

# PHILIPPINE BIDDING DOCUMENTS

# Procurement of INFRASTRUCTURE PROJECTS

Government of the Republic of the Philippines

PROJECT TITLE	<b>DESIGN AND BUILD SERVICES DEMOLITION OF EXISTING STRUCTURES WITHIN PASIG CITY HALL COMPOUND AND CONSTRUCTION OF THE NEW PASIG CITY HALL</b>
LOCATION	<b>CARUNCHO AVENUE, BRGY. SAN NICOLAS, PASIG CITY</b>
PROJECT COMPLETION	<b>720 CALENDAR DAYS</b>
APPROVED BUDGET FOR THE CONTRACT (ABC)	<b>PHP 9,644,918,000.00</b>

**ITB NO. PB-04-03-2024-07**

**Sixth Edition  
July 2020**

# Preface

These Philippine Bidding Documents (PBDs) for the procurement of Infrastructure Projects (hereinafter referred to also as the “Works”) through Competitive Bidding have been prepared by the Government of the Philippines for use by all branches, agencies, departments, bureaus, offices, or instrumentalities of the government, including government-owned and/or -controlled corporations, government financial institutions, state universities and colleges, local government units, and autonomous regional government. The procedures and practices presented in this document have been developed through broad experience, and are for mandatory use in projects that are financed in whole or in part by the Government of the Philippines or any foreign government/foreign or international financing institution in accordance with the provisions of the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.

The PBDs are intended as a model for admeasurements (unit prices or unit rates in a bill of quantities) types of contract, which are the most common in Works contracting.

The Bidding Documents shall clearly and adequately define, among others: (i) the objectives, scope, and expected outputs and/or results of the proposed contract; (ii) the eligibility requirements of Bidders; (iii) the expected contract duration; and (iv) the obligations, duties, and/or functions of the winning Bidder.

Care should be taken to check the relevance of the provisions of the PBDs against the requirements of the specific Works to be procured. If duplication of a subject is inevitable in other sections of the document prepared by the Procuring Entity, care must be exercised to avoid contradictions between clauses dealing with the same matter.

Moreover, each section is prepared with notes intended only as information for the Procuring Entity or the person drafting the Bidding Documents. They shall not be included in the final documents. The following general directions should be observed when using the documents:

- a. All the documents listed in the Table of Contents are normally required for the procurement of Infrastructure Projects. However, they should be adapted as necessary to the circumstances of the particular Project.
- b. Specific details, such as the “*name of the Procuring Entity*” and “*address for bid submission*,” should be furnished in the Instructions to Bidders, Bid Data Sheet, and Special Conditions of Contract. The final documents should contain neither blank spaces nor options.
- c. This Preface and the footnotes or notes in italics included in the Invitation to Bid, BDS, General Conditions of Contract, Special Conditions of Contract, Specifications, Drawings, and Bill of Quantities are not part of the text of the final document, although they contain instructions that the Procuring Entity should strictly follow.
- d. The cover should be modified as required to identify the Bidding Documents as to the names of the Project, Contract, and Procuring Entity, in addition to date of issue.

- e. Modifications for specific Procurement Project details should be provided in the Special Conditions of Contract as amendments to the Conditions of Contract. For easy completion, whenever reference has to be made to specific clauses in the Bid Data Sheet or Special Conditions of Contract, these terms shall be printed in bold typeface on Sections I (Instructions to Bidders) and III (General Conditions of Contract), respectively.
- f. For guidelines on the use of Bidding Forms and the procurement of Foreign-Assisted Projects, these will be covered by a separate issuance of the Government Procurement Policy Board.

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# *Glossary of Terms, Abbreviations, and Acronyms*

**ABC** – Approved Budget for the Contract.

**ARCC** – Allowable Range of Contract Cost.

**BAC** – Bids and Awards Committee.

**Bid** – A signed offer or proposal to undertake a contract submitted by a bidder in response to and in consonance with the requirements of the bidding documents. Also referred to as *Proposal* and *Tender*. (2016 revised IRR, Section 5[c])

**Bidder** – Refers to a contractor, manufacturer, supplier, distributor and/or consultant who submits a bid in response to the requirements of the Bidding Documents. (2016 revised IRR, Section 5[d])

**Bidding Documents** – The documents issued by the Procuring Entity as the bases for bids, furnishing all information necessary for a prospective bidder to prepare a bid for the Goods, Infrastructure Projects, and/or Consulting Services required by the Procuring Entity. (2016 revised IRR, Section 5[e])

**BIR** – Bureau of Internal Revenue.

**BSP** – Bangko Sentral ng Pilipinas.

**CDA** – Cooperative Development Authority.

**Consulting Services** – Refer to services for Infrastructure Projects and other types of projects or activities of the GOP requiring adequate external technical and professional expertise that are beyond the capability and/or capacity of the GOP to undertake such as, but not limited to: (i) advisory and review services; (ii) pre-investment or feasibility studies; (iii) design; (iv) construction supervision; (v) management and related services; and (vi) other technical services or special studies. (2016 revised IRR, Section 5[i])

**Contract** – Refers to the agreement entered into between the Procuring Entity and the Supplier or Manufacturer or Distributor or Service Provider for procurement of Goods and Services; Contractor for Procurement of Infrastructure Projects; or Consultant or Consulting Firm for Procurement of Consulting Services; as the case may be, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

**Contractor** – is a natural or juridical entity whose proposal was accepted by the Procuring Entity and to whom the Contract to execute the Work was awarded. Contractor as used in these Bidding Documents may likewise refer to a supplier, distributor, manufacturer, or consultant.

**CPI** – Consumer Price Index.

**DOLE** – Department of Labor and Employment.

**DTI** – Department of Trade and Industry.

**Foreign-funded Procurement or Foreign-Assisted Project** – Refers to procurement whose funding source is from a foreign government, foreign or international financing institution as specified in the Treaty or International or Executive Agreement. (2016 revised IRR, Section 5[b]).

**GFI** – Government Financial Institution.

**GOCC** – Government-owned and/or –controlled corporation.

**Goods** – Refer to all items, supplies, materials and general support services, except Consulting Services and Infrastructure Projects, which may be needed in the transaction of public businesses or in the pursuit of any government undertaking, project or activity, whether in the nature of equipment, furniture, stationery, materials for construction, or personal property of any kind, including non-personal or contractual services such as the repair and maintenance of equipment and furniture, as well as trucking, hauling, janitorial, security, and related or analogous services, as well as procurement of materials and supplies provided by the Procuring Entity for such services. The term “related” or “analogous services” shall include, but is not limited to, lease or purchase of office space, media advertisements, health maintenance services, and other services essential to the operation of the Procuring Entity. (2016 revised IRR, Section 5[r])

**GOP** – Government of the Philippines.

**Infrastructure Projects** – Include the construction, improvement, rehabilitation, demolition, repair, restoration or maintenance of roads and bridges, railways, airports, seaports, communication facilities, civil works components of information technology projects, irrigation, flood control and drainage, water supply, sanitation, sewerage and solid waste management systems, shore protection, energy/power and electrification facilities, national buildings, school buildings, hospital buildings, and other related construction projects of the government. Also referred to as *civil works or works*. (2016 revised IRR, Section 5[u])

**LGUs** – Local Government Units.

**NFCC** – Net Financial Contracting Capacity.

**NGA** – National Government Agency.

**PCAB** – Philippine Contractors Accreditation Board.

**PhilGEPS** - Philippine Government Electronic Procurement System.

**Procurement Project** – refers to a specific or identified procurement covering goods, infrastructure project or consulting services. A Procurement Project shall be described, detailed, and scheduled in the Project Procurement Management Plan prepared by the agency which shall be consolidated in the procuring entity's Annual Procurement Plan. (GPPB Circular No. 06-2019 dated 17 July 2019)

**PSA** – Philippine Statistics Authority.

**SEC** – Securities and Exchange Commission.

**SLCC** – Single Largest Completed Contract.

**UN** – United Nations.



## ***Section I. Invitation to Bid***

### **Notes on the Invitation to Bid**

The Invitation to Bid (IB) provides information that enables potential Bidders to decide whether to participate in the procurement at hand. The IB shall be posted in accordance with Section 21.2 of the 2016 revised IRR of RA No. 9184.

Apart from the essential items listed in the Bidding Documents, the IB should also indicate the following:

- a. The date of availability of the Bidding Documents, which shall be from the time the IB is first advertised/posted until the deadline for the submission and receipt of bids;
- b. The place where the Bidding Documents may be acquired or the website where it may be downloaded;
- c. The deadline for the submission and receipt of bids; and
- d. Any important bid evaluation criteria.

The IB should be incorporated into the Bidding Documents. The information contained in the IB must conform to the Bidding Documents and in particular to the relevant information in the Bid Data Sheet.



## Invitation to Bid for the

### ***DESIGN AND BUILD SERVICES (DEMOLITION OF EXISTING STRUCTURES WITHIN PASIG CITY HALL COMPOUND AND CONSTRUCTION OF THE NEW PASIG CITY HALL, CARUNCHO AVE., BRGY. SAN NICOLAS, PASIG CITY)***

1. The *City Government of Pasig*, through the *Annual or Supplemental Budget approved by the Sangguniang Panlungsod* intends to apply the sum of **PhP 9,644,918,000.00** being the Approved Budget for the Contract (ABC) to payments under the contract for **DESIGN AND BUILD SERVICES (DEMOLITION OF EXISTING STRUCTURES WITHIN PASIG CITY HALL COMPOUND AND CONSTRUCTION OF THE NEW PASIG CITY HALL, CARUNCHO AVE., BRGY. SAN NICOLAS, PASIG CITY) under ITB No. PB-04-03-2024-07.** Bids received in excess of the ABC shall be automatically rejected at bid opening.
2. The *City Government of Pasig* now invites bids for the above Procurement Project. Completion of the Works is required **720 Calendar Days (C.D.)**. Bidders should have completed a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II (Instructions to Bidders).
3. Bidding will be conducted through open competitive bidding procedures using non-discretionary “*pass/fail*” criterion as specified in the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.
4. Interested bidders may obtain further information from [*insert name of the Procuring Entity*] and inspect the Bidding Documents at the address given below from [*insert office hours*].
5. A complete set of Bidding Documents may be acquired by interested bidders on 15 MARCH 2024 from given address and website/s below {*Insert if necessary: and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of PhP 75,000.00.* The Procuring Entity shall allow the bidder to present its proof of payment for the fees presented in person.
6. The *City Government of Pasig* will hold a Pre-Bid Conference<sup>1</sup> on 10:00 A.M. 22 MARCH 2024 at 7<sup>th</sup> Floor Meeting Room, Pasig City Hall, Caruncho Ave., San Nicolas, Pasig City, which shall be open to prospective bidders.

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<sup>1</sup> May be deleted in case the ABC is less than One Million Pesos (PhP1,000,000) where the Procuring Entity may not hold a pre-bid conference.

7. Bids must be duly received by the Procurement Management Office (BAC Secretariat Office) through manual submission at the office address as indicated below on or before 9:30 A.M. *03 APRIL 2024*. **Late bids shall not be accepted.**
8. All bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in **ITB** Clause 15.
9. Bid opening shall be on *03 APRIL 2024 at 10:00 A.M.* at the given address below. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.
10. The address for submission of bids is at the Procurement Management Office (BAC Secretariat Office), 4<sup>th</sup> Floor Pasig City Hall Caruncho Avenue, San Nicolas Pasig City.

*Each Bidder shall submit **ONE (1) SEALED MOTHER ENVELOPE** containing:*

1. **ORIGINAL (SEALED AND LABELED)**

*1.1 Hard Copy Original Technical Components;*

*1.2 Hard Copy Original Financial Components and*

*1.3 One (1) **USB Flash Drive** containing scanned P.D.F. Documents of the Original Technical Components and Original Financial Components.*

2. **COPY 1 (SEALED AND LABELED)**

*2.1 One (1) **USB Flash Drive** or **CD** sealed and labeled as "**COPY 1**" containing scanned P.D.F Documents of Technical and Financial Components.*

11. The **City Government of Pasig** reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35.6 and 41 of the 2016 revised Implementing Rules and Regulations (IRR) of RA No. 9184, without thereby incurring any liability to the affected bidder or bidders.
12. For further information, please refer to:

**ATTY. BEA THERESE P. VILLANUEVA**

*Officer in Charge, Procurement Management Office*

**CITY GOVERNMENT OF PASIG**

Procurement Management Office, 4th Floor, Pasig City Hall,

Caruncho Ave., San Nicolas Pasig City

bidsandawards@pasigcity.gov.ph

8643-1111 loc. 1461

13. You may visit the following websites:

For downloading of Bidding Documents:

*PS-PhilGEPS Website at <http://notices.philgeps.gov.ph/> ; and*

City Government of Pasig Website at <https://www.pasigcity.gov.ph/full-disclosure-portal>

15 MARCH 2024

SGD.

**ATTY. JOSEPHINE C. LATI-BAGAOISAN**

*Chairperson, Bids and Awards Committee*

## ***Section II. Instructions to Bidders***

### **Notes on the Instructions to Bidders**

This Section on the Instruction to Bidders (ITB) provides the information necessary for bidders to prepare responsive bids, in accordance with the requirements of the Procuring Entity. It also provides information on bid submission, eligibility check, opening and evaluation of bids, post-qualification, and on the award of contract.

## 1. Scope of Bid

The Procuring Entity, *City Government of Pasig*, invites Bids for the ***DESIGN AND BUILD SERVICES (DEMOLITION OF EXISTING STRUCTURES WITHIN PASIG CITY HALL COMPOUND AND CONSTRUCTION OF THE NEW PASIG CITY HALL, CARUNCHO AVE., BRGY. SAN NICOLAS, PASIG CITY)*** with Project Identification Number ***ITB No. PB-04-03-2024-07***.

The Procurement Project (referred to herein as “Project”) is for the construction of Works, as described in Section VI (Specifications).

## 2. Funding Information

2.1. The GOP through the source of funding as indicated below for ***CY 2024*** in the amount of ***Php9,644,918.00.00***.

2.2. The source of funding is: ***LGUs, the Annual or Supplemental Budget, as approved by the Sanggunian***.

## 3. Bidding Requirements

The Bidding for the Project shall be governed by all the provisions of RA No. 9184 and its 2016 revised IRR, including its Generic Procurement Manual and associated policies, rules and regulations as the primary source thereof, while the herein clauses shall serve as the secondary source thereof.

Any amendments made to the IRR and other GPPB issuances shall be applicable only to the ongoing posting, advertisement, or invitation to bid by the BAC through the issuance of a supplemental or bid bulletin.

The Bidder, by the act of submitting its Bid, shall be deemed to have inspected the site, determined the general characteristics of the contracted Works and the conditions for this Project, such as the location and the nature of the work; (b) climatic conditions; (c) transportation facilities; (c) nature and condition of the terrain, geological conditions at the site communication facilities, requirements, location and availability of construction aggregates and other materials, labor, water, electric power and access roads; and (d) other factors that may affect the cost, duration and execution or implementation of the contract, project, or work and examine all instructions, forms, terms, and project requirements in the Bidding Documents.

## 4. Corrupt, Fraudulent, Collusive, Coercive, and Obstructive Practices

The Procuring Entity, as well as the Bidders and Contractors, shall observe the highest standard of ethics during the procurement and execution of the contract. They or through an agent shall not engage in corrupt, fraudulent, collusive, coercive, and obstructive practices defined under Annex “I” of the 2016 revised IRR of RA No. 9184 or other integrity violations in competing for the Project.

## 5. Eligible Bidders

- 5.1. Only Bids of Bidders found to be legally, technically, and financially capable will be evaluated.
- 5.2. The Bidder must have an experience of having completed a Single Largest Completed Contract (SLCC) that is similar to this Project, equivalent to at least fifty percent (50%) of the ABC adjusted, if necessary, by the Bidder to current prices using the PSA's CPI, except under conditions provided for in Section 23.4.2.4 of the 2016 revised IRR of RA No. 9184.  
  
A contract is considered to be "similar" to the contract to be bid if it has the major categories of work stated in the **BDS**.
- 5.3. For Foreign-funded Procurement, the Procuring Entity and the foreign government/foreign or international financing institution may agree on another track record requirement, as specified in the Bidding Document prepared for this purpose.
- 5.4. The Bidders shall comply with the eligibility criteria under Section 23.4.2 of the 2016 IRR of RA No. 9184.

## 6. Origin of Associated Goods

There is no restriction on the origin of Goods other than those prohibited by a decision of the UN Security Council taken under Chapter VII of the Charter of the UN.

## 7. Subcontracts

- 7.1. The Bidder may subcontract portions of the Project to the extent allowed by the Procuring Entity as stated herein, but in no case more than fifty percent (50%) of the Project.

The City Government of Pasig has prescribed that:

- a. Subcontracting is allowed. The portions of Project and the maximum percentage allowed to be subcontracted are indicated in the **BDS**, which shall not exceed fifty percent (50%) of the contracted Works.
- 7.2. The Bidder must submit together with its Bid the documentary requirements of the subcontractor(s) complying with the eligibility criterial stated in **ITB** Clause 5 in accordance with Section 23.4 of the 2016 revised IRR of RA No. 9184 pursuant to Section 23.1 thereof.

- 7.3. The Supplier may identify its subcontractor during the contract implementation stage. Subcontractors identified during the bidding may be changed during the implementation of this Contract. Subcontractors must submit the documentary requirements under Section 23.1 of the 2016 revised IRR of RA No. 9184 and comply with the eligibility criteria specified in **ITB** Clause 5 to the implementing or end-user unit.
- 7.4. Subcontracting of any portion of the Project does not relieve the Contractor of any liability or obligation under the Contract. The Supplier will be responsible for the acts, defaults, and negligence of any subcontractor, its agents, servants, or workmen as fully as if these were the Contractor's own acts, defaults, or negligence, or those of its agents, servants, or workmen.

## **8. Pre-Bid Conference**

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time at its physical address as indicated in paragraph 6 of the **IB**.

## **9. Clarification and Amendment of Bidding Documents**

Prospective bidders may request for clarification on and/or interpretation of any part of the Bidding Documents. Such requests must be in writing and received by the Procuring Entity, either at its given address or through electronic mail indicated in the **IB**, at least ten (10) calendar days before the deadline set for the submission and receipt of Bids.

