the residual chlorine content is not greater than two tenths (0.02ppm).

- Refer to Structural Specification for Reinforcement

- Painting

  All exposed soil, waste and vent piping of cast-iron is asphalt or tar coated shall be given two coats of shellac and two coats of oil enamel finish coating.

  Color Code

  All exposed piping, shall be adequately and durably identified by distinctive color paints as follows:

Cold water pipe	-	Blue
Hot water pipe	-	Blue with Red bands at 1.00m on center
Aluminum	-	Gray Green
Storm water pipe	-	Orange
Sewerage pipe	-	Black
Vent pipe	-	Gray

E. GUARANTEE

- The Plumbing Contractor shall furnish to the Owner a written guarantee covering the satisfactory operation of the plumbing installation in all its part for a period of one year after date of acceptance. During this period the plumbing contractor shall repair or replace any defective work and pay for any repair or replacement cost.

F. WATER RESERVOIRS

- Piping, fittings, and miscellaneous metal works

  Furnish and install all pipes, fittings, valves, specials, pipe supports, miscellaneous metal works and all required appurtenances as shown in the plans and as required to make the entire water tank piping system operable.

  All materials furnished and installed shall be new and guaranteed free from defects, in design materials and workmanship.

  Adequate protection, measures shall be provided to protect pipe, fittings, valves and all other materials from damage and injury during storage and installation.

  Wall pipe sleeves shall be cast-iron seepage ring or anchor ring.

- Manhole Frame Cover

  All casting for manhole frames shall tough gray iron, free from wraps, cracks, holes, swells, and cold shuts, and approximately 3.2mm (1/8”) thick.

  All casting shall conform to the requirements of ASTM Standard A-48 for gray iron casting.

- Ladder Rungs

  Ladder rungs inside the reservoir shall be 19mm (3/4”) diameter round bars, stainless steel for outside the reservoir, shall be cast iron and as shown in the drawing They shall be placed on the walls as shown in the drawings.

- Installation

  All pipes shall be carefully placed and supported at the proper lines and grades and where possible shall be sloped to permit complete draining.
  Piping runs shown in the drawings shall be followed as closely as possible, except for minor adjustments to avoid architectural and/or structural features. If major relocation is required they shall be subjected to the approval of the Architect.

  Piping shall be properly supported by suitable anchors, brackets, or hangers. Vertical pipes shall be anchored by suitable galvanized steel traps. Pipes supports shall be provided as shown on the plans and whatever else necessary to prevent strain on joints to facilitate taking down pipes.

  Carefully inspect all pipes and fittings before installation. Inspection of pipes shall include light tapping with a hammer to detect cracks or defects. No pipe, fittings or valves are cracked or show defects shall be used.

  All pipes and fittings shall be carefully cleaned immediately before installation. Every open end of a pipe shall be carefully capped or plugged before leaving the work.

- Pipe Jointing

  Flanged Pipe shall true to length. Joints shall be made up square with even pressure upon the gaskets and must be perfectly watertight. Gasket shall fit the outside dimension of the pipe accurately so that surplus materials projects out into the flow area. The completed joint shall be smooth and properly aligned.

- Pipe Through Walls

  All equipment shall be supplied from reputable firms engaged in the manufacture of each particular item. The entire assembly when installed shall be given a start-up and test run to prove that all specifications have met before acceptance. The test duration shall be 24 hours.

G. EQUIPMENT

- All equipment shall be supplied from the reputable firms engage in the manufacture of each particular item. The entire assembly when installed shall be given a start-up and test run to prove that all specifications have met before acceptance. The test duration shall be 24 hours.

- The equipment and installation shall be guaranteed for a period of at least one-year trouble free operation.

H. PUMPS

- General

  The specification hereinstated are basic guides only. Another items not so indicated but which are obviously necessary for the proper operation of the system as intended shall be supplied and installed, in accordance with accepted engineering standards.

  Manual of operation and maintenance and list of spare parts shall be supplied together with the equipment.

  The supplier shall submit at least four (4) copies of pumps performance curves showing among others, the pump rating and the pump efficiency, properly marked out.

  Accessories to be supplied for each pump shall include non-slam type check valve (Cla-val), two vibration insulators and two gate valves, of size as the pump suction and another discharge and rated 68 kg/cm^2 (150psi) for each pump and pipe fittings necessary for complete installation.

  Price quoted shall include cost of delivery of all quoted items to the jobsite, proper installation and pump and motor installation dimension drawings.

  The brands, names and place of manufacture of pumps, motors, valves, controls and all accessories where applicable shall be indicated in the quotation. Include also a description of the pump impellers being offered.

  A metal name plate indicating in indelible letters for the correct specifications of the pump and motors shall be properly attached to the assembly at a location such that the information written thereon can be conveniently read by all concerned.

- Booster Pumps for the Hydropneumatic System

  Number of units: Two identical units.

  Capacity of each unit: As shown in the drawings.

  Type: Centrifugal horizontal-end suction vertical split, coupled to an electric motor in common base, suitable for pumping domestic water supply.

  Electric Motor Drive: 230 V, 3 Phase, 60 cycles open drip proof.

Motor Controls: Reduced voltage magnetic starter, H-O-A switches over load relays, alternators and pressure switch to stop and start the pumps at high and low pressure cut-off/cut-in and liquid level detector at reservoir to prevent pump from running dry.

Accessories: Vibration insulating hose connection at suction and discharge line and pressure relief valve at discharge only.

- Pressure Tanks

  Vertical Tank, stainless steel and 100 psi rating. The tank capacity is shown in the drawing. Provide with accessories as relief valve, sight glass tube level indicator encased in copper or stainless steel tubing, fully automatic air volume controller device, pressure gauge (in100man dial face diameter), cocks, pressures switch and drain valve.

I. As-Built Drawings

The plumbing Contractor, shall mark down with the red pencil on the two sets of plumbing plans all the revision, omissions, and or additions to various plumbing installation, drawings as the construction progress. One set of the plans as marked shall be submitted to the Architect after completion of the work.

Before the final payment is made to the Contractor, he shall submit to the Owner, As-Built drawing incorporating all the change made and noted in the marked plans retained by him. The As-Built Drawings shall be prepared on reproducible form.

The Plumbing Contractor shall prepare and submit the As-Built Drawings without extra cost to the Owner.

J. Miscellaneous

- Throughout the construction period, open ends of all installed pipelines shall be kept closed by temporary plugs. Drainage lines shall not be kept closed by temporary plugs. Drainage lines shall not be used to conduct dirty construction wash-water, especially those with cement, to avoid possible clogging.

- The contractor shall provide a temporary fire protection system, at each building during the construction period. This shall be of sufficient capacity to put out any fire that maybe break out at any of the building floors due to the construction operations. This is in addition to temporary extinguisher required.

- A temporary potable water supply shall be available to construction workers at each building floor as the construction work progress.

- A temporary human excreta disposal system shall be provided by the Contractor to serve the workers during the construction period.

ELECTRICAL WORKS

I. GENERAL PROVISIONS:

A. WORK DESCRIPTION, GENERAL:

- The work to be done under this specification consist of fabrication, complete details of the electrical works at the subject premises and all work and materials incidental to the proper completion of the installation except those portion of the work which are expressly stated to be done by others.

- All works shall be in accordance with governing codes and regulations and with the specifications.

- The requirements with regards to materials and workmanship specify the required standards for the furnishing of all labor, materials, and appliances necessary for the complete installation of the work specified herein and indicated on the drawings.

- These specifications are intended to provide a broad outline of the required installation but are not intended to include all details of design and construction.

B. CODES, INSPECTION, PERMITS AND FEES

- The work under this contract is to be installed according to the latest requirements of the following:

  1. Philippine National Building Code
  2. Philippine Electrical Code
  3. Electric Cooperative in that areas

- All construction permits and fees required for these works shall obtain by and at the expense of the Contractor. The Contractor shall furnish the Architect, the Engineers and the Owner of the final certificate of inspection and approval from the concerned government authorities after the completion of the work. The Contractor shall prepare all shop drawings, as-built plans and other paper work required by the approving authorities.