## **10. Documents Comprising the Bid: Eligibility and Technical Components**

- 10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Section IX. Checklist of Technical and Financial Documents**.
- 10.2. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines. For Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an apostille pursuant to GPPB Resolution No. 13-2019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.
- 10.3. A valid special PCAB License in case of Joint Ventures, and registration for the type and cost of the contract for this Project. Any additional type of Contractor license or permit shall be indicated in the **BDS**.
- 10.4. A List of Contractor's key personnel (e.g., Project Manager, Project Engineers, Materials Engineers, and Foremen) assigned to the contract to be bid, with their complete qualification and experience data shall be provided.



These key personnel must meet the required minimum years of experience set in the **BDS**.

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

## **11. Documents Comprising the Bid: Financial Component**

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

## **12. Alternative Bids**

Bidders shall submit offers that comply with the requirements of the Bidding Documents, including the basic technical design as indicated in the drawings and specifications. Unless there is a value engineering clause in the **BDS**, alternative Bids shall not be accepted.

## **13. Bid Prices**

All bid prices for the given scope of work in the Project as awarded shall be considered as fixed prices, and therefore not subject to price escalation during contract implementation, except under extraordinary circumstances as determined by the NEDA and approved by the GPPB pursuant to the revised Guidelines for Contract Price Escalation guidelines.

## **14. Bid and Payment Currencies**

- 14.1. Bid prices may be quoted in the local currency or tradeable currency accepted by the BSP at the discretion of the Bidder. However, for purposes of bid evaluation, Bids denominated in foreign currencies shall be converted to Philippine currency based on the exchange rate as published in the BSP reference rate bulletin on the day of the bid opening.
- 14.2. Payment of the contract price shall be made in Philippine Pesos.

## **15. Bid Security**

- 15.1. The Bidder shall submit a Bid Securing Declaration or any form of Bid Security in the amount indicated in the **BDS**, which shall be not less than the percentage of the ABC in accordance with the schedule in the **BDS**.
- 15.2. The Bid and bid security shall be valid until *[indicate date]*. Any bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

## **16. Sealing and Marking of Bids**

Each Bidder shall submit one copy of the first and second components of its Bid.

The Procuring Entity may request additional hard copies and/or electronic copies of the Bid. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification.

If the Procuring Entity allows the submission of bids through online submission to the given website or any other electronic means, the Bidder shall submit an electronic copy of its Bid, which must be digitally signed. An electronic copy that cannot be opened or is corrupted shall be considered non-responsive and, thus, automatically disqualified.

## **17. Deadline for Submission of Bids**

The Bidders shall submit on the specified date and time and either at its physical address or through online submission as indicated in paragraph 7 of the **IB**.

## **18. Opening and Preliminary Examination of Bids**

- 18.1. The BAC shall open the Bids in public at the time, on the date, and at the place specified in paragraph 9 of the **IB**. The Bidders' representatives who are present shall sign a register evidencing their attendance. In case videoconferencing, webcasting or other similar technologies will be used, attendance of participants shall likewise be recorded by the BAC Secretariat.

In case the Bids cannot be opened as scheduled due to justifiable reasons, the rescheduling requirements under Section 29 of the 2016 revised IRR of RA No. 9184 shall prevail.

- 18.2. The preliminary examination of Bids shall be governed by Section 30 of the 2016 revised IRR of RA No. 9184.

## **19. Detailed Evaluation and Comparison of Bids**

- 19.1. The Procuring Entity's BAC shall immediately conduct a detailed evaluation of all Bids rated "*passed*" using non-discretionary pass/fail criteria. The BAC shall consider the conditions in the evaluation of Bids under Section 32.2 of 2016 revised IRR of RA No. 9184.

- 19.2. If the Project allows partial bids, all Bids and combinations of Bids as indicated in the **BDS** shall be received by the same deadline and opened and evaluated simultaneously so as to determine the Bid or combination of Bids offering the lowest calculated cost to the Procuring Entity. Bid Security as required by **ITB** Clause 15 shall be submitted for each contract (lot) separately.
- 19.3. In all cases, the NFCC computation pursuant to Section 23.4.2.6 of the 2016 revised IRR of RA No. 9184 must be sufficient for the total of the ABCs for all the lots participated in by the prospective Bidder.

## **20. Post Qualification**

Within a non-extendible period of five (5) calendar days from receipt by the Bidder of the notice from the BAC that it submitted the Lowest Calculated Bid, the Bidder shall submit its latest income and business tax returns filed and paid through the BIR Electronic Filing and Payment System (eFPS), and other appropriate licenses and permits required by law and stated in the **BDS**.

## **21. Signing of the Contract**

The documents required in Section 37.2 of the 2016 revised IRR of RA No. 9184 shall form part of the Contract. Additional Contract documents are indicated in the **BDS**.

## **Additional Instructions to Bidders**

Project Title: **DESIGN AND BUILD SERVICES (DEMOLITION OF EXISTING STRUCTURES WITHIN PASIG CITY HALL COMPOUND AND CONSTRUCTION OF THE NEW PASIG CITY HALL, CARUNCHO AVE., BRGY. SAN NICOLAS, PASIG CITY**

Project Identification Number: **ITB No. PB-04-03-2024-07**

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This shall form an integral part of the Bid Documents.

A. Bidders are requested to organize and submit their bids on the following requirements:

1. Submit First (1<sup>st</sup>) Envelope containing one (1) hardcopy of the ORIGINAL Technical Component, including the Eligibility Requirements. 1<sup>st</sup> Envelope shall be sealed and labeled as “ORIGINAL TECHNICAL COMPONENT”.
2. Submit Second (2<sup>nd</sup>) Envelope containing one (1) hard copy of the ORIGINAL Financial Component. 2<sup>nd</sup> Envelope shall be sealed and labeled as “ORIGINAL FINANCIAL COMPONENT”.
3. Submit USB Flash Drive containing one (1) soft/scanned copy of the ORIGINAL Technical Component and Financial Component;
4. Note: The 1st Envelope, 2nd Envelope and the USB flash drive containing the soft/scanned copy of the original technical and financial components shall be enclosed in a single envelope, sealed and labeled as “ORIGINAL BID”.
5. Submit USB Flash Drive containing one (1) soft/scanned copy of the Technical Component and Financial Component. USB flash drive shall be enclosed in a separate envelope, sealed and labeled as “COPY1”.
6. The “ORIGINAL BID” and “COPY 1” envelopes shall be enclosed in a single MOTHER ENVELOPE sealed and properly labeled.

\*Sections of the bid shall be separated by dividers, proper tabs;

\*NO scratch papers.

All envelopes (1st Envelope, 2nd Envelope, Original Bid Envelope, Copy 1 Envelope and Mother Envelope) shall be labeled as follows:

- Addressed to the procuring entity’s BAC Chairperson
- Name of the project/contract to be bid
- Name, address and contact details of the bidder including e-mail address
- “DO NOT OPEN BEFORE <bid opening date and time>”
- Unsealed or unmarked bid envelopes shall be rejected. However, bid envelopes that are not properly sealed and marked, as required in the

bidding documents, shall be accepted, provided that the bidder or its duly authorized representative shall acknowledge such condition of the bid as submitted. The Procuring Entity shall not be responsible for misplaced Bidding Documents and premature opening.

**B. Bidding Documents availability and fee:**

- Bidding Documents is available from 15 MARCH 2024 to 03 APRIL 2024 UNTIL 9:30 A.M. upon payment of applicable fees for the Bidding Documents at the City Treasurer’s Office. Standard rates for bidding documents are as follows:

Approved Budget for the Contract	Maximum Cost of Bidding Documents
500,000 and below	P500.00
More than 500,000 up to 1 million	1,000.00
More than 1 million up to 5 million	5,000.00
More than 5 million up to 10 million	10,000.00
More than 10 million up to 50 million	25,000.00
More than 50 million up to 500 million	50,000.00
More than 500 million	75,000.00

- Bidders shall pay the applicable fee for the Bidding Documents not later than the submission of their bids.

**C. Instruction to Bidders on payment of Bidding Documents**

- Secure Order of Payment for the bidding documents at the Procurement Management Office, 4th Floor Pasig City Hall.
- Proceed to City Treasurer’s Office, 1st Floor Pasig City Hall for the payment of bidding documents.
- Mode of payment: Cashier Manager’s/Cashier’s Check payable to City Government of Pasig. **Personal Check shall not be accepted.**
- Present the Official Receipt to the BAC Secretariat’s Office for the release of the complete set of bidding documents.

**D. REMINDERS:**

- The deadline for the submission of bid is on 03 April 2024 at 9:30 AM at the Procurement Management Office, 4th Floor Pasig City Hall, Caruncho Ave., San Nicolas Pasig City. The digital clock at the Procurement Management Office that is set to the Philippine Time (PhST) shall be used as reference in determining the time for the submission of bids, hence, participating bidders are advised to synchronize their timepiece with the said digital clock. Late bids or those who submitted after 9:30 AM of 03 April 2024 shall not be accepted.

- Bidders may submit their bid documents days ahead of the deadline for the submission in order to avoid late submission.
- Bid opening shall be on 03 April 2024 at 10:00 AM at 7th Floor Meeting Room, Pasig City Hall, Caruncho Ave., San Nicolas Pasig City. Bids will be opened in the presence of the bidders' representatives who choose to attend.
- All licenses, permits and other required clearances should be valid at the time of the submission of bids, Post-Qualification Evaluation and signing of the contract.
- The BAC expects the bidders to exercise due diligence in going through the bid documents so that they can prepare their bids intelligently.
- The Bids and Awards Committee will still continue to implement social distancing and shall require only one (1) Representative per company.
- All attendees will be subjected to thermal scan prior to entry of the venue and shall:
  1. Wear medical face mask and face shield at all times – “No Mask No Entry”
  2. Bring black ballpen
  3. Bring alcohol

**Please be reminded that all queries after the issuance of Bid Bulletin will not be entertained.**

**SGD.**  
**ATTY. JOSEPHINE C. LATI-BAGAOISAN**  
BAC Chairperson

## *Section III. Bid Data Sheet*

### **Notes on the Bid Data Sheet (BDS)**

The Bid Data Sheet (BDS) consists of provisions that supplement, amend, or specify in detail, information, or requirements included in the ITB found in Section II, which are specific to each procurement.

This Section is intended to assist the Procuring Entity in providing the specific information in relation to corresponding clauses in the ITB and has to be prepared for each specific procurement.

The Procuring Entity should specify in the BDS information and requirements specific to the circumstances of the Procuring Entity, the processing of the procurement, and the bid evaluation criteria that will apply to the Bids. In preparing the BDS, the following aspects should be checked:

- a. Information that specifies and complements provisions of the ITB must be incorporated.
- b. Amendments and/or supplements, if any, to provisions of the ITB as necessitated by the circumstances of the specific procurement, must also be incorporated.

# Bid Data Sheet

ITB Clause	
5	<p>Pursuant to Annex G No. 9.2 of the revised IRR of RA No. 9184, a modified set of requirements integrating eligibility documents and criteria for infrastructure projects and consulting services shall be adopted, as follows:</p> <ol style="list-style-type: none"> <li>1. Class “A” Documents (Legal, Technical and Financial Documents) and Class “B” Documents. <p style="margin-left: 40px;">The prospective bidder shall submit all the required Class “A” and Class “B” documents for infrastructure projects and the following:</p> <ol style="list-style-type: none"> <li>a. relevant statements of all on-going, completed, awarded but not yet started design/design and build related contracts, curriculum vitae of key staff, partners or principal officers; and</li> <li>b. valid licenses issued by the Professional Regulatory Commission (PRC) for design professionals.</li> </ol> </li> <li>2. Eligibility Criteria <ol style="list-style-type: none"> <li>a. The eligibility of design and build contractors shall be based on the legal, technical and financial requirements abovementioned. In the technical requirements, the design and build contractor (as solo or in joint venture/consortia) should be able to comply with the experience requirement under the IRR of R.A. 9184, where one of the parties (in a joint venture/consortia) should have at least one similar project, both in design and construction, with at least 50% of the cost of the ABC.</li> <li>b. If the bidder has no experience in design and build projects on its own it may enter into subcontracting, partnerships, or joint venture with design or engineering firms for the design portion of the contract.</li> <li>c. The relevant provisions under Section 23.4.2 of the IRR of RA No. 9184 on eligibility requirements shall be observed, with the following exceptions: <p style="margin-left: 40px;">Joint ventures/consortia among Filipino contractors and consultants or among Filipino contractors and foreign consultants shall be allowed subject to pertinent laws and the relevant provisions of the IRR of R.A. 9184. The joint venture/consortia shall be jointly and severally responsible for the obligations and the civil liabilities arising from the design and build contract: Provided, however, That Filipino ownership or interest thereof shall be at least seventy five percent (75%): Provided further, That joint ventures/consortia in which Filipino ownership or interest is less than seventy-five percent (75%) may be eligible where the structures to be built require the application of</p> </li> </ol> </li> </ol>



	<p>techniques and/or technologies which are not adequately possessed by Filipinos and that Filipino ownership or interest shall not be less than twenty-five percent (25%): Provided, finally, that when the design services in which the joint venture wishes to engage involve the practice of professions regulated by law, all those who will actually perform the services shall be Filipino citizens and registered professionals authorized by the appropriate regulatory body to practice those professions and allied professions and where foreign designers are required, the foreign designer must be authorized by the appropriate Philippine Government professional regulatory body to engage in the practice of those professions and allied professions.</p>
5.2	<p>For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be:</p> <p>Design, Build, Operation and Maintenance of Government Offices, Structures, and Facilities with at least 50% of the ABC completed within the last ten (10) years prior to the deadline of submission and receipt of bids of at least 50% of the Approved Budget for the Contract (ABC)</p>
7.1	<p>Subcontracting is allowed.</p> <p>Subcontracting for the project’s design phase (Detailed Engineering Design) is allowed provided that the amount should not exceed 10% of the contract price. Designer must successfully or substantially completed the design of a project similar in nature and complexity as this contract under bidding and shall have earned a fee amounting to at least 50% of the ABC of the design component.</p>
10.1	<p>For the procurement of Infrastructure Project, the first envelope shall contain the following technical information/documents:</p> <ol style="list-style-type: none"> <li>1. <i>PhilGEPS Certificate of Registration and membership in accordance with Section 8.5.2 of this IRR. For procurement to be performed overseas, it shall be subject to the Guidelines to be issued by the GPPB.</i></li> <li>2. <i>PCAB License and Registration <b>or</b> Special PCAB License in case of Joint Ventures. Bidders must have a valid Philippine Contractors Accreditation Board (PCAB) license and registration for Size Range – <b><u>Large B- Building &amp; Industrial Plant</u></b> and License Category of at least: <b><u>General Building- AAA</u></b></i></li> <li>3. <i>Statement of all Ongoing Government and Private Contracts;</i></li> <li>4. <i>Statement of SLCC;</i></li> <li>5. <i>NFCC Computation;</i></li> <li>6. <i>JVA, if applicable;</i></li> <li>7. <i>Bid security in the prescribed form, amount and validity period;</i></li> <li>8. <i>Project Requirements, which shall include the following:</i> <ol style="list-style-type: none"> <li>(1) <i>Organizational chart for the contract to be bid;</i></li> <li>(2) <i>List of contractor’s personnel (e.g., Project Manager, Project Engineers, Materials Engineers, and Foremen), to be assigned to the</i></li> </ol> </li> </ol>

- contract to be bid, with their complete qualification and experience data;*
- (3) List of contractor’s major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be;*
- (4) Duly signed Manpower Schedule;*
- (5) Equipment utilization schedule;*
- (6) Duly signed Construction Schedule (PERT/CPM) and S-curve;*
- (7) Duly signed Construction Method in narrative form;*
- (8) Construction Safety and Health Program; and*
- (9) Additional documents pursuant to Annex G:*
- (9.1) Preliminary Conceptual Design Plans in accordance with the degree of details specified by the procuring entity;*
- > Cover Sheet*
  - > General Index*
  - > Vicinity and Key Map*
  - > Location plan/ Lay out*
  - > Legend, Abbreviation and Symbols*
  - > General Notes*
  - > Perspective Views*
  - > Building Design Plan including floor plans, sections, and elevations*
  - > Site Development Plan*
  - > Engineering Plans, Layout, and Schematic Diagram*
- (9.2) Design and construction methods;*
- (9.3) List of design and construction personnel, to be assigned to the contract to be bid, with their complete qualification and experience data;*
- (9.4) Value engineering analysis of design and construction method*
- (9.5) Relevant statements of all on-going, completed, awarded but not yet started design/design and build related contracts, curriculum vitae of key personnel, staff, partners or principal officers;*
- (9.6) Valid licenses issued by the Professional Regulatory Commission (PRC) for design professionals; and*
- 9. Omnibus Sworn Statement in accordance with Section 25.3 of this IRR*

10.3 *[Specify if another Contractor license or permit is required.] No instruction.*

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

**1. DESIGN PERSONNEL**

KEY PERSONNEL	QTY	GENERAL EXPERIENCE	RELEVANT EXPERIENCE	QUALIFICATIONS
Design Architect	1	15 Years	10 Years	A licensed Architect with experience of Designing Government Buildings focusing on the Philippine Architecture with Sustainable Design Solutions; With Doctorate Degree; and Has been globally

				recognized and acknowledge.
Structural Design Engineer	1	15 Years	5 Years	A licensed Civil Engineer; ASEP member; and With Masteral on Structural Engineering.
Mechanical Design Engineer	1	15 Years	5 Years	A licensed Professional Mechanical Engineer
Electrical and Electronics Design Engineer	1	15 Years	5 Years	A licensed Professional Electrical and Electronics Engineer
Sanitary/ Plumbing Design Engineer	1	15 Years	5 Years	A licensed Sanitary Engineer

**2. CONSTRUCTION PERSONNEL**

KEY PERSONNEL	QTY	GENERAL EXPERIENCE	RELEVANT EXPERIENCE	QUALIFICATIONS
Project Manager	1	15 Years	10 Years	A licensed Civil Engineer with experience of construction a multi-storey Government Building
Project Civil Engineer	1	10 Years	5 Years	A licensed Civil Engineer
Project Architect	1	10 Years	5 Years	A licensed Architect
Electrical and Electronics Engineer	1	10 Years	5 Years	A licensed Professional Electrical and Electronics Engineer
Mechanical Engineer	1	10 Years	5 Years	A licensed Professional Mechanical Engineer
Sanitary/ Plumbing Engineer	1	10 Years	5 Years	A licensed Sanitary Engineer
Health and Safety Engineer	1	10 Years	5 Years	With COSH Training conducted by DOLE
Property Manager	1	10 Years	10 Years	Must have experience in property management related to property of Government Building with mixed-used developments, buildings, and parks including mechanical, electrical, fire protection system / equipment

The Bidder shall submit the corresponding Curriculum Vitae (CV) of the above key personnel that includes description of his/her relevant experience. **The CV shall include a statement of availability of the key personnel for the duration of the project**, signed by the named key personnel. The key personnel can be a current or on-call employee, or a consultant of the company.