- The Contractor shall secure approval from authorities of all plans for construction.

C. RECORD OF DRAWINGS

- The contractor shall record all deviations of the actual installation based on the contract drawings. Upon completion of work, the Contractor shall submit two copies of the as-built drawings indicating the work installed and finished including new information (revisions) not originally shown in the contract drawings to the Engineers for the approval as to conformance with the design concepts and compliance with pertinent code provisions. After such approval, the Contractor shall submit the as-built drawings original to the Owner.

D. COORDINATION

- Coordinate timing of installation with work of other trades.

- Systems provided shall be completed and operable and shall include required accessories fastenings and supports.

- Determine required locations, arrangements and quantities of equipment and materials from drawings, schedules and specifications.

- All equipment shall be installed in strict compliance with manufacturer's recommendations.

- On certain items of equipment specified on other contracts requiring electrical connections, the Contractor shall provide such connections as required.

E. MINOR MODIFICATIONS

- The plans as drawn are based upon architectural plans and details. Show conditions as accurately as possible to indicate them to scale. The plans do not show all fittings necessary to fit the building conditions. The location of outlets, apparatus, and equipment shown on the plan are just approximated. The Contractor shall be responsible for the proper location in order to make them fit, with architectural details and instructions from engineers representative at the site.

F. GUARANTEE

- The Contractor shall guarantee that the electrical system is free from all grounds, from all-defective workmanship and materials that will remain in good condition for a period of one year from the date of acceptance of work. This Contractor at his own expense shall repair any defects appearing within the aforementioned period.

- The Contractor shall indemnify and save the Owner, the Architect and the Engineers from and against all liability for damage arising from injuries or disabilities to persons or damage to property occasioned by an act or omissions of the Contractor or any of his subcontractors including any and all expenses, legal or otherwise which maybe incurred by the Owner, the Architect or the Engineers in the defense of any claim, action and suit.

G. APPROVALS, SUBSTITUTIONS, Etc.

- Wherever hereafter the word “Approval” or “Approved” (make, type, size, arrangement, etc.) are used specifically with regard to manufactured items, etc., or wherever it is desired to substitute a different make or type, all information pertinent to the adequacy and adaptability of the proposed apparatus, shall be submitted to the engineers for their approval before the apparatus is ordered or installed.

H. SUB-CONTRACTS, Etc.

- This Contractor shall be held fully responsible for the work of any sub-contractor or manufacturer performing work for or supplying materials as it is intended that the entire electrical work when finally delivered to the Owner shall be ready in every respect for satisfactory and efficient operation.

I. WORKMANSHIP

- The work throughout shall be executed in the best and most thorough manner to the satisfaction of the Architect and Engineers, who will jointly interpret the meaning of the drawings and specifications and shall have power to reject any works and materials which in their judgement are not fully in accordance therewith.

II BASIC MATERIALS AND METHODS

A. GENERAL

- Furnish and install all conduits, joints, outlet boxes, wires and miscellaneous materials required for wiring, as specified herein and as shown on drawings.

- Furnish and install all power and control wiring to all equipment except as otherwise specified.

- Perform test and adjustments and submit specific reports herein.

B. POLYVINYLCHLORIDE CONDUIT

- General: Standard trade size, heavy wall, manufactured to NEMA TC – 2 type rated for 90-degree C cable.

- Materials: Polyvinyl chloride conduit extruded use Atlanta or approved equivalent.

- Nominal Size: 20mm diameter minimum.

- Couplings and Fittings:

- Use Limitations

As specified in the latest edition of the PEC.
Not permitted where subject to mechanical damage

- Pulling Hardware: flat fish tape with ball and flexible leather or polyethylene or manila rope. Use of steel pulling cable not permitted.

C. CONDUIT INSTALLATION

- General: Install in accordance with applicable codes and recognized standard of good practice.

- Actual routing subject to approval

- Joints: Make with approved couplings and unions to provide electrically continuous and moisture tight systems.