10.5	<p>The minimum major equipment requirements are the following:</p> <table border="1"> <thead> <tr> <th><u>EQUIPMENT</u></th> <th><u>CAPACITY/ SPECIFICATIONS</u></th> <th><u>NUMBER OF UNITS</u></th> </tr> </thead> <tbody> <tr> <td>Backhoe Hydraulic Excavator</td> <td>W.M. 0.50 cu.m.</td> <td>2</td> </tr> <tr> <td>Backhoe with attachment</td> <td>0.50 – 1.00 cu.m.</td> <td>3</td> </tr> <tr> <td>Dump Truck</td> <td>9 – 10 cu.m.</td> <td>6</td> </tr> <tr> <td>Personnel Service Vehicle / Truck</td> <td>-</td> <td>2</td> </tr> <tr> <td>Generator Set</td> <td>350 kw</td> <td>2</td> </tr> <tr> <td>Truck mounted crane</td> <td>25 toner</td> <td>1</td> </tr> <tr> <td>Concrete Vibrator</td> <td>-</td> <td>4</td> </tr> <tr> <td>Plate Compactor</td> <td>-</td> <td>2</td> </tr> <tr> <td>Welding machine</td> <td>300 amp</td> <td>6</td> </tr> <tr> <td>One-Bagger Mixer</td> <td>-</td> <td>4</td> </tr> <tr> <td>Tower Crane</td> <td>-</td> <td>1</td> </tr> </tbody> </table>	<u>EQUIPMENT</u>	<u>CAPACITY/ SPECIFICATIONS</u>	<u>NUMBER OF UNITS</u>	Backhoe Hydraulic Excavator	W.M. 0.50 cu.m.	2	Backhoe with attachment	0.50 – 1.00 cu.m.	3	Dump Truck	9 – 10 cu.m.	6	Personnel Service Vehicle / Truck	-	2	Generator Set	350 kw	2	Truck mounted crane	25 toner	1	Concrete Vibrator	-	4	Plate Compactor	-	2	Welding machine	300 amp	6	One-Bagger Mixer	-	4	Tower Crane	-	1
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Tower Crane	-	1																																			
11	<p>The second envelope (Financial Proposal) shall contain all the required documents for infrastructure projects under Section 25.3 of the IRR of R.A 9184 and the following additional documents:</p> <ol style="list-style-type: none"> <li>1. Lump sum bid prices, which shall include the detailed engineering cost, in the prescribed Bid Form;</li> <li>2. Detailed estimates including a summary sheet indicating the unit prices of construction materials, labor rates and equipment rentals used in coming up with the bid; and</li> <li>3. Cash flow by the quarter and payments schedule.</li> </ol>																																				
12	<p><i>[Insert Value Engineering clause if allowed.]</i></p> <p><i>Value Engineering Studies</i></p> <p>&gt; Information Phase - the activities include Project information gathering and investigation and performing functional analysis of systems and subsystems to identify high cost areas of the project</p> <p>&gt; Speculative/Creative Phase - involves developing effective and efficient group interaction process (brainstorming) to identify alternative ideas, proposals and solutions for accomplishing the function of a system or subsystem</p> <p>&gt; Evaluation/Analytical Phase - the Contractor shall evaluate and analyze process to determine which ideas, solutions and measures would show greater potential for cost savings and project improvement</p> <p>&gt; Development/Recommendation Phase - Activities under this phase include description of project components, preparation of sketches, and estimations of life cycle cost to be used in justifying and supporting value engineering recommendations</p> <p>&gt; Report or Presentation Phase - the Contractor shall prepare and present its report shall contain information such as but not limited to list of items or</p>																																				

	<p>processes examined, alternatives, functional and the life cycle analyses, value engineering proposals and supporting information</p> <p>&gt; Design Analysis and Computation</p> <p>&gt; Sources of Construction Materials</p>
15.1	<p>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:</p> <p>a. The amount of not less than <i>two percent (2%) of ABC</i>, if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit;</p> <p>b. The amount of not less than <i>five percent (5%) of ABC</i>, if bid security is in Surety Bond.</p>
19.2	No instructions.
20	<p><i>[List licenses and permits relevant to the Project and the corresponding law requiring it, e.g. Environmental Compliance Certificate, Certification that the project site is not within a geohazard zone, etc.]</i></p> <p>The following licenses/s and permit/s shall be required:</p> <ol style="list-style-type: none"> <li>1. Registration certificate form Securities and Exchange Commission (SEC), Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives of its equivalent document</li> <li>2. Mayor's or Business permit issued by the city or municipality where the principal place of business of the prospective bidder is located.</li> <li>3. Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR)</li> <li>4. Valid PCAB License Category: General Building- AAAA and AAA and Registration of at least Large B- Building &amp; Industrial Plant</li> <li>5. The prospective bidder's audited financial statements, showing, among others, the prospective bidder's total and current assets and liabilities, stamped "received" by the BIR or its duly accredited and authorized institutions, for the preceding calendar year which should not be earlier than two (2) years from the date of bid submission.</li> <li>6. Latest income and business tax returns; and</li> <li>7. Valid licenses issued by the Professional Regulatory Commission (PRC);</li> </ol> <p>No other acceptable proof of registration is recognized.</p>
21	<p>Additional contract documents relevant to the Project that may be required by existing laws and/or the Procuring Entity, such as construction schedule and S-curve, manpower schedule, construction methods, equipment utilization schedule, construction safety and health program approved by the DOLE, and other acceptable tools of project scheduling.</p>

## ***Section IV. General Conditions of Contract***

### **Notes on the General Conditions of Contract**

The General Conditions of Contract (GCC) in this Section, read in conjunction with the Special Conditions of Contract in Section V and other documents listed therein, should be a complete document expressing all the rights and obligations of the parties.

Matters governing performance of the Contractor, payments under the contract, or matters affecting the risks, rights, and obligations of the parties under the contract are included in the GCC and Special Conditions of Contract.

Any complementary information, which may be needed, shall be introduced only through the Special Conditions of Contract.

## 1. Scope of Contract

This Contract shall include all such items, although not specifically mentioned, that can be reasonably inferred as being required for its completion as if such items were expressly mentioned herein. All the provisions of RA No. 9184 and its 2016 revised IRR, including the Generic Procurement Manual, and associated issuances, constitute the primary source for the terms and conditions of the Contract, and thus, applicable in contract implementation. Herein clauses shall serve as the secondary source for the terms and conditions of the Contract.

This is without prejudice to Sections 74.1 and 74.2 of the 2016 revised IRR of RA No. 9184 allowing the GPPB to amend the IRR, which shall be applied to all procurement activities, the advertisement, posting, or invitation of which were issued after the effectivity of the said amendment.

## 2. Sectional Completion of Works

If sectional completion is specified in the **Special Conditions of Contract (SCC)**, references in the Conditions of Contract to the Works, the Completion Date, and the Intended Completion Date shall apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

## 3. Possession of Site

3.1 The Procuring Entity shall give possession of all or parts of the Site to the Contractor based on the schedule of delivery indicated in the **SCC**, which corresponds to the execution of the Works. If the Contractor suffers delay or incurs cost from failure on the part of the Procuring Entity to give possession in accordance with the terms of this clause, the Procuring Entity's Representative shall give the Contractor a Contract Time Extension and certify such sum as fair to cover the cost incurred, which sum shall be paid by Procuring Entity.

3.2 If possession of a portion is not given by the above date, the Procuring Entity will be deemed to have delayed the start of the relevant activities. The resulting adjustments in contract time to address such delay may be addressed through contract extension provided under Annex "E" of the 2016 revised IRR of RA No. 9184.

## 4. The Contractor's Obligations

The Contractor shall employ the key personnel named in the Schedule of Key Personnel indicating their designation, in accordance with **ITB** Clause 10.3 and specified in the **BDS**, to carry out the supervision of the Works.

The Procuring Entity will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are equal to or better than those of the personnel listed in the Schedule.

## **5. Performance Security**

- 5.1. Within ten (10) calendar days from receipt of the Notice of Award from the Procuring Entity but in no case later than the signing of the contract by both parties, the successful Bidder shall furnish the performance security in any of the forms prescribed in Section 39 of the 2016 revised IRR.
- 5.2. The Contractor, by entering into the Contract with the Procuring Entity, acknowledges the right of the Procuring Entity to institute action pursuant to RA No. 3688 against any subcontractor be they an individual, firm, partnership, corporation, or association supplying the Contractor with labor, materials and/or equipment for the performance of this Contract.

## **6. 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.

## **7. Warranty**

- 7.1. In case the Contractor fails to undertake the repair works under Section 62.2.2 of the 2016 revised IRR, 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.
- 7.2. The warranty against Structural Defects/Failures, except that occasioned-on force majeure, shall cover the period from the date of issuance of the Certificate of Final Acceptance by the Procuring Entity. Specific duration of the warranty is found in the SCC.

## **8. 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.

If the Contractor is a joint venture, all partners to the joint venture shall be jointly and severally liable to the Procuring Entity.

## **9. Termination for Other Causes**

Contract termination shall be initiated 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 corrupt, fraudulent, collusive, coercive, and obstructive practices as stated in **ITB** Clause 4.

## **10. Dayworks**

Subject to the guidelines on Variation Order in Annex “E” of the 2016 revised IRR of RA No. 9184, 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.

## **11. Program of Work**

11.1. The Contractor shall submit to the Procuring Entity’s Representative for approval the said Program of Work showing the general methods, arrangements, order, and timing for all the activities in the Works. The submissions of the Program of Work are indicated in the **SCC**.

11.2. 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.

## **12. Instructions, Inspections and Audits**

The Contractor shall permit the GOP or the Procuring Entity to inspect the Contractor’s accounts and records relating to the performance of the Contractor and to have them audited by auditors of the GOP or the Procuring Entity, as may be required.

## **13. Advance Payment**

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**, subject to the requirements in Annex “E” of the 2016 revised IRR of RA No. 9184.

## **14. Progress Payments**

The Contractor may submit a request for payment for Work accomplished. Such requests 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.

## **15. Operating and Maintenance Manuals**

- 15.1. If required, the Contractor will provide “as built” Drawings and/or operating and maintenance manuals as specified in the **SCC**.
- 15.2. If the Contractor does not provide the Drawings and/or manuals by the dates stated above, or they do not receive the Procuring Entity’s Representative’s approval, the Procuring Entity’s Representative may withhold the amount stated in the **SCC** from payments due to the Contractor.

## ***Section V. Special Conditions of Contract***

### **Notes on the Special Conditions of Contract**

Similar to the BDS, the clauses in this Section are intended to assist the Procuring Entity in providing contract-specific information in relation to corresponding clauses in the GCC found in Section IV.

The Special Conditions of Contract (SCC) complement the GCC, specifying contractual requirements linked to the special circumstances of the Procuring Entity, the Procuring Entity's country, the sector, and the Works procured. In preparing this Section, the following aspects should be checked:

- a. Information that complements provisions of the GCC must be incorporated.
- b. Amendments and/or supplements to provisions of the GCC as necessitated by the circumstances of the specific purchase, must also be incorporated.

However, no special condition which defeats or negates the general intent and purpose of the provisions of the GCC should be incorporated herein.

# Special Conditions of Contract

GCC Clause																																																																																											
2	<p><i>The intended Completion of Works for the project is <b><u>720 Calendar Days</u></b> with the following time frame:</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="text-align: center;">ACTIVITY</th> <th colspan="12" style="text-align: center;"><i>Bi-Monthly Schedule</i></th> </tr> <tr> <th style="text-align: center;">1</th> <th style="text-align: center;">2</th> <th style="text-align: center;">3</th> <th style="text-align: center;">4</th> <th style="text-align: center;">5</th> <th style="text-align: center;">6</th> <th style="text-align: center;">7</th> <th style="text-align: center;">8</th> <th style="text-align: center;">9</th> <th style="text-align: center;">10</th> <th style="text-align: center;">11</th> <th style="text-align: center;">12</th> </tr> </thead> <tbody> <tr> <td>Pre-Design including Owner's approval</td> <td style="text-align: center;">-15 C.D.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Detailed design including Owner's approval</td> <td style="text-align: center;">---30 C.D.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Application and Issuance of applicable permits</td> <td style="text-align: center;">---30 C.D.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Demolition Phase</td> <td style="text-align: center;">-----180 C.D.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Construction Phase</td> <td style="text-align: center;">540 C.D.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	ACTIVITY	<i>Bi-Monthly Schedule</i>												1	2	3	4	5	6	7	8	9	10	11	12	Pre-Design including Owner's approval	-15 C.D.												Detailed design including Owner's approval	---30 C.D.												Application and Issuance of applicable permits	---30 C.D.												Demolition Phase	-----180 C.D.												Construction Phase	540 C.D.											
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3.1	<i>The Procuring Entity shall give possession of all parts of the Site to the Contractor upon the issuance of Notice to Proceed.</i>																																																																																										
6	The site investigation reports includes boundaries of the property, elevation and contours (at 0.5m interval), soil tests, location, dimension, existing floor elevations and other pertinent data on existing buildings and improvements and existing utility lines.																																																																																										
7.2	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: <b>Fifteen (15) years.</b>																																																																																										
10	Dayworks are applicable at the rate shown in the Contractor's original Bid.																																																																																										
11.1	The Contractor shall submit the Program of Work to the Procuring Entity's Representative within fourteen (14) calendar days upon issuance of the Notice of Award																																																																																										
11.2	The amount to be withheld for late submission of an updated Program of Work is one percent (1%).																																																																																										
13	Advance payment shall be made only upon the submission to and acceptance by the Procuring Entity. The amount of the advance payment is fifteen percent (15%) of the Contract price.																																																																																										
14	Materials and equipment delivered on the site but not completely put in place shall be included for payment.																																																																																										
15.1	If required, the Contractor will provide "as built" Drawings and/or operating and maintenance manuals within thirty (30) calendar days from the completion of the project																																																																																										
15.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required is one																																																																																										

	percent (1%) of the final contract amount.
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## *Section VI. Specifications*

### **Notes on Specifications**

A set of precise and clear specifications is a prerequisite for Bidders to respond realistically and competitively to the requirements of the Procuring Entity without qualifying or conditioning their Bids. In the context of international competitive bidding, the specifications must be drafted to permit the widest possible competition and, at the same time, present a clear statement of the required standards of workmanship, materials, and performance of the goods and services to be procured. Only if this is done will the objectives of economy, efficiency, and fairness in procurement be realized, responsiveness of Bids be ensured, and the subsequent task of bid evaluation facilitated. The specifications should require that all goods and materials to be incorporated in the Works be new, unused, of the most recent or current models, and incorporate all recent improvements in design and materials unless provided otherwise in the Contract.

Samples of specifications from previous similar projects are useful in this respect. The use of metric units is mandatory. Most specifications are normally written specially by the Procuring Entity or its representative to suit the Works at hand. There is no standard set of Specifications for universal application in all sectors in all regions, but there are established principles and practices, which are reflected in these PBDs.

There are considerable advantages in standardizing General Specifications for repetitive Works in recognized public sectors, such as highways, ports, railways, urban housing, irrigation, and water supply, in the same country or region where similar conditions prevail. The General Specifications should cover all classes of workmanship, materials, and equipment commonly involved in construction, although not necessarily to be used in a particular Works Contract. Deletions or addenda should then adapt the General Specifications to the particular Works.

Care must be taken in drafting specifications to ensure that they are not restrictive. In the specification of standards for goods, materials, and workmanship, recognized international standards should be used as much as possible. Where other particular standards are used, whether national standards or other standards, the specifications should state that goods, materials, and workmanship that meet other authoritative standards, and which ensure substantially equal or higher quality than the standards mentioned, will also be acceptable. The following clause may be inserted in the SCC.

#### **Sample Clause: Equivalency of Standards and Codes**

Wherever reference is made in the Contract to specific standards and codes to be met by the goods and materials to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national, or relate to a particular country or region, other authoritative standards that ensure a substantially equal or higher quality than the standards and codes specified will be

accepted subject to the Procuring Entity's Representative's prior review and written consent. Differences between the standards specified and the proposed alternative standards shall be fully described in writing by the Contractor and submitted to the Procuring Entity's Representative at least twenty-eight (28) days prior to the date when the Contractor desires the Procuring Entity's Representative's consent. In the event the Procuring Entity's Representative determines that such proposed deviations do not ensure substantially equal or higher quality, the Contractor shall comply with the standards specified in the documents.

These notes are intended only as information for the Procuring Entity or the person drafting the Bidding Documents. They should not be included in the final Bidding Documents.

## **TERMS OF REFERENCE (TOR)**



## ***Section VII. Drawings***

*[Insert here a list of Drawings. The actual Drawings, including site plans, should be attached to this section, or annexed in a separate folder.]*

## *Section VIII. Bill of Quantities*

### **Notes on the Bill of Quantities**

#### **Objectives**

The objectives of the Bill of Quantities are:

- a. to provide sufficient information on the quantities of Works to be performed to enable Bids to be prepared efficiently and accurately; and
- b. when a Contract has been entered into, to provide a priced Bill of Quantities for use in the periodic valuation of Works executed.

In order to attain these objectives, Works should be itemized in the Bill of Quantities in sufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost. Consistent with these requirements, the layout and content of the Bill of Quantities should be as simple and brief as possible.

#### **Daywork Schedule**

A Daywork Schedule should be included only if the probability of unforeseen work, outside the items included in the Bill of Quantities, is high. To facilitate checking by the Entity of the realism of rates quoted by the Bidders, the Daywork Schedule should normally comprise the following:

- a. A list of the various classes of labor, materials, and Constructional Plant for which basic daywork rates or prices are to be inserted by the Bidder, together with a statement of the conditions under which the Contractor will be paid for work executed on a daywork basis.
- b. Nominal quantities for each item of Daywork, to be priced by each Bidder at Daywork rates as Bid. The rate to be entered by the Bidder against each basic Daywork item should include the Contractor's profit, overheads, supervision, and other charges.

#### **Provisional Sums**

A general provision for physical contingencies (quantity overruns) may be made by including a provisional sum in the Summary Bill of Quantities. Similarly, a contingency allowance for possible price increases should be provided as a provisional sum in the Summary Bill of Quantities. The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises. Where such provisional sums or contingency allowances are used, the SCC should state the manner in which they will be used, and under whose authority (usually the Procuring Entity's Representative's).

The estimated cost of specialized work to be carried out, or of special goods to be supplied, by other contractors should be indicated in the relevant part of the Bill of Quantities as a particular provisional sum with an appropriate brief description. A separate procurement procedure is normally carried out by the Procuring Entity to select such specialized contractors. To provide an element of competition among the Bidders in respect of any facilities, amenities, attendance, etc., to be provided by the successful Bidder as prime Contractor for the use and convenience of the specialist contractors, each related provisional sum should be followed by an item in the Bill of Quantities inviting the Bidder to quote a sum for such amenities, facilities, attendance, etc.

### **Signature Box**

A signature box shall be added at the bottom of each page of the Bill of Quantities where the authorized representative of the Bidder shall affix his signature. Failure of the authorized representative to sign each and every page of the Bill of Quantities shall be a cause for rejection of his bid.

These Notes for Preparing a Bill of Quantities are intended only as information for the Procuring Entity or the person drafting the Bidding Documents. They should not be included in the final documents.

<b>SUBJECT:</b>		<b>BILL OF QUANTITIES / COST ESTIMATE</b>			
<b>NAME OF PROJECT:</b>		<b>DESIGN AND BUILD SERVICES (DEMOLITION OF EXISTING STRUCTURES WITHIN PASIG CITY HALL COMPOUND AND CONSTRUCTION OF THE NEW PASIG CITY HALL,</b>			
<b>LOCATION:</b>		<b>CARUNCHO AVE., BRGY. SAN NICOLAS, PASIG CITY</b>			
<b>ITEM NO.</b>	<b>DESCRIPTION</b>	<b>QTY.</b>	<b>UNIT</b>	<b>UNIT PRICE (Php)</b>	<b>AMOUNT (Php)</b>
1	PRELIMINARY AND DETAILED ENGINEERING DESIGN	1.00	LS		
	(Pesos)				
2	DEMOLITION WORKS	1.00	LS		
	(Pesos)				
3	ARCHITECTURAL WORKS	1.00	LS		
	(Pesos)				
4	STRUCTURAL WORKS	1.00	LS		
	(Pesos)				
5	ELECTRICAL SYSTEM WORKS	1.00	LS		
	(Pesos)				
6	MECHANICAL WORKS	1.00	LS		
	(Pesos)				
7	PLUMBING AND SANITARY WORKS	1.00	LS		
	(Pesos)				
8	INTERIOR FIT-OUT	1.00	LS		
	(Pesos)				

9	INFORMATION TECHNOLOGY SYSTEM WORKS	1.00	LS		
	(Pesos)				
10	LANDSCAPE OPEN SPACE	1.00	LS		
	(Pesos)				
	<b>Total Amount in words:</b>				
	_____				
	_____				
	_____				
	<b>GRAND TOTAL</b>				

	(Signature)
(Name & Address of Bidder)	(Name, Designation of Authorized Signing Official)

## ***Section IX. Checklist of Technical and Financial Documents***

### **Notes on the Checklist of Technical and Financial Documents**

The prescribed documents in the checklist are mandatory to be submitted in the Bid, but shall be subject to the following:

- a. GPPB Resolution No. 09-2020 on the efficient procurement measures during a State of Calamity or other similar issuances that shall allow the use of alternate documents in lieu of the mandated requirements; or
- b. any subsequent GPPB issuances adjusting the documentary requirements after the effectivity of the adoption of the PBDs.

The BAC shall be checking the submitted documents of each Bidder against this checklist to ascertain if they are all present, using a non-discretionary “pass/fail” criterion pursuant to Section 30 of the 2016 revised IRR of RA No. 9184.

**Republic of the Philippines**  
**BIDS AND AWARDS COMMITTEE**  
**City Government of Pasig**

Name of Bidder : \_\_\_\_\_  
Name of Contract : \_\_\_\_\_  
Approved Budget Contract : \_\_\_\_\_  
Bidding Date : \_\_\_\_\_

(Note: Checklist is to be filled up by the BAC only)

**I. TECHNICAL COMPONENT ENVELOPE FOR THE PROCUREMENT OF INFRASTRUCTURE PROJECTS**

**- Class "A" Documents -**

Legal Documents

No.	TYPE OF DOCUMENT	PASS/FAIL	REMARKS/FINDINGS
1.	Valid PhilGEPS Certificate of Platinum Registration and Membership with additional caveat in accordance with Section 8.5.2 of the 2016 Revised IRR of RA 9184 amended through GPPB Resolution No. 15-2021, provided that all of Class "A" eligibility documents submitted to PhilGEPS are maintained and updated		

Technical Documents

No.	TYPE OF DOCUMENT	PASS/FAIL	REMARKS/FINDINGS
2.	A valid Philippine Contractors Accreditation Board (PCAB) License or Special PCAB License in case of Joint Ventures, and registration for the type and cost of the contract to be bid		
3.	Statement of the bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid.		
4.	Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules (Contractors under Small A and Small B categories without similar experience on the contract to be bid may be allowed to bid if the cost of such contract is not more than the Allowable Range of Contract Cost (ARCC) of their registration based on the guidelines as prescribed by the PCAB		
5.	Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission; <b>or</b> Original copy of Notarized Bid Securing Declaration		
6.	Project Requirements, which shall include the following:		
	6.1 Organizational chart for the contract to be bid		
	6.2 List of contractor's key personnel (e.g., Project Manager, Project Engineers, Materials Engineers, and Foremen), to be assigned to		

	the contract to be bid, with their complete qualification and experience data		
	6.3 List of contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be		
	6.4 Duly signed Manpower Schedule		
	6.5 Equipment utilization schedule		
	6.6 Duly signed Construction Schedule (PERT/CPM) and S-curve		
	6.7 Duly signed Construction Method in narrative form		
	6.8 Construction Safety and Health Program		
<b>In addition to the above, the Technical Component shall include the following requirements</b>			
7.	Preliminary Conceptual Design Plans in accordance with the degree of details specified by the procuring entity:		
	> Cover Sheet		
	> General Index		
	> Vicinity and Key Map		
	> Location plan/ Lay out		
	> Legend, Abbreviation and Symbols		
	> General Notes		
	> Perspective Views		
	> Building Design Plan including floor plans, sections, and elevations		
	> Site Development Plan		
	> Engineering Plans, Layout, and Schematic Diagram		
8.	Design and Construction Methods which shall conform with the MPSS		
9.	List of design and construction personnel, to be assigned to the contract to be bid, with their complete qualification and experience data		
10.	Value Engineering (VE) Analysis of design and construction methods which shall be undertaken in accordance with the DPWH Guidelines for VE given in Appendix 2.1 of the Main Guidelines of the DPM Volume II		
11.	relevant statements of all on-going, completed, awarded but not yet started design/design and build related contracts, curriculum vitae of key staff, partners or principal officers;		
12.	valid licenses issued by the Professional Regulatory Commission (PRC) for design professionals		

Financial Documents

No.	TYPE OF DOCUMENT	PASS/FAIL	REMARKS/FINDINGS
13.	The prospective bidder's computation of Net Financial Contracting Capacity (NFCC).		



**- Class "B" Documents -**

No.	TYPE OF DOCUMENT	PASS/FAIL	REMARKS/FINDINGS
14.	If applicable, duly signed joint venture agreement (JVA) in accordance with RA No. 4566 and its IRR in case the joint venture is already in existence; <b>or</b> duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.		

**NOTE:** Any missing document/s on the above mentioned checklist is a ground for outright disqualification/ rejection of the bid.

**REMARKS:**  PASSED  FAILED

**ACKNOWLEDGMENT:** (Please see above "note" Do not fill up/sign if documents are marked passed)  
This is to acknowledge receipt of the first and second envelopes which is being returned because of disqualification due to deficiencies and non-compliance with checklist therein.

\_\_\_\_\_  
Signature over printed name/Representative of Bidder

\_\_\_\_\_  
Date Received

**CHECKED AND VERIFIED BY:**

**ATTY. JOSEPHINE C. LATI-BAGAOISAN**

Chairperson

**ATTY. DIEGO LUIS S. SANTIAGO**

Vice Chairperson

**DR. EMMA MEJIA-SANCHEZ**

Member

**DR. STUART G. SANTOS**

Member

**DR. JEANNA V. PLES**

Member

**ARCH. LEA V. OLIVAR**

Member

**ENGR. JOHNNY L. CALATA**

Member

**ATTY. KATHLEEN MAE M. VILLAMIN**

Alternate Member

**MR. JOSE REY Q. ESPINA**

Alternate Member

**ATTY. BERNICE C. MENDOZA**

Alternate Member

**ATTY. RAUL G. CORALDE**

Alternate Member

**ATTY. JOHNSON L. VILLARUEL**

Alternate Member

Attested by:

**ATTY. BEA THERESE P. VILLANUEVA**  
Officer in Charge, Procurement Management Office

**Republic of the Philippines  
BIDS AND AWARDS COMMITTEE  
City Government of Pasig**

Name of Bidder : \_\_\_\_\_  
 Name of Contract : \_\_\_\_\_  
 Approved Budget Contract: \_\_\_\_\_  
 Bidding Date : \_\_\_\_\_

(Note: Checklist is to be filled up by the BAC only)

**II. FINANCIAL COMPONENT ENVELOPE FOR THE PROCUREMENT OF INFRASTRUCTURE PROJECTS**

No.	TYPE OF DOCUMENT	PASS/FAIL	REMARKS/FINDINGS
12.	Original of duly signed and accomplished Financial Bid Form		
<i>Other documentary requirements under RA No. 9184</i>			
13.	Original of duly signed Bid Prices in the Bill of Quantities		
14.	Duly accomplished Detailed Estimates Form, including a summary sheet indicating the unit prices of construction materials, labor rates, and equipment rentals used in coming up with the Bid		
15.	Cash Flow by Quarter		

**NOTE:**

Any missing document/s on the above-mentioned checklist is a ground for outright disqualification/ rejection of the bid.

**REMARKS:**  PASSED  FAILED

**ACKNOWLEDGMENT:** (Please see above "note" Do not fill up/sign if documents are marked passed)  
 This is to acknowledge receipt of the first and second envelopes which is being returned because of disqualification due to deficiencies and non-compliance with checklist therein.

\_\_\_\_\_  
 Signature over printed name/Representative of Bidder

\_\_\_\_\_  
 Date Received

**ATTY. JOSEPHINE C. LATI-BAGAOISAN**  
 Chairperson

**ATTY. DIEGO LUIS S. SANTIAGO**  
 Vice Chairperson

**DR. EMMA MEJIA-SANCHEZ**  
 Member

**DR. STUART G. SANTOS**  
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Alternate Member

**ATTY. JOHNSON L. VILLARUEL**  
Alternate Member

Attested by:

**ATTY. BEA THERESE P. VILLANUEVA**  
Officer in Charge, Procurement Management Office

# BID FORM

Date : \_\_\_\_\_

Project Identification No. : \_\_\_\_\_

To: **THE CHAIRMAN**  
**BIDS AND AWARDS COMMITTEE**  
**PASIG CITY**

Having examined the Philippine Bidding Documents (PBDs) including the Supplemental or Bid Bulletin Numbers \_\_\_\_\_ the receipt of which is hereby duly acknowledged, we, the undersigned, declare that:

a. We have no reservation to the PBDs, including the Supplemental or Bid Bulletins, for the Procurement Project: **DESIGN AND BUILD SERVICES (DEMOLITION OF EXISTING STRUCTURES WITHIN PASIG CITY HALL COMPOUND AND CONSTRUCTION OF THE NEW PASIG CITY HALL, CARUNCHO AVE., BRGY. SAN NICOLAS, PASIG CITY;**

b. We offer to execute the Works for this Contract in accordance with the PBDs;

c. The total price of our Bid in words and figures, excluding any discounts offered below is: \_\_\_\_\_  
\_\_\_\_\_  
(P \_\_\_\_\_ )

d. The discounts offered and the methodology for their application are: \_\_\_\_\_;

e. The total bid price includes the cost of all taxes, such as, but not limited to: [specify the applicable taxes, e.g. (i) value added tax (VAT), (ii) income tax, (iii) local taxes, and (iv) other fiscal levies and duties], which are itemized herein and reflected in the detailed estimates,

f. Our Bid shall be valid within the a period stated in the PBDs, and it shall remain binding upon us at any time before the expiration of that period;

g. If our Bid is accepted, we commit to obtain a Performance Security in the amount of \_\_\_\_\_

(P \_\_\_\_\_) percent of the Contract Price for the due performance of the Contract, or a Performance Securing Declaration in lieu of the allowable forms of Performance Security, subject to the terms and conditions of issued GPPB guidelines<sup>12</sup> for this purpose;

h. We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Documents;

i. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed; and

j. We understand that you are not bound to accept the Lowest Calculated Bid or any other Bid that you may receive.

k. We likewise certify/confirm that the undersigned, is the duly authorized representative of the bidder, and granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for **DESIGN AND BUILD SERVICES (DEMOLITION OF EXISTING STRUCTURES WITHIN PASIG CITY HALL COMPOUND AND CONSTRUCTION OF THE NEW PASIG CITY HALL, CARUNCHO AVE., BRGY. SAN NICOLAS, PASIG CITY)** of the **Bids and Awards Committee (B.A.C.) Pasig City**

l. We acknowledge that failure to sign each and every page of this Bid Form, including the Bill of Quantities, shall be a ground for the rejection of our bid.

Name: \_\_\_\_\_

Legal Capacity: \_\_\_\_\_

Signature: \_\_\_\_\_

Duly authorized to sign the Bid for and behalf of: \_\_\_\_\_

Date: \_\_\_\_\_

**Omnibus Sworn Statement (Revised)**  
*[shall be submitted with the Bid]*

---

REPUBLIC OF THE PHILIPPINES )  
CITY/MUNICIPALITY OF \_\_\_\_\_)S.S.

**AFFIDAVIT**

I, [Name of Affiant], of legal age, [Civil Status], [Nationality], and residing at [Address of Affiant], after having been duly sworn in accordance with law, do hereby depose and state that:

1. *[Select one, delete the other:]*

*[If a sole proprietorship:]*I am the sole proprietor or authorized representative of [Name of Bidder] with office address at [address of Bidder];

*[If a partnership, corporation, cooperative, or joint venture:]* I am the duly authorized and designated representative of [Name of Bidder] with office address at [address of Bidder];

2. *[Select one, delete the other:]*

*[If a sole proprietorship:]*As the owner and sole proprietor, or authorized representative of [Name of Bidder], I have full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached duly notarized Special Power of Attorney;

*[If a partnership, corporation, cooperative, or joint venture:]* I am granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached [state title of attached document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable)];

3. [Name of Bidder] is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government/foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board, **by itself or by relation, membership, association, affiliation, or controlling interest with another blacklisted person or entity as defined and provided for in the Uniform Guidelines on Blacklisting;**

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. [Name of Bidder] is authorizing the Head of the Procuring Entity or its duly authorized representative(s) to verify all the documents submitted;

6. *[Select one, delete the rest:]*

*[If a sole proprietorship:]* The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee(BAC), the Technical Working Group, and

the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

*[If a partnership or cooperative:]*None of the officers and members of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

*[If a corporation or joint venture:]* None of the officers, directors, and controlling stockholders of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee(BAC),the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. *[Name of Bidder]* complies with existing labor laws and standards; and
8. *[Name of Bidder]* is aware of and has undertaken the responsibilities as a Bidder in compliance with the Philippine Bidding Documents, which includes:
  - a. Carefully examining all of the Bidding Documents;
  - b. Acknowledging all conditions, local or otherwise, affecting the implementation of the Contract;
  - c. Making an estimate of the facilities available and needed for the contract to be bid, if any; and
  - d. Inquiring or securing Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*.
9. *[Name of Bidder]* did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.
10. **In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.**

IN WITNESS WHEREOF, I have hereunto set my hand this \_\_\_ day of \_\_\_, 20\_\_ at \_\_\_\_\_, Philippines.

*[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]*

*[Insert signatory's legal capacity]*  
Affiant

**[Jurat]**

*[Format shall be based on the latest Rules on Notarial Practice]*



## **Bid Securing Declaration Form**

*[shall be submitted with the Bid if bidder opts to provide this form of bid security]*

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REPUBLIC OF THE PHILIPPINES)  
CITY OF \_\_\_\_\_) S.S.

### **BID SECURING DECLARATION** **Project Identification No.:*[Insert number]***

To:*[Insert name and address of the Procuring Entity]*

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid Securing Declaration.
2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by the procuring entity for the commission of acts resulting to the enforcement of the bid securing declaration under Sections 23.1(b), 34.2, 40.1 and 69.1, except 69.1 (f), of the IRR of RA No.9184; without prejudice to other legal action the government may undertake.
3. I/We understand that this Bid Securing Declaration shall cease to be valid on the following circumstances:
  - a. Upon expiration of the bid validity period, or any extension there of pursuant to your request;
  - b. I am/we are declared ineligible or post-disqualified upon receipt of your notice to such effect, and (i) I/we failed to timely file a request for reconsideration or (ii) I/we filed a waiver to avail of said right; and
  - c. I am/we are declared the bidder with the Lowest Calculated Responsive Bid, and I/we have furnished the performance security and signed the Contract.

IN WITNESS WHEREOF, I/We have here unto set my/our hand/s this \_\_\_\_\_ day of *[month]* *[year]* at *[place of execution]*.