D. CONDUCTOR INSTALLATION

- Place all wiring, in a raceway or types indicated. Provide all required and indicated accessories for proper installation of all wiring

- Splicing:

  Permissible only in junction boxes or similar accessible location. Number of splices held to absolute minimum.

E. DISTRIBUTION PANEL BOARD-FUSIBLE SWITCH

- General: Furnish and install distribution and power panel boards as indicated in the panel board schedule and where shown on the drawings. Panel boards shall be dead front safety types, equipped with quick-break fusible branch switches and approved for service entrance. The acceptable manufacturers of the panel board are General Electric and Square “D” or approved equal.

- Fusible switches: All fusible branch switches shall be quick-make, quick-break, with visible blades and dual horsepower ratings. Switch handles shall physically indicate ON and OFF position. Such handles shall be able to accept three padlocks having heavy duty industrial type shackles. Covers shall be interlocked with the switch handles to prevent opening in the ON position. A means shall be provided to allow authorized personnel to release the interlock for inspection purposes when a switch is ON. A cardholder providing circuit identification shall be mounted on each branch switch. Switches shall be provided with a Bussman Fusetron fuses or as noted on the drawings.

- Bussing Assembly: Panel board bus structure and main lugs or main switch shall have current ratings as shown on the board schedule. The bus structure shall accommodate plug-on or bolted branch switches and motor starters as indicated in the panel board schedule without modification to the bus assembly. Provide solid neutral (S/N) assembly when required.
- Equipment Rating: Switches and panel board bus structure shall be safe and without failure withstand short circuits on the systems capable of delivering up to 50,000 amperes RMS symmetrical, unless otherwise noted.

- Cabinet: Panel board assembly shall be enclosed in a steel cabinet. The rigidity and gauge of steel is to be as specified in UL Standard for Cabinets. The size of wiring gutters shall be in accordance with UL Standard. Cabinets shall be equipped with a front door and shall be full finish steel with rust inhibiting primer and baked enamel finish.

F. PANEL AND BOX

- Box, plain steel front, complete with hinged door, polished metal catch and lock Manufacturer's standard finish. Repair any damage to finish in a manner acceptable to the engineer.

- Mounting: Flush and surface required.

- Cardholder on inside of the door with clear plastic cover and complete type written schedule of panel branch circuits. Leave spare circuits blank.

- Nameplate: Required at each panel.

- Installation: As shown, maximum distance from the floor to the highest breaker (centerline) shall be 1.8m. Provided mounting materials required make connections specified as shown. Use collars around mounting bolts or equivalent means to provide air space between panels and walls.

- Warranty: A warranty for a period of one year shall be provided for failure of components resulting from normal use and/or factory defects.

G. SERVICE ENTRANCE

- Service Voltage: 230V, single phase, 2 wire, 60 Hz.

- Installation: Contractor shall furnish and install the complete service entrance, conduits and accessories.

- Conduits: Use RSC "NICHI" or approved equal.

III. LIGHTING

A. GENERAL

- Furnish, install and wire all equipment and materials required for complete lighting system as specified as shown.

B. LIGHTING FIXTURES

- Fluorescent Fixture: housing - #22 gauge, B. I. Sheet formed, screw with machine stove bolt and/or welded.

- Fluorescent Fixture Ballast: 230V, high power factor, rapid start, manufactured by Philips, G. E. or approved equal.

- Wiring:

  General: Fixture wiring shall comply with fixture manufacturer's recommendation and PEC requirements.

  Incandescent Fixtures: Use type TF wire in unwired fixtures. Minimum wire size 3.5mm″.

- Location: Approximately as shown. Modify to avoid other equipment or structural components. Provide necessary conduits, wire, fittings and miscellaneous materials.

C. COORDINATION

- Coordination installation of all lighting fixtures with work of other trades

- Coordination exact location of fixtures with respect to suspended ceiling layout to achieve uniformity.

D. SHOP DRAWINGS AND SAMPLES

- Prepare and submit for approval before manufacturing the following:

  Fabrication drawings
  Sample of each fixtures

E. WARRANTY

- All fixture components shall be covered with a warranty for a period of one year against failure resulting from normal use and/or factory defects.