*[Insert NAME OF BIDDER OR ITS AUTHORIZED  
REPRESENTATIVE]*

*[Insert signatory's legal capacity]*  
Affiant

**[Jurat]**

*[Format shall be based on the latest Rules on Notarial Practice]*

**Statement of All Ongoing Government and Private Contracts Including Contracts Awarded But Not Yet Started, If Any, Whether Similar or Not in Nature and Complexity to the Contract to be Bid**

Business Name: \_\_\_\_\_

Business Address: \_\_\_\_\_

Name of the Contract and Project Location	a. Owner's Name b. Address c. Telephone Nos.	Nature of Work	Amount of Contract and Value of Outstanding Contract	a. Date of Contract b. Duration of the Contract c. Estimated Date of Completion	Bidder's Role		% of Accomplishment (based on latest % accomplishment report with a cut-off date of not earlier than October 2023)	
					Description	%	Planned	Actual
<b>Ongoing</b>								
<b>Contracts Awarded But Not Yet Started</b>								

Note: Bidder shall attach any of the following latest accomplishment report showing the percentages of planned and actual accomplishments:

- a. Statement of Work Accomplished showing the percentages of planned and actual accomplishments, or
- b. Updated Schedule Bar Chart with S-Curve, or
- c. Any similar report showing the percentages of planned and actual accomplishments of the project.

Said reports must be duly signed by the project owner or its representative. The absence of such document is a ground for disqualification of the Bidder.

Submitted by : \_\_\_\_\_  
(Printed Name & Signature)

Designation : \_\_\_\_\_

Date : \_\_\_\_\_

## Statement of Single Largest Completed Contract (SLCC)

**(Similar to the contract to be bid, within the last five (5) years from the date of submission and receipt of bids, the value of which must be at least fifty percent (50%) of the ABC)**

Business Name: \_\_\_\_\_

Business Address: \_\_\_\_\_

Name of the Contract	a. Owner's Name b. Address c. Telephone Nos.	Nature of Work	Amount of Contract	a. Date of Contract b. Duration of the Contract c. Date Completed	Bidder's Role		Total Contract Value at Completion
					Description	%	

Note: Attach a copy of the: 1) Notice of Award, Notice to Proceed, and/or official receipt(s); and 2) Certificate of Final Acceptance/Certificate of Satisfactory Completion. All the SLCC required documents should be issued by the client for the specified SLCC.

Submitted by : \_\_\_\_\_

(Printed Name & Signature)

Designation : \_\_\_\_\_

Date: : \_\_\_\_\_

## NFCC COMPUTATION FOR ELIGIBILITY CHECK

A. Summary of the Applicant Supplier's/Distributor's/Manufacturer's assets and liabilities on the basis of the attached income tax return and audited financial statement, stamped "RECEIVED" by the Bureau of Internal Revenue or BIR authorized collecting agent, for the immediately preceding year and a certified copy of Schedule of Fixed Assets particularly the list of construction equipment.

	Year 20_____
1.Total Assets	
2.Current Assets	
3.Total Liabilities	
4.Current Liabilities	
5.Net Worth(1-3)	
6.Net Working Capital (2-4)	

B. The Net Financial Contracting Capacity (NFCC) based on the above data is computed as follows:

**NFCC=[(Current assets minus current liabilities) (15)] minus the value of all outstanding or uncompleted portions of the projects under ongoing contracts, including awarded contracts yet to be started, coinciding with the contract to be bid.**

The values of the domestic bidder's current assets and current liabilities shall be based on the latest Audited Financial Statements (AFS) submitted to the BIR.

NFCC=P\_\_\_\_\_

Submitted by:

\_\_\_\_\_

Name of Supplier/ Distributor/ Manufacturer:

\_\_\_\_\_

Signature of Authorized Representative:

\_\_\_\_\_

Date:

# MARKING AND SEALING OF BIDS







## TERMS OF REFERENCE

**DESIGN AND BUILD SERVICES  
(DEMOLITION OF EXISTING STRUCTURES WITHIN  
PASIG CITY HALL COMPOUND AND CONSTRUCTION OF  
THE NEW PASIG CITY HALL, CARUNCHO AVE., BRGY.  
SAN NICOLAS, PASIG CITY)**

**TERMS OF REFERENCE**  
**DESIGN AND BUILD SERVICES**  
***(DEMOLITION OF EXISTING STRUCTURES WITHIN***  
***PASIG CITY HALL COMPOUND AND CONSTRUCTION OF***  
***THE NEW PASIG CITY HALL, CARUNCHO AVE., BRGY.***  
***SAN NICOLAS, PASIG CITY)***

**A. GENERAL INFORMATION**

This Terms of Reference (TOR) provides interested Bidders/ Contractors the guidelines and standards for the procurement under the design and build arrangement of the Seven (7) Storey with Roof Deck Pasig City Hall building to address the necessity of providing the citizens of Pasig a more conducive, safe, serviceable structure and to construct a building which emphasizes the need for Pasig City to harness technology as a tool for progress. This design and build project is in accordance with the provisions of the *Implementing Rules and Regulations R.A 9184*, as amended and its Annex “G” - Guidelines for the Procurement and Implementation of Contracts for Design and Build Infrastructure Projects, as modified.

Pasig City Hall Tech Infrastructure upgrade is aimed at enhancing the technological capabilities of PCH’s departments and agencies to better serve its constituents by improving the delivery of the LGU’s government services to its constituents through more efficient and accessible digital platforms leveraging on the following:

- A. High-speed and Resilient End-User Computing, Networking and Storage Infrastructure and Solution - to ensure connectivity, redundancy, and service uptime,
- B. Security & Compliance: Advanced security measures, including encryption, intrusion detection systems, and regular security audits, ensure compliance with legal and regulatory requirements.
- C. Improved Data Management: Ensure that data is stored, processed, and managed in a secure, efficient, and accessible manner.
- D. Scalability and Flexibility: Build an infrastructure that can scale with the growing demands and changing government needs.
- E. Sustainability and improved Operational efficiency - Implement energy-efficient technologies to minimize the environmental impact.

The main goal of this project is to adhere with the Vision of Pasig where the leaders of Pasig City envisioned a future where innovations and technology would redefine governance. Recognizing the global shift towards smart and connected cities, this project aims to propel Pasig City to become highly digitalized and equipping it to become a Smart City Institution.

**B. THE PROGRAM**



This project placed a strong emphasis on adopting the latest technological advancements. Pasig City sought partners who could bring forth cutting-edge solutions, ensuring that the city remains at the forefront of technological innovation. The vision was not merely to catch up with the present but to anticipate and embrace the future of smart governance.

This project also highlighted the need for eco-friendly and resource - efficient solutions as one of the key aspects to achieve Pasig City's commitment for sustainability. From energy management to infrastructure development, the focus was on incorporating sustainable practices into a fabric of the city's governance, ensuring a resilient and environmentally conscious future. It further aims to foster deep connections with the residents through enhanced civic engagement. This project calls for technology solutions that facilitate transparent communication, encourage citizen participation in decision - making and establish a more collaborative relationship between the government and the community. The goal was to create a City Hall that effectively and actively involves its citizens in shaping the future of the city.

### **C. FRAMEWORK**

The Design and Build Contract is hereby adopted for the design and construction of Seven (7) with Roof Deck Storey Pasig City Hall building in order to fast track the implementation of the above-mentioned project.

By incorporating the planning and design aspect in the proposed Seven (7) Storey with Roof Deck Pasig City Hall building the winning Bidder/Contractor will be bringing in an experienced team of Architects, Designers and Engineers in the field who has completed similar multi-storey buildings, has experience in complying with the standards of multi-storey building projects, and will be using expectedly, the latest appropriate technical standards for this facility.

### **D. OBJECTIVES**

1. To replace the aging and dilapidated structure and the outdated IT system posing security, reliable, and efficiency risks.
2. To cater to the increase in demand for digital services delivered to Pasig Constituents as infrastructure must scale to meet these needs.
3. To develop Pasig City Hall roadmap to Digital Transformation - a global shift towards digital services, requiring LGUs to provide online platforms for constituent engagement and service delivery.
4. To maximize data security and compliance. Pasig City Hall must ensure that their IT infrastructure is secure against cyber threats and compliant with data protection regulations.
5. To adopt Interoperability. Different Pasig City Hall departments often need to share data, requiring systems that can communicate seamlessly with one another.

### **E. THE SCOPE OF WORKS AND APPROVED BUDGET COST**

The proposed project calls for the Construction of Seven (7) Storey with Roof Deck Pasig City Hall with an approved budget cost of **Php 9,644,918,000.00** where work components include the general requirements:

## **I. DESIGN PHASE**

1. Verification Survey and Mapping
2. Geotechnical Investigation Report (Soil Investigation)
3. City Hall Development Plan
4. Schematic Drawings
5. Complete set of Design Plans
  - 5.1. Complete Set of Architectural Design Documents
    - 5.1.1. Perspective
    - 5.1.2. Vicinity/ Location Plan
    - 5.1.3. Elevation (at least 4 sides)
    - 5.1.4. Floor plans
    - 5.1.5. Sections (at least 2 section plane)
    - 5.1.6. Schedule of Doors and Windows
    - 5.1.7. Reflected Ceiling Plan
    - 5.1.8. Site Development Plan
    - 5.1.9. Details in Forms of Plan, Elevation, Section
      - Accessible Ramp
      - Accessible Stair
      - Accessible Lifts/Elevator
      - Accessible Entrances, Corridors and Walkways
      - Accessible Comfort rooms
      - Reserved Parking for Persons with Disability (PWD)
    - 5.1.10. Materials Specifications
6. Complete Set of Structural Documents
  - 6.1. Structural Plans
  - 6.2. Structural Specification
  - 6.3. Structural Design and Analysis with Seismic Load Analysis
  - 6.4. Geotechnical Investigation Report (Soil Test)
7. Complete Electrical Documents
  - 7.1. Electrical Plans
  - 7.2. General Notes and Specification
  - 7.3. Schedule of Loads and Transformer
  - 7.4. Electrical Design and Analysis
  - 7.5. Short Circuit Computation
8. Complete Set of Sanitary/Plumbing Documents
  - 8.1. Plans

- 8.2. Plumbing/Sanitary Specifications
- 8.3. Design Analysis
- 8.4. Isometric Drawing of the Whole System
  
- 9. Complete set of Mechanical Documents
  - 9.1. Plans
  - 9.2. Mechanical Specifications
  - 9.3. Isometric Drawing
  - 9.4. Detail drawing of all duct work installation indicating dampers, controls, filters, fire proofing, acoustical and thermal insulation
  - 9.5. Detail plan of machinery foundation and support
  - 9.6. Design computations and detailed plan of elevator, escalator and the like
  - 9.7. Detailed plan of Fire Suppression System, location of automatic and smoke detections and alarm
  - 9.8. Hydraulic Analysis for pumps
  
- 10. Complete Set of Electronics Documents
  - 10.1. Electronics Plans
  - 10.2. Electronic Specification
  - 10.3. Design Analysis (Battery Sizing Computation and Voltage Drop Computation)
  - 10.4. Riser Diagram and Single-Line Diagram
  
- 11. Interior Fit-out
- 12. Landscape

## **II. CONSTRUCTION PHASE**

- 1. Demolition works
  - 1.1. Dismantling/ Demolition of Building
  - 1.2. Clearing of Ground Zero
  - 1.3. Hauling of Debris
  - 1.4. Hauling of Salvaged Materials to a designated area
  
- 2. Architectural Works
  - 2.1. Tinsmithry Works
  - 2.2. Painting works
  - 2.3. Ceiling
  - 2.4. Floor Finishes
  - 2.5. Doors
  - 2.6. Windows
  - 2.7. Façade Cladding/Designs
  - 2.8. Signages
  - 2.9. Curtain walls

- 2.10. Waterproofing
  
- 3. Structural Works
  - 3.1. Excavation
  - 3.2. Shoring Protection
  - 3.3. Dewatering
  - 3.4. Backfilling
  - 3.5. Hauling of Unsuitable soils
  - 3.6. Earth filling and Compaction
  - 3.7. Piling Works
  - 3.8. Foundation Works
  - 3.9. Structural Steel Columns
  - 3.10. Structural Steel Beams
  - 3.11. RC Beams
  - 3.12. RC Columns
  - 3.13. Shear Walls
  - 3.14. Slab
  - 3.15. Steel Decking
  - 3.16. Falseworks
  - 3.17. Formworks
  - 3.18. Trusses and Roof Framing
  
- 4. Electrical System Works
  - 4.1. Lighting Fixtures
  - 4.2. Power Outlets
  - 4.3. Other Electrical Fixtures and Devices
  - 4.4. Electrical Roughing ins
  - 4.5. Main Distribution Panel
  - 4.6. Electrical Wiring and Connections of Electrical Systems
  - 4.7. Service Entrance
  
- 5. Mechanical Works
  - 5.1. Fire Suppression System
  - 5.2. Air-conditioning System
  - 5.3. Elevator System
  - 5.4. Escalator System
  - 5.5. Generator system
  - 5.6. HVAC System
  - 5.7. Gas Piping System
  
- 6. Plumbing and Sanitary Works
  - 6.1. Sewer Lines
  - 6.2. Water Lines

- 6.3. Fixtures
  - 6.4. Features
  - 6.5. Cistern tank
  - 6.6. Elevated water tank
  - 6.7. Sewage Treatment Plant
  - 6.8. Storm Drainage System
  - 6.9. Rainwater Harvesting Facility
  - 6.10. Oil and Grease Interceptor systems
- 7. Interior Fit-out
    - 7.1. Wall Partitions and Finishes
    - 7.2. Office System Partition
    - 7.3. Built-in Furniture
    - 7.4. Sound Proofing
- 8. Information Technology System Works
    - 8.1. Server Rooms
    - 8.2. IT Cabling
    - 8.3. Communication Devices
    - 8.4. Data and Telephone System (DTS)
    - 8.5. Public Address System (PAS)
    - 8.6. Closed-Circuit Television (CCTV) System
    - 8.7. Biometric Access Control
    - 8.8. Building Management System
- 9. Landscape/ Open Space
    - 9.1. Landscaping
    - 9.2. Fountain
    - 9.3. Drainage System
    - 9.4. Pavements
    - 9.5. Benches
    - 9.6. Site Development

The structure will accommodate approximately 4,000-4,500 seated employees and an average daily foot traffic of 15,000. The architectural form should maximize natural light and ventilation throughout the building. Spatial planning should achieve high building efficiency and accommodate easy ingress and egress especially during emergency situations.

## **F. PROJECTS COMPONENTS**

Site and space planning to be governed by the standards, rules and regulations on the design of Seven (7) Storey with Roof Deck Pasig City Hall building as prescribed by the Department and other concerned agencies. Building design shall conform to the provisions of the National

Building Code of the Philippines (PD 1096), Accessibility Law (BP 344), National Structural Code of the Philippines, Electrical Engineering Law RA (7920), Fire Code RA (9514) and other laws and regulations covering environmental concerns and local ordinances and regulations. The Land Area for Site Development Plan, Land and Floor Area for the City Hall Building, and Open spaces shall follow the City's requirement (*please refer to the Attached Annex "A"*).

## **I. Pre-Detailed Design**

### **1. Engineering Surveys and Investigations**

Surveys and investigations of the site includes boundaries of the property, elevations and contours (at 0.5m interval), soil tests, location, dimension, existing floor elevations and other pertinent data on existing buildings and improvements and existing utility lines.

### **2. Design Development Drawings**

Preparation of the following schematic drawings and documents for design development based on the space program prepared by the Pasig City Engineering Department:

- 2.1. Perspective Views
- 2.2. Floor plans, sections and elevations
- 2.3. Site Development Plan
- 2.4. Engineering Plans, Layout and Schematic Diagram

## **II. Detailed Design**

Preparation of the following Detailed Design Drawings based on the approved Design Development Drawings and Design Parameters including any revisions and refinements as approved and required by the procuring entity:

1. Detailed Architectural Plans (refer to Checklist of Drawings Requirements and Design Parameters).
2. Detailed Structural Plans (refer to Checklist of Drawings Requirements and Design Parameters).
3. Detailed Electrical Plans (refer to Checklist of Drawings Requirements and Design Parameters).
4. Structural Computations and Seismic Analysis and Electrical Design Computations.

5. General Notes and Technical Specifications describing type and quality of materials and equipment to be used, manner of construction and the general conditions under which the project is to be constructed.
6. Detailed Bill of Quantities, Cost Estimates including a summary sheet indicating the unit prices of construction materials, labor rates and equipment rentals.
7. Summary of Works

### **III. Construction**

As a rule, contract implementation guidelines for procurement of infrastructure projects shall comply with Annex "E" and guidelines for the implementation of contracts for DESIGN AND BUILD infrastructure projects shall comply with Annex "G" of IRR, RA 9184. The following provisions shall supplement these procedures:

1. The contractor shall commence works upon issuance of Building Permit for the project by the Building Official. Work execution shall be in accordance with reviewed and approved documents.
2. The contractor shall be responsible for obtaining all necessary information as to risks, contingencies and other circumstances which may affect the works and shall prepare and submit all necessary documents specified by the concerned Building Officials to meet all regulatory approvals as specified in the contract documents
3. The contractor shall submit a detailed program of works within fourteen (14) calendar days after the issuance of the Notice to Commence for approval by the procuring entity that shall include, among others:
  - a. The order in which it intends to carry out the work including anticipated timing for each stage of design/detailed engineering and construction;
  - b. Periods for review of specific outputs and any other submissions and approvals;
  - c. Sequence of timing for inspection and tests;
  - d. General description of the design and construction methods to be adopted;
  - e. Number and names of personnel to be assigned for each stage of the work;
  - f. List of equipment required on site for each stage of the work; and
  - g. Description of the quality control system to be utilized for the project.

4. Any errors, omissions, inconsistencies, inadequacies or failures submitted by the contractor that do not comply with the requirements shall be rectified, resubmitted and reviewed at the contractor's cost. If the contractor wishes to modify and design or document which has been previously submitted, reviewed and approved, the contractor shall notify the procurement within a reasonable period of time and shall shoulder the cost of such changes.
5. As a rule, changes in design and construction requirements shall be limited only to those that have not been anticipated in the contract documents prior to contract signing and approval. The following guidelines shall govern approval for change or variation orders:
  - a. Change Orders resulting from design errors, omissions or non-conformance with the performance specifications and parameters and the contract documents by the contractor shall be implemented by the contractor at no additional cost to the Owner.
  - b. Provided that the contractor suffers delay and/or incurs costs due to changes or errors in the Owners performance specifications and parameters, the contractor shall be entitled to either one of the following:
    - An extension of time for any such delays under Section 10 of Annex "E" of RIR (RA 9184); or
    - Payment for such costs as specified in the contract documents, provided that the cumulative amount of the variation order does not exceed ten percent (10%) of the original project cost.
    - The contract documents shall include the manner and schedule of payment specifying the estimated contract amount and installment in which the contract will be paid.
    - The procuring entity shall define the quality control procedures for the design and construction in accordance with the DPWH guidelines and shall issue the proper certificates of acceptance for sections of the works or whole of the works as provided for in the contract documents.
    - The contractor shall provide all necessary equipment, personnel, instruments, documents and others to carry out specified tests.
    - This design and build project shall have a minimum Defects Liability Period of one (1) year after contract completion or as provided for in the contract documents.