F. GENERATOR

- General

  The generator shall be _____ Kw standby duty, single phase, 2w, 60Hz, 1800 RPM, 240V, and shall have two bearings of the sleeve type and shall be direct connected to the engine flywheel with a flexible coupling. The generator shall have full armature winding. The transient voltage drop on sudden application of 100% rated load shall be less than 15%.

  Voltage Regulator shall be of the same manufacturer as generator, with manual/automatic switch.

  Generator shall be open drift-proof construction with an over all efficient of at least 90% of at full load.

  The generator shall have full rated neutral brought out at the terminals for system use.

- Conduits and Fittings:

  Conduits in general shall be Intermediate Metallic Conduit (IMC).

  No Conduits shall be used in any system smaller than 15mm internal diameter electric trade size, nor shall have more than four (4) 90 degrees bends in any one run and where necessary, pull boxes shall be provided as directed.

  No wire shall be pulled into any conduits until the conduit system is completed in all details, in the case of concealed work until all rough plastering machinery has been completed, and in the exposed work until the conduit work has completed in every detail.

- Wires and Cables

  All wire shall be copper; soft drawn and annealed shall be of 98% conductivity, shall be smooth and true of cylindrical form and vibration shall be within 1% of the actual size.

  All wires and cables shall comply with the requirements of UL as they apply to the particular usage.

  All wires and cables shall be as manufactured by Phelps Dodge, American Wires and Cables, or approved equal.
  THHN/THWN can be used for the same size of wires provided the allowable current do not exceed that of

  All wires 8 mm″ and larger shall be stranded copper.

  For power system, no wire smaller than 3.5 mm″ shall be used except for control leads unless otherwise specified.

- Installation

  Installation shall conform to the requirement of the code.

Testing

The generator set shall receive the manufacturer's factory load testing prior to delivery.

Prior to acceptance of the installation, equipment shall be tested on site for 8 hrs. Continuous operation without any failure to show it is free of any defects will easily start and be subjected to full load test or that load that is available at the job site. Should failure occur during the testing, the Contractor shall rectify the deficiencies and shall repeat testing procedure at his own expense and to the satisfaction of the owner.

On completion, of the installation, a factory trained supplier or dealer's representative shall perform start-up based on operating instructions book.

SPECIALTY WORKS

A. STRUCTURAL STEEL WORKS

Scope:

- This section includes structural steel work complete.

General:

- Connection for which details are not indicated shall be deigned in accordance with the "American Institute of Steel Construction Manual of Sheet Construction" and shall be welded and bolted.

Requirements.

- Handling, shipping and storing of steel work.
- All materials shall be handled shipped and stored in a manner that will prevent distortion or other damage. Materials shall be stored in a clean location and keep properly drained. All damage materials shall be replaced or repaired by at the expense of the Contractor.
- Anchor bolts and sag rods shall conform to ASTM A 307 and applicable portions of A 36.
- Structural carbon steel for plates, angles, or shapes shall conform to ASTM specification A36.
- Cold-formed, light gauge structural member shall be formed from sheet or strip not less than 5mm thick and conforming to "Specifications for the Designed Light Gauge Cold-Form Steel Structural Members" of the American Iron and Steel Institute.
- Saddle shall be standard manufactured products of section shown and shall be heat treated, extruded aluminum alloy 6063-TS, conforming to ASTM Specification B221.
- Expansion shields shall be of the style, type and size suited for the intended use. Shields shall be accurately recessed and unless otherwise indicated shall be not less than 50mm into concrete or masonry.
- Bolts, nuts and washers shall be zinc-coated, regular commercial grade size as indicated and shall conform to ASTM specification A307.
- Power driven nails shall be steel, especially formulated to produce high ductility and hardness and capable of being explosively driven through the medium to be attached.
- Welding electrodes and rods for manual welding shall conform to AWS Specification A5.1 860.

- Expanded metal lath shall be as indicated and shall be of the close mesh, heavy duty and rigid type.

- Nails shall be common or finishing of the proper sizes for the intended use and shall be of the best commercial standard.

- Stainless steel and anchor clips, bolts and plates shall be of configuration and sizes shown and shall conform to the best commercial standard as approved.

- Workmanship and finish shall be equal to the best practice of modern shops for the respective work. Exposed surfaces shall have the smooth finish; sharp and well defined lines. Section shall be well framed to shape and size with the sharp lines and angles; curved work shall be sprung evenly to curves. All necessary rivets, lags and brackets shall be provided so that the work can be assembled in a neat and substantial manner. Holes for bolts and screws shall be drilled. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall provide ample strength and stiffness. Joints exposed to the weather shall be formed to exclude worker. Metal work shall be provided with proper clearances. Works shall be fabricated and installed in a manner that will provide for expansion and contraction, prevent the shearing of bolts, screws and other fastening, insure rigidity and provide close fitting of sections.

- Inserts and sleeves. Inserts of suitable and approved type shall be furnished and installed where necessary for the support of piping, mechanical equipment or apparatus, or other work. Steel pipe sleeves of suitable types and size shall be provided where indicated and where required for all pipe passing through floors, roofs or walls.

- Anchors and bolts shall be provided where indicated and where necessary for fastening work in place. They shall be embedded in the concrete and masonry as the work progresses and shall be spaced about 61cm on centers, unless otherwise indicated or specified. Sizes, kinds and spacing of anchors not indicated or specified shall be necessary for their purposes. All anchor and anchor bolts in exterior walls and in area exposed to weather shall be zinc coated, all those in other location shall be coated heavily bituminous paint.

Structure's subject to static loading.

- Holes fore bolts shall be drilled or sub-punched and reamed except that where the thickness of the material is not greater than the nominal diameter of the bolt plus 3mm, the holes may be punched full size.

Common bolts.

- Bolts transmitting shear shall be threaded to such a length that not more than one thread would be within the grip of the metal. The bolts shall be of such length that they will extend entirely through the nuts with the beveled end outside the nut. Bolt heads and nuts shall be drawn tight against the work with a suitable wrench not less than 38 cm long. Bolt heads shall be tapped with a hammer while the nut is being tightened.

Shop Painting

- All structural steel work, except zinc coated surfaces and steelwork to be embedded in concrete or mortar, shall be shop painted. Surfaces to be welded shall be not coated within 75mm of the weld, prior to welding. Surfaces shall thoroughly dry and clean when the paint is applied. No painting shall be done in wet weather except undercover; the temperature shall be above 45 degrees F but not over 90 degrees F. Paint shall be applied thoroughly. Surfaces that will be concealed or inaccessible after assembly shall be painted prior to assembly.

Cleaning

- Except as modified herein, surfaces shall be cleaned to bare metal by a suitable blasting process. Surfaces that maybe damaged by blasting shall be cleaned to bare metal by powered wire brushing or other mechanical means. Surface that will be enclosed from the weather and subject to exposure no more corrosive than an indoor atmosphere controlled for human comfort, maybe cleaned by wire brushing or other manual or mechanical means for removal of loose mill scale, rust, dirt and grease. Baring surfaces, including contact surfaces within friction type joints shall not be painted or galvanized but shall be coated with rust preventive coating applied, applied in the shop. The coating shall be removed just prior to field erection using a remover approved by the rust preventive manufacturer. The surfaces when assembled shall be free from rust, greases, dirt and other foreign matter.

Pre-treatment

1. Except as modified herein, immediately after cleaning surfaces shall be coated with coat of pre-treatment coating applied to a dry film thickness of 0.3 to 0.5 mil or be given a crystalline phosphate base coating shall be applied only to blast-cleaned bare metal surfaces.

Match marking

- Members and component part of structures shall be assembled and match marked prior to erection to ensure accurate assembly and adjustment of position on final erection. Painted assembly markings shall be removed from any surface to be welded or riveted. Scratch or notch marks shall be located in a manner that will not affect the strength of member or cause concentrations of stress.