This is without prejudice to the liabilities imposed upon the engineer/architect who drew up the plans and specification for building sanctioned under Section 1723 of the New Civil Code of the Philippines.

- The contractor shall be held liable for design and structural defects and/or failure of the completed project within the warranty period of 15 years for permanent structures/buildings as specified in Section 62.2.3.2 of the IRR (RA 9184).

## **G. MINIMUM PERFORMANCE SPECIFICATIONS AND PARAMETERS**

### **I. General Planning Guidelines**

Proposals shall meet the minimum performance specifications herein set forth.

1. The building designs shall conform to the provisions of the National Building Code of the Philippines (PD 1096), Philippine Green Building Code, Accessibility Law (BP 344), the Fire Code of the Philippines, the National Structural Code of the Philippines, Electrical Engineering Code of the Philippines, and the local ordinances of the city.
2. Adoption of the green infrastructure and preservation of existing natural assets of the land such as trees, ground cover and vegetation, and natural waterways.
3. The Builder shall submit Traffic Impact Report with recommendations on:
  - Public Transport Facilities;
  - Pedestrian Facilities/Features; and
  - Internal Circulations and Parking.
4. The Bidder shall prepare the structural design in accordance with the latest National Structural Code of the Philippines.
5. Given the scale, material requirements and time frame of the project, the Bidder is required to present a MOA from construction suppliers (Portland cement, structural steel, coarse and fine aggregates, etc.) to ensure a stable and efficient supply of materials.

### **II. Water and Power Supply**

#### **1. Water Supply Lines**

Supply of water shall be sourced from the existing water line.

Proper coordination and institutional arrangement with the MWSS and the appropriate concessionaire in the project site (MWCI/MWC) shall be undertaken by the Winning Bidder/Contractor.

## **2. Power Supply / MERALCO**

The procuring entity through the concerned Project Office shall provide all pertinent documents necessary for MERALCO/other service providers to enable the Winning Bidder/Contractor to prepare the Master Plan for the power supply distribution system to include the primary line and distribution facilities and transformers. The bidder shall include in the project costs all pertinent costs relative to the installation and energization of the power system of the project as follows:

Supply and installation of the needed secondary connection poles including load side wires, messenger wires and other pole accessories.

Fees and expenses related to the provision of electrical facilities as required by the Local Government of Pasig City shall likewise be included in the Project Cost by the Winning Bidder/Contractor as well as wiring permit fees (CEIs), wiring permit application signed and sealed by an Electrical Engineer, and the occupancy permits for each of the housing units.

## **3. Building Design and Standard**

The structure will accommodate approximately 4,000-4,500 seated employees and an average daily foot traffic of 15,000. The architectural form should maximize natural light and ventilation throughout the building. Spatial planning should achieve high building efficiency and accommodate easy ingress and egress especially during emergency situations.

### **III. SPECIFICATIONS**

1. Design Parameters: In accordance with the National Building Code and National Structural Code of the Philippines Fire code, BP344, and Plumbing Code of the Philippines
2. Reinforced Concrete Structure - in accordance with the National Building Codes and Structural Code of the Philippines
  - a) No of Structure - One (1)
  - b) No of floor - 7 storey with roof deck
  - c) Total covered Floor Area - Approximately 46,000 square meters to accommodate 4,500 seated employees and 15,000 daily foot traffic.

- d) Protective Seismic System - must provide base isolation which may involve putting flexible bearings or pads made from layers of rubber and lead between the building's foundations and the structure above. These base isolators move and stretch under pressure and absorb much of an earthquake's impact by reducing swaying and shaking during an earthquake.
- e) Green building or Sustainable Design Solution - in both the structure and the application of processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from planning to design, construction, operation, maintenance, renovation, and demolition. This requires close cooperation of the contractor, the architects, the engineers, and the client at all project stages.
- f) Parking Area – minimum of 650 parking spaces:
  - 500 parking spaces for 4 Wheel Vehicle (*intended for VIP, Employees, Public, and Motor Pool*)
  - 100 Motorcycle
  - 25 parking spaces for Bicycle
  - 25 parking spaces for PWD

### 3. Finishes

- a) Exterior - Clear and reflective low-e glass curtain wall system, Plastered CHB exterior wall or pre-cast concrete wall with textured finish, Satin painted finish, or its equivalent.
- b) Flooring - Homogeneous Porcelain floor tiles for office and public areas, pigmented concrete pavers for outdoor open spaces, polished concrete for utility and service areas
- c) Partition - Plastered CHB or pre-cast concrete interior wall painted or clad finish, frameless glass partitions, or its equivalent.
- d) Interior Partition & Ceiling - Exposed ceiling in painted finish for general office spaces, acoustic board in metal frame for spaces requiring acoustical treatment, gypsum board in metal frame with curtain cove and cove light provisions for major offices, or its equivalent.
- e) Doors - doors to match the interiors, frameless glass pivot doors for enclosed offices, steel door in painted finish for utilities and service areas, or its equivalent.
- f) Windows - Reflective and clear glass curtain wall system with operable panels for natural ventilation, or its equivalent.
- g) Fit-Out - provide office partitions and furniture.

4. Building Equipment - Elevator (VIP, Private, Public, & Services), Escalators, Generator set, Transformer, Meter Center, Garbage Chute and Garbage Collecting Room (minimum requirement of Mechanical Building Code of the Philippines).

5. Telecommunication Room - to accommodate two (2) room provisions

6. Sanitary / Plumbing - Provide PWD and Gender-neutral toilets

7. Lightning Protection
8. Fire Protection System
9. Mechanical Works - Air-conditioned offices maintained at least 20 degrees celsius
10. Sewage Treatment Plant
11. Landscape & Hardscapes
12. Furnishings / Office / Storage / Pantry

## **H. GENERAL REQUIREMENTS**

### **1. Scope of Contract**

This Contract shall include all such items, although not specifically mentioned, that can be reasonably inferred as being required for its completion as such items were expressly mentioned herein. All the provisions of RA No. 9184 and its 2016 revised IRR, including the Generic Procurement Manual, and associated issuances, constitute the primary source for the terms and conditions of the Contract, and thus, applicable in contract implementation. Herein clauses shall serve as the secondary source for the terms and conditions of the Contract.

This is without prejudice to Sections 74.1 and 74.2 of the 2016 revised IRR of RA No. 9184 allowing the GPPB to amend the IRR, which shall be applied to all procurement activities, the advertisement, posting, or invitation of which were issued after the effectivity of the said amendment.

### **2. Sectional Completion of Works**

If sectional completion is specified in the **Special Condition of Contract (SSC)**, references in the Conditions of Contract to the Works, the Completion Date, and the Intended Completion Date shall apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

### **3. Possession of Site**

3.1. The Procuring Entity shall give possession of all or parts of the Site to the Contractor based on the schedule of delivery indicated in the SCC, which corresponds to the execution of the Works. If the Contractor suffers delay or incurs cost from failure on the part of the Procuring Entity to give possession in accordance with the terms of this clause, the Procuring Entity's Representative shall give the Contractor a Contract Time Extension and certify such sum as fair to cover the cost incurred, which sum shall be paid by the Procuring Entity.

3.2. If possession of a portion is not given by the above date, the Procuring Entity will be deemed to have delayed the start of the relevant activities. The resulting adjustments in contract time to address such delay may be addressed through contract extension provided under Annex "E" of the 2016 revised IRR of RA No. 9184.

#### **4. The Contractor's Obligations**

The Contractor shall employ the key personnel named in the Schedule of Key Personnel indicating their designation, in accordance with ITB Clause 10.3 and specified in the BDS, to carry out the supervision of the Works.

The Procuring Entity will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are equal to or better than those of the personnel listed in the Schedule.

#### **5. Performance Security**

5.1. Within ten (10) calendar days from receipt of the Notice of Award from the Procuring Entity but in no case later than the signing of the contract by the both parties, the successful Bidder shall furnish the performance security in any of the forms prescribed in Section 39 of the 2016 revised IRR.

5.2. The Contractor, by entering into the Contract with the Procuring Entity, acknowledges the right of the Procuring Entity to institute action pursuant to RA No. 3688 against any subcontractor be they an individual, firm, partnership, corporation, or association supplying the Contractor with labor, materials and/or equipment for the performance of this Contract.

#### **6. 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

#### **7. Warranty**

7.1. In case the Contractor fails to undertake the repair works Section 62.2.2 of the 2016 revised IRR, 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.

7.2. The warranty against Structural Defects/Failures, except that occasioned-on force majeure, shall cover the period from the date of issuance of the Certificate of Final Acceptance by the Procuring Entity. Specific duration of the warranty is found in the SCC.

## **8. 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.

If the Contractor is a joint venture, all partners to the joint venture shall be jointly and severally liable to the Procuring Entity

## **9. Termination for Other Causes**

Contract termination shall be initiated 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 corrupt, fraudulent, collusive, coercive, and obstructive practices as stated in **ITB** Clause 4.

## **10. Dayworks**

Subject to the guidelines on Variation Order in Annex "E" of the 2016 revised IRR of RA No. 9184, 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.

## **11. Program of Work**

11.1. The Contractor shall submit to the Procuring Entity's Representative for approval the said Program of Work showing the general methods, arrangements,

order, and timing for all the activities in the Works. The submissions of the Program if Work are indicated in the SCC.

11.2. 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.

## **12. Instructions, Inspections and Audits**

The Contractor shall permit the GOP or the Procuring Entity to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors of the GOP or the Procuring Entity, as may be required.

## **13. Advance Payment**

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, subject to the requirements in Annex "E" of the 2016 revised IRR of RA No. 9184.

## **14. Progress Payments**

The Contractor may submit a request for payment for Work accomplished. Such requests 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.

## **15. Operating and Maintenance Manuals**

15.1. If required, the Contractor will provide "as built" Drawing and/or operating and maintenance manuals as specified in the SCC.

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

## I. APPROVED BUDGET COST

The approved budget cost of the project is PhP 9,644,918,000.00, which is aggregated as follows:

Item No.	Description	Amount (Php)
1	Preliminary and Detailed Engineering Design <ul style="list-style-type: none"> <li>- Mobilization and Demobilization</li> <li>- Site Barracks</li> <li>- 1. Verification Survey and Mapping</li> <li>- 2. Geotechnical Investigation Report (Soil Investigation)</li> <li>- 3. City Hall Development Plan</li> <li>- 4. Schematic Drawings</li> <li>- 5. Complete set of Design Plans</li> <li>- 1. Complete Set of Architectural Design Documents               <ul style="list-style-type: none"> <li>1. Perspective</li> <li>2. Vicinity/ Location Plan</li> <li>3. Elevation (at least 4 sides)</li> <li>4. Floor plans</li> <li>5. Sections (at least 2 section plane)</li> <li>6. Schedule of Doors and Windows</li> <li>7. Reflected Ceiling Plan</li> <li>8. Site Development Plan</li> <li>9. Details in Forms of Plan, Elevation, Section</li> <li>· Accessible Ramp</li> <li>· Accessible Stair</li> <li>· Accessible Lifts/Elevator</li> <li>· Accessible Entrances, Corridors and Walkways</li> <li>· Accessible Comfort rooms</li> <li>· Reserved Parking for Persons with Disability (PWD)</li> </ul> </li> <li>10. Materials Specifications</li> </ul>	
	<ul style="list-style-type: none"> <li>- 6. Complete Set of Structural Documents</li> <li>- 1. Structural Plans</li> </ul>	



	<ul style="list-style-type: none"> <li>- 2. Structural Specification</li> <li>- 3. Structural Design and Analysis with Seismic Load Analysis</li> <li>- 4. Geotechnical Investigation Report (Soil Test)</li> <li>-</li> <li>- 7. Complete Electrical Documents <ul style="list-style-type: none"> <li>- 1. Electrical Plans</li> <li>- 2. General Notes and Specification</li> <li>- 3. Schedule of Loads and Transformer</li> <li>- 4. Electrical Design and Analysis</li> <li>- 5. <u>Short Circuit Computation</u></li> </ul> </li> <li>-</li> <li>- 8. Complete Set of Sanitary/Plumbing Documents <ul style="list-style-type: none"> <li>- 1. Plans</li> <li>- 2. Plumbing/Sanitary Specifications</li> <li>- 3. Design Analysis</li> <li>- 4. Isometric Drawing of the Whole System</li> </ul> </li> <li>-</li> <li>- 9. Complete set of Mechanical Documents <ul style="list-style-type: none"> <li>- 1. Plans</li> <li>- 2. Mechanical Specifications</li> <li>- 3. Isometric Drawing</li> <li>- 4. Detail drawing of all duct work installation indicating dampers, controls, filters, fire proofing, acoustical and thermal insulation</li> <li>- 5. Detail plan of machinery foundation and support</li> <li>- 6. Design computations and detailed plan of elevator, escalator and the like</li> </ul> </li> </ul>	
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	<ul style="list-style-type: none"> <li>- 7. Detailed plan of Fire Suppression System, location of automatic and smoke detections and alarm</li> <li>- 8. Hydraulic Analysis for pumps</li> <li>-</li> <li>- 10. Complete Set of Electronics Documents <ul style="list-style-type: none"> <li>- 1. Electronics Plans</li> <li>- 2. Electronic Specification</li> <li>- 3. Design Analysis (Battery Sizing Computation and Voltage Drop Computation)</li> <li>- 4. Riser Diagram and Single-Line Diagram</li> <li>-</li> </ul> </li> <li>- 11. Interior Fit-out</li> <li>- 12. Landscape</li> <li>-</li> <li>- Materials Testing</li> </ul>	
2	Demolition Works <ul style="list-style-type: none"> <li>- Dismantling/ Demolition of Building</li> <li>- Clearing of Ground Zero</li> <li>- Hauling of Debris</li> <li>- Hauling of Salvaged Materials to a designated area</li> </ul>	
3	Architectural Works <ul style="list-style-type: none"> <li>- Tinsmithry Works</li> <li>- Painting works</li> <li>- Ceiling</li> <li>- Floor Finishes</li> <li>- Doors</li> <li>- Windows</li> <li>- Façade Cladding/Designs</li> <li>- Signages</li> <li>- Curtain walls</li> </ul>	

	- Waterproofing	
4	<p>Structural Works</p> <ul style="list-style-type: none"> <li>- Excavation</li> <li>- Shoring Protection</li> <li>- Dewatering</li> <li>- Backfilling</li> <li>- Hauling of Unsited soils</li> <li>- Earth filling and Compaction</li> <li>- Piling Works</li> <li>- Foundation Works</li> <li>- Structural Steel Columns</li> <li>- Structural Steel Beams</li> <li>- RC Beams</li> <li>- RC Columns</li> <li>- Shear Walls</li> <li>- Slab</li> <li>- Steel Decking</li> <li>- Falseworks</li> <li>- Formworks</li> <li>- Trusses and Roof framing</li> </ul>	
5	<p>Electrical System Works</p> <ul style="list-style-type: none"> <li>- Lighting Fixtures</li> <li>- Power Outlets</li> <li>- Other Electrical Fixtures and Devices</li> <li>- Electrical Roughing ins</li> <li>- Main Distribution Panel</li> <li>- Electrical Wiring and Connections of Electrical Systems</li> <li>- Service Entrance</li> </ul>	
6	<p>Mechanical Works</p> <ul style="list-style-type: none"> <li>- Fire Suppression System</li> <li>- Air-conditioning System</li> <li>- Elevator System</li> <li>- Escalator System</li> <li>- Generator system</li> <li>- HVAC System</li> <li>- Gas Piping System</li> </ul>	
7	Plumbing and Sanitary Works	

	<ul style="list-style-type: none"> <li>- Sewer Lines</li> <li>- Water Lines</li> <li>- Fixtures</li> <li>- Features</li> <li>- Cistern tank</li> <li>- Elevated water tank</li> <li>- Sewage Treatment Plant</li> <li>- Storm Drainage System</li> <li>- Rainwater Harvesting Facility</li> <li>- Oil and Grease Interceptor systems</li> </ul>	
8	<p>Interior Fit-out</p> <ul style="list-style-type: none"> <li>- Wall Partitions and Finishes</li> <li>- Office System Partition</li> <li>- Built-in Furniture</li> <li>- Sound Proofing</li> </ul>	
9	<p>Information technology System Works</p> <ul style="list-style-type: none"> <li>- Server Rooms</li> <li>- IT Cabling</li> <li>- Communication Devices</li> <li>- Data and Telephone System (DTS)</li> <li>- Public Address System (PAS)</li> <li>- Closed-Circuit Television (CCTV) System</li> <li>- Biometric Access Control</li> <li>- Building Management System</li> </ul>	
10	<p>Landscape/Open Space</p> <ul style="list-style-type: none"> <li>- Landscaping</li> <li>- Fountain</li> <li>- Drainage System</li> <li>- Pavements</li> <li>- Benches</li> <li>- Site Development</li> </ul>	
<b>TOTAL</b>		<b>9,644,918,000.00</b>

**J. TIME FRAME**

The Contractor is required to complete the Project within an indicative period as shown below, to start upon the Contractor’s receipt and signing of Notice to Proceed. The time frame to be followed for the project is as follows:

**1. Design and Construction Schedule:**

ACTIVITY	Bi-monthly Schedule											
	1	2	3	4	5	6	7	8	9	10	11	12
Pre-Design including owner’s approval	15 C.D.											
Detailed Design including owner’s Approval	-----30 C.D.											
Application and issuance of Building Permits	-----30 C.D.											
Demolition Phase	-----	-----	-----	180 C.D.								
Construction Phase		540 C.D.	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

The duly signed Design Preparation Schedule should be prepared considering a timeline of fourteen (14) calendar days reckoned from the date of the issuance of the Notice of Award.