Erection

1. General. Except as modified herein, erection shall be done in accordance with the applicable specifications and standards of the AISC “Manual of Steel Construction”. Erecting equipment shall be suitable for the work and shall be in first class condition. Where parts cannot be assembled or fitted properly as results of errors in fabrication or of deformation due to handling or transportation, such condition shall be reported immediately to the construction architect/engineer and his approval of the method correction obtained The correction shall be made in his presence. Bent or damaged parts shall be rejected. Steelwork shall drain properly. Pockets in structure exposed to the weather shall be filled with waterproof materials. Safety belts and lines shall be used by workers on high structures, unless safe working platforms or safety nets are provided.

Assembly.

- The frame of steel structure shall be carried up true as shown and all match markings shall be followed. Temporary bracing shall be used wherever necessary to support all loads to which the structure maybe subjected, including equipment and operation thereof and piles of materials. Such bracing shall be left in a place as long as maybe required for safety. The various members forming parts of a completed frame after being assembled shall be aligned and adjusted accurately before being fastened. Fastening of splices of compression members shall be done after the abutting surfaces have been brought completely into contact. No riveting, welding or bolting shall be done until match of the structure has been stiffened and aligned properly. Bearing surfaces and surfaces, which will be in permanent contact, shall be cleaned before the members are assembled. As erection progress, the works shall be bolted or welded sufficiently to take care of all dead load, wind and erection stresses. Splices will be permitted only where indicated. Erection bolts used in welded construction maybe tightened securely and left in place, if removed, the holes shall be filled with plug welds.

Field Welding

Shall be as specified for shop fabrication of welded construction. Any shop paint on surfaces adjacent to joints to be field-welded shall be wire-brushed to reduce the paint film to a minimum.

Field Painting

All exposed surfaces of steelwork shall be shop painted. Surfaces where the shop coat of paint to be damaged shall be retouched using the same system as the original shop painting.

Surfaces, which will be in contact after erection except when in contact with bolted and welded connections, shall be given one finish coat before erection. The cleaning, pre-treatment and priming of welds and the areas adjacent thereto shall be done promptly after the acceptance of the weld and shall be as specified under the shop painting.

B. FIRE ALARM SYSTEM

- Furnish and install a Fire Alarm system as manufactured by Edwards or approved equal as described in this specification and indicated in the drawings. The system is to be wired and installed in accordance and left in the first class operating conditions.
- Operation: At each stairway, exits and other locations shown in the plans, there shall be non-coded fire alarm station. At each location where shown, there shall be a bell or horn operating in any station and shall cause all sounding devices to operate continuously until the fire alarm station has been restored to normal. It shall also be possible for those in authority to transmit a test signal in any station. The station and sounding devices shall be connected to a control panel, which shall permit a small supervisory current to pass through the entire system. A trouble bell shall also be provided and shall sound continuously in the event of failure of the main power supply source or a ground fault at each installation wearing circuits.
- Equipment: Install where shown a flush non-coded manual fire alarm station. Flush station shall mount on standard outlet boxes with single gang cover.
- Install where shown on plans and under dome vibrating bell. Size and number of signals to be located so that they maybe heard by all occupants of the building.
- The Electrical Contractor shall provide and install smoke detectors, wiring and connection flow switches. The fire alarm panel shall be factory wired to accept this and any other devices specified herein or as shown on the drawings.
- Fire Extinguishers

  Furnish and install eight (8) units of fire extinguishers, brand Stallion, 10 lbs. Per unit, mounted at 1.2 high at locations specified by the Consultant/Architect, four (4) units at the first floor and four (4) units at the second floor.

DIGEST SPECIFICATION

1. Soil Poisoning Mapecon/Chlordane Solution F-3 orF-5 or approved equivalent.

2. Wood Preservation Cuprinol/Solignum or approvedequivalent.

3. Roofing Works 0.40mm thick Long-Span Roofing,Corrugated, Pre-painted

4. Concrete Works a. Portland Cement Island, Republic or any equivalentbrand but consistent

b. Rebars Structural grade conforming toBureau of Product Standard andASTM specifications
c. Tie wires Gauge 16 commercial G.I. wires

5. Masonry Works Non-load Bearing6” THK CHB, 4” THK CHB

6. Finishing Works a. Glazed and Vitrified tiles Vitrified or Ceramic Tiles for toilet wallsand floor, “Mariwasa, Fil-Hispano” orapproved equivalent.
b. Paints “Davies”/”Boysen” Quick-Dry, Latex,Red Lead Primer and Enamel Paintsor approved equivalent.