The duly signed Construction Schedule – PERT/CPM with manpower Schedule, Equipment Schedule and S-Curve should be prepared and submitted to consider the correct time duration of 720 calendar days reckoned from the timeline stated in the approved Notice to Proceed (NTP)

**K. PRELIMINARY DESIGN AND CONSTRUCTION STUDY**

No bidding and award of Design and Build contracts shall be made unless the required preliminary design and construction studies have been sufficiently carried out and duly approved by the procuring entity that shall include, among others, the following:

- Project Description
- Conceptual Design
- Performance Specification and Mapping
- Preliminary Investigations
- Utility locations

**L. ELIGIBILITY CRITERIA, GENERAL TERMS AND CONDITION AND SUBMITTALS ELIGIBILITY REQUIREMENTS:**

ITB Clause	
2.2	<p>The Funding Source is:</p> <p>Form the Supplemental Budget approved by the Sanggunian through Resolution No. _____ in the amount of Nine billion six hundred forty-four million nine hundred eighteen thousand dollars (PhP 9,644,918,000.00) inclusive of all applicable taxes and fees.</p> <p>Terms of Payment will be composed of:</p> <ul style="list-style-type: none"> <li>a) 10% advance / mobilization payment</li> <li>b) Monthly Progress Payments</li> </ul>
5.2	<p>For this purpose, contracts, similar to the Project refer to contracts which have the same major categories of work, which shall be:</p> <p><b>Design, Build, Operation and Maintenance of Government Offices, Structures, and Facilities completed within the last ten (10) years prior to the deadline for the submission and receipt of bids.</b></p>
7.1	<p><i>[Specify the portions of Works and the maximum percentage allowed to be subcontracted, which shall not be significant or material components of the Project as determined by the Procuring Entity.]</i></p> <p>Subcontracting for the project’s design phase (Detailed Engineering Design) is allowed provided that the amount should not exceed 10% of the contract price. Designer must have successfully or substantially completed the design of a project similar in nature and complexity as this contract under bidding and shall have earned a fee amounting to at least 50% of the ABC of the design component.</p>
10.3	<p>Prospective bidders must have at least a license category “AAA” and a license classification “Large B” from the Philippines Contractors Accreditation Board (PCAB) for General Engineering. The PCAB License must be valid and effective at the time of the submission of the bid. PCAB License (Allowable Ranges Contract Cost - Php 5 Billion up to Php 10 Billion. Special License if joint venture.</p>

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

Position	Particular Qualifications	Required Min. Years of Similar Experience	Required Min. Years of Total (Similar + Related Experience)
<b>Design Personnel</b>			
Design Architect	<ul style="list-style-type: none"> <li>● A Licensed Architect with experience of Designing Government Buildings focusing on the Philippine Architecture with Sustainable Design Solutions</li> <li>● With Doctorate Degree</li> </ul>	10	15
Structural Design Engineer	<ul style="list-style-type: none"> <li>● A Licensed Civil Engineer</li> <li>● ASEP member</li> <li>● With masteral on Structural Engineering</li> </ul>	5	15
Mechanical Design Engineer	A Licensed Professional Mechanical Engineer	5	15
Electrical & Electronics Design Engineer	A Licensed Professional Electrical & Electronics Engineer	5	15

Sanitary / Plumbing Design Engineer	A Licensed Sanitary Engineer	5	15
<b>Construction Personnel</b>			
Project Manager	A Licensed Civil Engineer with experience of constructing a multi-storey Government Building	10	15

Project Engineer	Civil A Licensed Civil Engineer	5	10
Project Architect	A Licensed Architect	5	10
Electrical & Electronics Engineer	A Licensed Professional Electrical & Electronics Engineer	5	10
Mechanical Engineer	A Licensed Professional Mechanical Engineer	5	10
Plumbing & Sanitary Engineer	A Licensed Sanitary Engineer	5	10
Health & Safety Engineer	Must be a DOLE Accredited Safety Officer	5	10
Property Manager	Must have experience in property management related to property of a Government Building with mixed-use developments, buildings, and parks including mechanical,	10	10



	electrical, fire protection system / equipment		
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Similar experience means design / construction / operation & maintenance experience of the same position and/or in the same/similar project category. Total experience means the total design/construction experience regardless of position or property category.

0.5	<p>The minimum major equipment requirements are the following:</p> <p>Bidders shall furnish Certified True Copies of Ownership and/or Lease during the post qualification of the winning bidder.</p>																																																																			
	<table border="1"> <thead> <tr> <th>No.</th> <th>Equipment</th> <th>Owned</th> <th>Owned or Leased</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Backhoe Hydraulic Excavator W.M. 0.50 cu.m., 128hp</td> <td>1</td> <td>1</td> <td>2</td> </tr> <tr> <td>2</td> <td>Backhoe with attachment 0.50-1.00 cu.m.</td> <td>2</td> <td>1</td> <td>3</td> </tr> <tr> <td>3</td> <td>Dump Truck 9-10 cu.m.</td> <td>3</td> <td>3</td> <td>6</td> </tr> <tr> <td>4</td> <td>Personnel Service Vehicle / Truck</td> <td>2</td> <td>-</td> <td>2</td> </tr> <tr> <td>5</td> <td>Generator Set - 350kw</td> <td>1</td> <td>1</td> <td>2</td> </tr> <tr> <td>6</td> <td>Truck mounted crane, 25 tone</td> <td>1</td> <td>-</td> <td>1</td> </tr> <tr> <td>7</td> <td>Concrete Vibrator</td> <td>4</td> <td>-</td> <td>4</td> </tr> <tr> <td>8</td> <td>Plate Compactor</td> <td>2</td> <td>-</td> <td>2</td> </tr> <tr> <td>9</td> <td>Welding Machines, 300 amp.</td> <td>6</td> <td>-</td> <td>6</td> </tr> <tr> <td>10</td> <td>One-Bagger Mixer</td> <td>4</td> <td>-</td> <td>4</td> </tr> <tr> <td>11</td> <td>Tower Crane</td> <td>-</td> <td>1</td> <td>1</td> </tr> <tr> <td colspan="2">Total Owned or Leased</td> <td>26</td> <td>7</td> <td>33</td> </tr> </tbody> </table>	No.	Equipment	Owned	Owned or Leased	Total	1	Backhoe Hydraulic Excavator W.M. 0.50 cu.m., 128hp	1	1	2	2	Backhoe with attachment 0.50-1.00 cu.m.	2	1	3	3	Dump Truck 9-10 cu.m.	3	3	6	4	Personnel Service Vehicle / Truck	2	-	2	5	Generator Set - 350kw	1	1	2	6	Truck mounted crane, 25 tone	1	-	1	7	Concrete Vibrator	4	-	4	8	Plate Compactor	2	-	2	9	Welding Machines, 300 amp.	6	-	6	10	One-Bagger Mixer	4	-	4	11	Tower Crane	-	1	1	Total Owned or Leased		26	7	33		
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	<p>Acceptable proof of ownership:</p> <ul style="list-style-type: none"> <li>● Official Receipt</li> <li>● Deed of Sale</li> <li>● OR/CR</li> <li>● Sales Invoice</li> <li>● Proforma Invoice supported by a Sales Invoice</li> <li>● Letter of Credit from bank with attached Purchase Order supported by a Sales Invoice</li> <li>● Acknowledgement Receipt from Supplier</li> <li>● Commercial Receipt / Commercial Invoice</li> <li>● Original Receipt with attached Packing List</li> <li>● Bill of Lading</li> <li>● Collection Receipt</li> <li>● Delivery Receipt</li> <li>● Lease Agreement</li> <li>● Under Purchase Agreement</li> </ul>
12	<i>[Insert Value Engineering clause if allowed.]</i>
15.1	<p>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:</p> <ol style="list-style-type: none"> <li>a. The amount of not less than <b>Php 192,898,360.00</b> <i>[(2%) of ABC]</i>, if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit;</li> <li>b. The amount of not less than <b>Php 482,245,900.00</b> <i>[(5%) of ABC]</i>, if bid security is in Surety Bond.</li> </ol>
19.2	Partial Bids are not allowed. The Project is packaged in a single lot and the lot shall not be divided into sub-lots for the purpose of bidding, evaluation, and contract award.
20	<i>[List licenses and permits relevant to the Project and the corresponding law requiring it e.g. Environmental Compliance Certificate, Certification that the project site is not within a geohazard zone, etc.]</i>

21	Additional contract documents relevant to the project that may be required by existing laws and/or the Procuring Entity, such as construction schedule and S-curve, manpower schedule, construction methods, equipment utilization schedule, construction safety and health program approved by the DOLE, and other acceptable tools of project scheduling.
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**M. MINIMUM REQUIREMENTS FOR CONSTRUCTION SAFETY AND HEALTH:**

**1. . General Requirements**

No Contractor or subcontractor shall require any employee to work in surroundings or under working conditions that are unsanitary, hazardous, or dangerous to his health or safety.

In order to meet this general requirement, the contractor must:

- a. Initiate and maintain programs (written or otherwise) to comply with this general requirement.
- b. Provide frequent and regular inspections of the job sites by competent persons
  - Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to prompt corrective measures to eliminate them.
- c. Prohibit the use of any machinery, tool, material, or equipment that is not in compliance with applicable requirements.
- d. Permit only those employees adequately trained to operate machinery or equipment.
- e. Provide training for all employees in:
  - Recognition and avoidance of unsafe conditions
  - Workplace safety and health requirements.
  - Applicable hazards, safe handling, and personal protective equipment necessary for handling poisons, caustics, flammables, and other harmful substances relevant to their job duties.
  - Specific hazards and procedures for entering confined spaces are applicable.

- f. Provisions of medical care and first aid kits.
- g. Develop An Effective Fire Protection And Prevention Plan.
- h. Ensure appropriate housekeeping measures including clear walkways and removal of combustible scrap and debris.
- i. Require the wearing of appropriate personal protective equipment such as hard hats, safety glasses, steel toe shoes, or other appropriate protective equipment in all operations.
- j. Develop an emergency action plan covering designated actions employers and employees must take to ensure employees safety from fire and other emergencies.
  - Plan must be in writing for employers with greater than 10 employees
  - All employees must be trained upon initial assignment on the parts of the other plan the employee needs to know in the event of an emergency.
- k. Provide access to hand washing facilities, toilets, and an adequate supply of drinking water.
- l. Provide safety and health signs that are clearly visible to construction workers and the public.
- m. Conduct regular safety meetings (toolbox meetings).
- n. Observe strict compliance of the IATF-DPWH Construction Safety Guidelines and enforce standard safety procedures throughout the contract period. Presence of Safety Officers required to record health conditions of workers daily.

## **N. DESIGN PARAMETERS**

### **1. ARCHITECTURAL WORKS**

#### **A. Codes & Standards**

The Architectural works shall be in accordance with the following laws, codes & standards, namely the following:

- a) National Building Code of the Philippines (PD1096)

- b) Philippine Green Building Code (referral code of PD1096)
- c) Architectural Law (RA9266 and its latest and amended IRR)
- d) Accessibility Law (BP344)
- e) Fire Code of the Philippines (RA9514)
- f) Existing Local Codes & Its Ordinances
- g) Other laws that apply to the Project.

Additionally, other standards shall apply, which are the following:

- a) Bureau of Product Standards (BPS)
- b) Underwriters Laboratory (UL)

### **B. General Drawing Guidelines**

- . All drawings shall be computer-drafted, and shall be submitted in printed format (20"x30" or larger if necessary) and electronic copies.
- . North sign and the orientation of plans shall be exactly the same in all architectural floor plans, and shall be consistent with all engineering works, and other technicalities involved in the Project.
- . Any existing buildings and new works shall be clearly indicated and labeled.
- . Detailed plans shall have a scale of not smaller than 1:50 mts. Should spot/blow-up details be required, it shall have a scale not smaller than 1:10mts.
- . Avoid notes such as "see Architectural Details" or "See Structural," and shall always refer to callout labeling to the specific detail drawing label, as well as its sheet number.

### **C. Site Plans**

- . Should site plans be needed, it shall have a scale of not smaller than 1:400mts.
- . Any other parameters that need to be taken note of on the site plan shall be indicated. This includes, but is not limited to existing structures and utilities, adjoining buildings, and others of similar nature.

### **D. Floor Plans**

- . All plans shall have a scale of 1:100mts, and shall have the same scale for all technical plans, may it be Architectural, Engineering, and others of similar nature except for each trade's site plan, detailed plans and spot details.

. Elevation and section callouts shall be indicated on every floor plan and shall be consistent with the elevation/section drawing.

. Plans shall be indicated with boxed room callout numbers, including the callout for floor and wall finishes.

. Floor elevations shall be indicated in the floor plans, as shall be in reference to the natural grade line or the established floor line of an adjoining existing structure.

. Any location of mechanical equipment (e.g. air conditioning shall be indicated in the floor plans). It shall also be consistent with the mechanical and electrical plans.

. Door Callouts shall be in circles, with a proper label and numbering (e.g. D-01). Similarly, window callouts shall be in hexagons with proper label and numbering (e.g. W-01)

#### **E. Elevations & Sections**

. Finish floor lines and top of truss lines shall have consistency in all the elevations, sections and structural plans and details.

#### **F. Reflected Ceiling Plans**

. Ceiling height of the room/area specified in reference to the finish floor line shall be indicated to ensure an established finished height in plan, as to also not rely on section plans.

. Plans shall indicate boxed room callout numbers, indicating its ceiling finish/es and lighting fixture/s.

. Location of fixtures (e.g. lighting, smoke detectors, air condition vents and others of similar nature) shall be indicated in the plans, which also shall be consistent in the electrical and mechanical plans.

#### **G. Roof Plans**

. Roof finish/es shall be indicated on the roof plans

. Location of downspouts shall be indicated in the roof plans

#### **H. Doors and Windows**

. All doors and windows shown on plans shall be indicated with proper label and numbering, and shall be reflected on the Door & Window schedule. Additionally, it shall indicate

what type of window, its location, material and accessories included and other special specifications.

## **I. Details**

. Provide at least one (1) bay section of a scale not smaller than 1:50 mts, preferably that cuts along the area with special construction design.

. To provide spot detail plans, elevations and sections of a scale not smaller than 1:10mts for any custom applications of the Project (e.g. gutters, eaves, parapet, cladding works and others of similar of nature)

. Necessary referencing and labeling shall be considered, should it be crucial to the development of the Project (e.g. centerline locations for toilet & pipes) and additionally shall have corresponding indication of sizes and/or dimensions.

## **2. BUILDING ARCHITECTURAL WORKS**

### **A. Floor Plans**

. Engineering works (structural, sanitary, plumbing electrical, mechanical, and others of similar nature) are required to uphold and refer to the architectural plans and specifications intended for the Project. If the engineering design/s shall have any interference on the architectural design, it shall be adjusted in such a manner that the architectural design and all its intent is upheld and not compromised.

. The architectural and engineering plans shall be holistic and consistent all throughout in terms of technicalities, may it be location of structural elements, placement of utilities, fixtures, piping, and others of similar nature. Similarly, all references on the plans specified in the architectural documents shall be consistent with the intended labels, dimensions, grid lines and others similar.

### **B. Walls**

. Generally, walls shall be designed and built of proper quality, and shall have insulation coefficient that is appropriate for its use on the Project.

. Layout of walls shall always be aligned, plumb, level, and square.

. Interior walls shall be floor-to-floor height to prevent cross contamination and for fire safety compartmentalization

- . Where wall tiles are to be used, the minimum size to be used shall be 600mm x 600mm
- . All edges, corners and intersections of tiles shall consider less tile cuts and proper alignment. Additionally, tile trims shall also be considered to provide clean terminations
- . Any specification/s proposed for the walls shall be submitted for approval before installation is applied into the Project.

### **C. Floors**

- . Floor tiles to be used shall be homogenous and of appropriate texture (e.g. non-skid for exterior and wet areas)
- . Should Floor Tiles be established for the Project, it shall have at least a minimum size of 600mm x 600mm.
- . Layout of walls shall always be aligned, plumb, level, and square.
- . All edges, corners and intersections of tiles shall consider less tile cuts and proper alignment. Additionally, tile trims shall also be considered to provide clean terminations
- . Thresholds shall and may be considered (e.g. door thresholds) so as long as it applies what is the aforementioned above.
- . Any specification/s proposed for the floor finishes shall be submitted for approval before installation is applied into the Project.

### **D. Ceiling Works**

- . Generally, ceiling systems shall be designed and built of proper quality, and shall consider insulation coefficients appropriate for the room/area/space it serves.
- . Interior ceiling height shall not be lower than 3m
- . Should acoustic ceiling/s with T-runners be used for the Project, layout should consider alignment, set-out points and consider less cuts at all times. Ceiling specifications should be appropriate for its function and location
- . Any specification/s proposed for the ceiling finishes shall be submitted for approval before installation is applied into the Project.



## **E. Doors & Windows**

. Generally, doors and windows should be maximized in height to allow more natural light and ventilation. It shall be designed and built of proper quality. Additionally, quality of material for the door/s and window/s shall consider its use to avoid easy wear and tear for excessive use, and must also consider water seepage.

Dimensions of doors shall have a minimum of the following:

1. 0.90m door leaf minimum size for public and private spaces, and for equipment passage.
2. 0.80m door leaf minimum size for service areas
3. Should it require to be smaller than the one specified above, it shall be informed and shall be approved before installation.

. Doors and windows shall be durable enough to withstand natural calamities such as earthquakes and typhoons

. Any specification/s proposed for the doors & windows of the Project shall be submitted for approval before installation is applied into the Project.

## **F. Roofing Works**

1. Roofing System/s shall be designed and built in proper quality, and shall also consider its insulation quality that is appropriate for the Project.

2. The design of the roof that is applied in the Project shall be designed as to anticipate inconveniences such as clogs, wear and tear of pipes, and others similar to nature.

3. In cases that valley or inside gutters is considered in the roof design of the Project, it shall be in stainless steel or concrete with membrane-type of waterproofing (especially for roof decks/flat roofs) and shall consider storm drainage volume to prevent overflowing or leakage.

4. The slope of the roof shall conform to the design intent of the Project at all times. Should the design intent be to create a seamless flat design, parapets may be considered provided that it should conceal the roof until its topmost part.

5. Any specification/s proposed for the roof finishes shall be submitted for approval before installation is applied into the Project.

## **G. Building Protection Works**

. Generally, Building Protection Works shall be designed and built of proper quality, and shall be appropriate to its use may it be thermal, moisture, or other means of protection.

. Moisture Vapor Barrier Works (wherever applicable) – all concrete floor slabs in direct contact with the ground shall provide moisture vapor barrier to stop movement of moisture from the ground.

6. Any specification/s proposed for the roof finishes shall be submitted for approval before installation is applied into the Project.