7. Plumbing Worksa. PPR PN16 (COLD) “Wavin, Thermovar, Bugatti” or approved equivalent with ISOstandard
b. PPR PN20 (HOT) “Wavin, Thermovar, Bugatti” orapproved equivalent with ISOstandard
c. G.I. Pipes “Mayer” Galvanized Iron, Gauge #40 approved equivalent
d. Drainage, Waste, Vent PVC pipes Polyvinyl Chloride for DWV

Systemwith ISO Standard or approvedequivalent.
e. Water Closet “Saniware, Karat”, 1.6 GPF RoundFront or approved equivalent.
f. Lavatory “Saniware Monica, Sarah” Wall-Hung Type Lavatory or approvedequivalent
g. Tissue Holder “Saniware, Sabrina” PorcelainCoated Tissue Holder or approvedequivalent.
h. Faucets “Price Pfister”, Nickel-Plated, Plainor approved equivalent.
i. Floor & Roof drain Stainless Steel, beehive type with detachable stainless strainer.

8. Electrical Worksa. Wires Type as specified, “Columbia”,“Philflex”, American wires & Cables”or approved equivalent.

b. Pipes & Fittings Rigid Steel Conduits (RSC) &Fittings or Intermediate MetalConduit (IMC) & Fiitings: “Nitchi” or approved equivalent.PVC Conduits (Thick-walled type) & Fittings: “Neltex, Emerald, Moldex” orapproved equivalent.
c. Wiring Devices “Panasonic” or approved equivalent. (Convenience Outlet/Switch) Convenience oultet shall be grounding type
d. Lighting Fixture Lamp: T5 “Philips, G.E or approved equivalent.
Ballast: Electronic type
Lampholder: Heavy duty type
e. Pinlight Housing: 6” dia. aluminum withmirrorized reflector“ Lamp: Compact fluorescent, PLtype
f. Panelboard Branch circuit protection: Bolt-ontype (20AT – 70AT) “GE”Westinghouse, “Fuji”, Mitsubishi”,“Square-D” or approved equivalentMain protection: Molded case type(for 100AT and above), OR Bolt-ontype (for 30AT – 70AT) “GE”Westinghouse, “Fuji”, Mitsubishi”,“Square-D”
Enclosure: Dead-front, Nema-1 (forindoor); Nema-3R (for outdoor);flush or surface-mounted with appropriate ground terminals
g. Junction Box 4 x 4 PVC with cover & screw
h. Utility Box 2 x 4 PVC with cover & screw
i. Pull box Size as required; Nema-3R or Ga.#16 with cover and appropriateknock-outs, painted (1 coat primer; 2coats gray paint)

9. Hardwares a. Lock set “Schlage, Alpha”, or approvedequivalent. Lever type forClassroom doors and Toilet door forPerson with Disability (PWD)
b. Door Hinges “Stanley”, Loose pin, wrought steelbutton tip ball, or approvedequivalent.

10. Carpentry Worksa. Panel Doors Tanguile, Kiln Dried (1 ¾” thk.)
b. Flush Doors Hollow core (1 ¾” thk) with Two facemarine plywood, for toilet DoorsTanguile Kiln Dried (1 ¾” thk)
c. Door Jambs 2” x 6” (50mm x 150mm)Tanguile/Guijo/Yacal
d. Windows (Front) Clear Glass panel blades inJalouplus casing with transom(satin-finish) on2” x 6” Tanguile/Guijo sill.
e. Windows (Rear) For Multi-storey; Steel CasementWindows with ¼” thick clear glass
f. Chalkboards ¼” thk. Lawanit Paint Finish on 2”x2”Tanguile, Kiln Dried Studs

Section VI. Specifications

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