#### **H. Paintworks**

7. Generally, paint to be used shall be of proper quality and shall consider the proper color, texture and sheen that is intended for the design. Paint specification shall always be approved before installation.

8. Paint to be used shall be appropriate for its function and location and should consider practicality in maintenance.

9. Any specification/s proposed for the roof finishes shall be submitted for approval before installation is applied into the Project.

### **SOIL TREATMENT- TERMITE CONTROL**

#### **PART 1 GENERAL**

##### **1.01 RELATED DOCUMENTS**

A. Drawings and general provisions of Contract, including General and Supplementary Conditions, and Division-1 Specification Sections apply to this Section.

##### **1.02 SUMMARY**

A. Provide soil treatment for termite control, as herein specified for all areas and surfaces in contact with the ground.

##### **1.03 SUBMITTALS**

A. Submit manufacturer's technical data and application instructions.

B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

C. Soil Treatment Application Report: After application of termiticide is completed, submit report for

Owner's record information, including the following as applicable:

1. Date and time of application.
2. Moisture content of soil before application.
3. Brand name and manufacturer of termiticide.

4. Quantity of undiluted termiticide used.
5. Dilutions, methods, volumes, and rates of application used.
6. Areas of application.
7. Water source for application.

#### **1.04 QUALITY ASSURANCE**

- A. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work, including preparation of substrate and application.
- B. Engage a professional pest control operator, licensed in accordance with regulations of governing authorities for application of soil treatment solution.
  - Submit copy of license from Fertilizer and Pesticide Authority (FPA) of the Philippines.
- C. Use only termiticides, which is licensed by the Fertilizer and Pesticide Authority of the Philippines.
- D. Related Sections include the following:
  - Structural Engineering Specifications Section for Excavation Work.

#### **1.05 JOB CONDITIONS**

- A. Restrictions: Do not apply soil treatment solution until excavating, filling and grading operations are completed, except as otherwise required in construction operations.
- B. To ensure penetration, do not apply soil treatment to excessively wet soils or during inclement weather. Comply with handling and application instructions of the soil toxicant manufacturer.

#### **1.06 SPECIFIC PRODUCT WARRANTY**

- A. Furnish written warranty certifying that applied soil termiticide treatment will prevent infestation of subterranean termites and that if subterranean termite activity is discovered during warranty period, Contractor will re-treat soil and repair or replace damage caused by termite infestation.

Provide warranty for a period of five (5) years from date of treatment, signed by Applicator and Contractor. Where the Contractor/Applicator offers a three (3) year warranty provision for the project, it is then required that as part of the package the Contractor/Applicator submits proposal for reapplication after the third year warranty expires.

#### **1.07 DELIVERY & STORAGE**

- A. Insecticides shall be delivered to project site in sealed and labeled containers as supplied by manufacturer or formulator. The label shall be complete with application instructions and bear the label of the Manufacturer. Temporary storage of insecticides utilized at the project site will be made unlikely. Provisions are to be made to prevent unauthorized entry.

Separation from water systems and buildings should be made sufficient to prevent contamination by runoff, percolation, windblown particles, or vapors.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

A. Termiticide: Provide an FPA-registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to the product's FPA Registered Label.

B. Provide a solution consisting of one of the following chemical elements and concentrations. Other chemicals not classified under any of the following are not acceptable:

1. Chlorpyrifos.

a. Lentrek.

b. Dursban.

c. Other approved equal by the Architect.

2. Permethrin: 0.5 percent in water emulsion.

3. Other solutions acceptable to the Architect.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control. Proceed with application only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.

B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could

decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated,

except previously compacted areas under slabs and footings. Termiticides may be applied before

placing compacted fill under slabs if recommended by a termiticide manufacturer.

C. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

### **3.03 APPLICATIONS, GENERAL**

A. General: Comply with the most stringent requirements of authorities having jurisdiction.

### **3.04 APPLYING SOIL TREATMENT**

A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.

1. Slabs-on-Grade and Basement Slabs: Underground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
2. Foundations: Adjacent soil including soil along entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers, piers, and indicated bases; and along entire outside perimeter, from grade to bottom of footing. Avoid soil washout around Footings.
3. Crawlspace: Soil under and adjacent to foundations as previously indicated. Treat adjacent areas including around the entrance platform, porches, and equipment bases. Apply overall treatment only where attached concrete platforms and porches are on fill or ground.
4. Masonry: Treat voids.
5. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.

B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.

C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground supported slabs are installed. Use a waterproof barrier according to EPA-Registered Label instructions.

D. Post warning signs in areas of application.

E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following



## **CONCRETE PAVING PART 1 GENERAL**

### **1.01 RELATED DOCUMENTS**

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections apply to this Section.

### **1.02 SUMMARY**

A. This Section includes exterior concrete pavement, where required for the following areas and where indicated in Schedule of Finishes:

1. Curbs and gutters.
2. Walkways.
3. Pedestrian ramps, where indicated.
4. Unit paver base, where concrete or stone pavers are intended in the landscaped areas.
5. Other areas where required.

B. Related Sections include the following:

1. Section 02768. Stamped Concrete Pavement. (where required)
2. Section 03532. Concrete Floor Topping.
3. Section 067190. Water Repellents.
4. Section 07920. Joint Sealant. For the required joint fillers for concrete paving.
5. Structural Consultants Specifications. For the required reinforcements.

### **1.03 SUBMITTALS**

A. Product Data: Submit no later than 10 days after contract award a typed list of products specified in this Section.

B. Shop Drawings:

1. Submit shop drawings for reinforcing steel and accessories in accordance with ACI standards.
2. Paving Jointing and Pour Sequence Plan – submit six blueprints indicating the following:
  - a. Proposed layout of contraction, construction and isolation joints. Clearly delineate the three different joint types.
  - b. Layout of paving types as indicated on the Drawing Paving Schedule. Give overall dimensions of each paving type.
  - c. Concrete pour sequence. Indicated sequence of paving pour installation.

C. Statement of Mix Design: Submit (1) copy of Statement of Mix Design prepared by batch plant servicing Project for each load delivered to Project. Statement of Mix Design to contain following information:

1. Name, address, and telephone number of batch plant preparing statement of mix design.
2. Date of mix design.
3. Project location.
4. Contractor requesting load delivery.

5. Mix design number.
6. Gradations for sand and aggregate.
8. Material weights, specific gravity, and absolute volumes.
7. Basis of testing, i.e. UBC 2605 D4 and Title 24 2604 D4.
8. Water/cement ratio.
9. PSI rating.
10. Signature of testing laboratory manager.
11. Signed stamp from registered Project structural engineer or Architect.

#### **1.04 QUALITY ASSURANCE**

A. Code and Standards: Comply with local governing regulations if more stringent than herein specified.

#### **1.05 PROJECT CONDITIONS**

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

#### **APPLICABLE STANDARDS**

A. Specifications and recommended practices of American Concrete Institute (ACI), American Society for Testing and Materials (ASTM), The Uniform Building Code, and U.S. Patent #6,016,635 referred to in this Specification with their individual designations are to be considered part of this Specification.

B. Design and Control of Concrete Mixtures – Thirteenth Edition; Portland Cement Association.

#### **SUBSTITUTIONS**

None allowed unless approved in writing by the Owner's Authorized Representative.

#### **TESTING**

A testing agency may be designated by Owner or Owner's Authorized Representative. Testing personnel to meet ASTM E329 requirements.

#### **MOCK-UPS**

A. Prior to construction, provide (1) 1200mm x 1200mm x 100mm sample of concrete paving type specified on Drawings.



- B. Ensure that each mock-up contains joint types specified on project, i.e. construction, contraction, and isolation.
- C. Locate mock-ups in a conveniently accessible and protected place. Approved mock-ups will be standard for concrete paving installation review.
- D. Remove mock-ups from site upon completion of Work and approval by Owner's Authorized Representative.

### **PROJECT CONDITIONS**

Keep Work area clean, and in a safe and workmanlike condition so that rubbish, waste and debris do not interfere with work of other trades.

### **PRODUCT HANDLING**

Store materials in a dry and protected location. Protect reinforcing steel and dowels from rusting, deformation, staining, and moisture damage.

### **COORDINATION**

Notify Owner's Authorized Representative and contractors performing work related to installation of Contractor's Work in ample time, so as to allow sufficient time for them to perform their portion of work.

## **PART 2 PRODUCTS**

### **2.01 FORMS**

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

- Use flexible or curved forms for curves of a radius 100 feet (30.5 m) or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

### **2.02 STEEL REINFORCEMENT**

A. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

B. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.

C. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 60, deformed.

D. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 60. Cut bars true to length with ends square and free of burrs.

E. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60 (Grade 420), deformed bars; assembled with clips.

F. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

### **2.03 CONCRETE MATERIALS**

A. Portland Cement: ASTM C 150, Type I.

- Furnish Grey cement. Provide for regular concrete paving.

B. Normal Weight Aggregate: ASTM C 33, uniformly graded, from a single source, with coarse

aggregate as follows:

Regular Concrete Paving

1. Coarse Aggregate Size: As indicated in Structural Consultant's Specifications.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

### **2.04 WATER**

Free from deleterious materials such as oils, acids, and organic matter.

### **2.05 ADMIXTURES**

A. Air Entrainment Admixtures: Conforming to ASTM C260.

- Subject to compliance with requirements provide products by one of the following manufacturers.
  - a. Grace Construction Products; Daravair
  - b. Master Builders, Inc.; Micro-Air
  - c. Other approved equal by the Architect.

B. Water Reducing Admixtures: Conforming to ASTM C494, Type A.

- Acceptable Manufacturers:
  - a. Grace Construction Products;
  - b. Master Builders, Inc.; Micro-Air
  - c. Other approved equal by the Architect.

C. Shrinkage Reducing Admixtures: Conforming to ASTM C157.

- Subject to compliance with requirements provide products by one of the following
- 

#### **Manufacturers:**

- a. Grace Construction Products; Eclipse
- b. Eclipse Shrinkage Reducing Admixture is a liquid admixture, which dramatically reduces concrete shrinkage and curling due to drying.

### **2.06 READY MIXED CONCRETE**

A. Batched, mixed and transported in accordance with ASTM C94 - "Specifications for Ready Mixed Concrete."

## **2.07 REINFORCING**

A. Reinforcing Steel: Conforming to ASTM A615, clean and free of rust, dirt, grease or oils.

B. Tie Wire: 16-gauge plain cold-drawn steel conforming to ASTM A82, clean, and free of rust, dirt, grease or oils.

C. Supports for Reinforcement:

- Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars in place.

D. Polypropylene Fiber Reinforcement: 100% virgin multifilament polypropylene fibers, complying with ASTM C 1116 - Type III.

- Subject to compliance with requirements provide products by one of the following

### **Manufacturers:**

a. Fiber mesh; Fibermix Stealth – 6mm long

b. Grace Construction Products; Micro Fiber

- Application Rate: 1/2 lb./cy of mix.

## **2.08 ISOLATION JOINT MATERIALS**

- Refer to Section 07900 – Joint Sealers for isolation joint construction.

## **2.09 CONSTRUCTION JOINT DOWELS**

- 12mm diameter Rebar, free of dirt, grease, and oils. Encase 50 percent of each dowel in a Speed

Dowel plastic sleeve to allow parallel lateral movement of each dowel. 2.10 FLY ASH

A. ASTM C618 - Type F.

## **2.11 CURING MATERIALS**

A. Liquid-Membrane Forming and Sealing Curing Compound: Comply with ASTM C 309, Type I, Class A unless other types are acceptable to the Architect. Moisture loss no more than 0.055 gr./sq. cm. when applied at 200 sq. ft. / gal.

- Subject to compliance with requirements, products, which may be incorporated in the work, include, but are not limited to, the following: Provide for regular uncolored concrete paving.

a. "Masterseal"; Master Builders.

b. "A-H 3 Way Sealer"; Anti-Hydro Waterproofing Co.

c. "Ecocure"; Euclid Chemical Co.

d. "Clear Seal"; A.C. Horn.

e. "J-20 Acrylic Cure"; Dayton Superior.

f. "Sure Cure"; Kaufman Products Inc.

- g. "AR-30" W.R. Meadows.
  - h. "Spartan-Cote"; The Burke Co.
  - i. "Sealkure"; Toch Div. - Carboline.
  - j. "Kure-N-Seal"; Sonneborn-Contech.
  - k. "Polyclear"; Upco Chemical / USM Corp.
  - l. "L&M Cure"; L & M Construction Chemicals.
  - m. "Klearseal"; Setcon Industries.
  - n. "LR-152"; Protex Industries.
  - o. "Hardtop"; Gifford - Hill.
  - p. "Sika Antisol – E" by Sika Philippines
2. Lithocrete sealer for Architectural Concrete Paving.
- B. Anti-spalling Compound: Combination of boiled linseed oil and mineral spirits, complying with AASHTO M-233.

## **2.12 RELATED MATERIALS**

- A. Expansion Joint Materials: Comply with requirements of Section 07920, for preformed expansion joint fillers and sealers.
- ## **2.13 CONCRETE MIX, DESIGN & TESTING**
- B.. Comply with requirements of Section 03532 for concrete mix design, sampling and testing, and quality control and as herein specified.
- C. Design mix to produce normal-weight concrete consisting of portland cement, aggregate, and water to produce the following properties:
- 1. Compressive Strength: 3000 psi, minimum at 28 days, unless otherwise indicated.
  - 2. Slump Limits: 75mm (3 inches).
  - 3. Air Content: 5 to 8 percent.

## **PART 3 EXECUTION OF REGULAR CONCRETE PAVING**

### **3.01 SURFACE PREPARATION**

- A. Remove loose material from the compacted sub base surface immediately before placing concrete.
- B. Proof-roll prepared subbase surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

### **3.02 FORM CONSTRUCTION**

- A. Set forms to required grades and lines, braced and secured. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
- B. Check completed formwork for grade and alignment to following tolerances:
- 1. Top of forms not more than 3mm (1/8 inch) in 3 meters (10 feet).
  - 2. Vertical face on longitudinal axis, not more than 6mm (1/4 inch) in 3 meters (10 feet.)

- C. Clean forms after each use and coat with form release agent as required to ensure separation from
- D. Slope step treads at 6mm (1/4 inch) per 300mm to drain.

### **3.03 REINFORCEMENT**

- Locate, place, and support reinforcement as specified in Division-3 sections, unless otherwise indicated.

### **3.04 CONCRETE PLACEMENT**

A. General: Comply with requirements of Division-3 sections for mixing and placing concrete, and as herein specified.

B. Do not place concrete until the subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

C. Place concrete by methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than 1/2 hour, place a construction joint. When adjacent pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained sufficient strength to carry loads without injury.

D. Fabricated Bar Mats: Keep mats clean and free from excessive rust, and handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.

Place concrete in 2 operations; strike off initial pour for entire width of placement and to the required depth below the finish surface. Lay fabricated bar mats immediately in the final position. Place the top layer of concrete, strike off, and screed. Remove and replace portions of the bottom layer of concrete that have been placed more than 15 minutes without being covered by the top layer or using a bonding agent if acceptable to the Architect.

E. Curbs and Gutters: Automatic machines may be used for curb and gutter placement at Contractor's option. If machine placement is to be used, submit revised mix design and laboratory test results that meet or exceed minimums specified. Machine placement must produce curbs and gutters to required cross-section, lines, grades, finish and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified.

### 3.05 JOINTS

A. General: Construct expansion, weakened-plane (contraction), and construction joints true to line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Weakened-Plane (Contraction) Joints: Provide weakened-plane (contraction) joints, sectioning concrete into areas as shown on drawings. Construct weakened-plane joints for a depth equal to at least 1/4 concrete thickness, as follows:

1. Sawed Joints: Form weakened-plane joints with powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as the surface will not be torn, abraded, or otherwise damaged by cutting action.
2. Inserts: Use embedded strips of metal or sealed wood to form weakened-plane joints. Set strips into plastic concrete and carefully remove strips after concrete has hardened.

C. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for more than 1/2 hour, except where such placements terminate at expansion joints.

1. Construct joints as shown or, if not shown, use standard metal keyway-section forms.
2. Where load transfer-slip dowel devices are used, install so that one end of each dowel bar is free to move.

D. Expansion Joints: Provide pre-molded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated. Locate expansion joints at 50 feet o.c. for each pavement lane unless otherwise indicated. Extend joint fillers full width and depth of joint, not less than 1/2 inch (12.7mm) or more than 1 inch (25mm) below finished surface where joint sealer is indicated. if no joint sealer, place top of joint filler flush with finished concrete surface. Furnish joint fillers in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together. Protect top edge of joint filler

during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of the joint.

E. Fillers and Sealant: Comply with Section 07920 requirements for preparation of joints, materials, installation and performance.

### **3.06 CONCRETE FINISHING**

A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to a compact surface and produce a uniform texture.

B. After floating, test surface for trueness with a 3.0 meter ( 10-ft.) straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.

- Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if the area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots, and fill low spots. Refloat the surface immediately to uniform granular texture.

a. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to the line of traffic, to provide a uniform, gritty texture.

b. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float finished concrete surface perpendicular to line of traffic to provide a uniform, fineline texture.

c. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float finished

concrete surface 1.6mm to 3mm deep with a stiff-bristled broom, perpendicular to the line of traffic.

C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 12.7mm (1/2-inch) radius, unless otherwise indicated. Eliminate tool marks on concrete surfaces.

D. After completion of floating and when excess moisture or surface sheen has disappeared, provide trowel finish where indicated in the schedule of finishes.

### **3.07 CURING**

A. Protect and cure finished concrete paving in compliance with applicable requirements of Division-3 sections. Use membrane-forming curing and sealing compounds or approved moist-curing methods.

### **3.08 REPAIRS & PROTECTIONS**

A. Repair or replace broken or defective concrete, as directed by the Architect.

B. Drill test cores were directed by the Architect when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.

C. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

## **PART 4 EXECUTION OF ARCHITECTURAL CONCRETE PAVING**

### **4.01 SUBGRADE**

A. Subgrade to meet requirements of project's soils report.

B. Ensure that a minimum 2-inch layer of graded washed concrete sand compacted to 95 percent

Relative compaction is placed over subgrade prior to placing concrete.

C. Screed sand to a smooth plane.

D. Ensure that utilities, including irrigation lines are buried and compacted below the bottom of the sand layer.

E. Keep sand damp prior to placing concrete.

### **4.02 FORMING**

A. Be responsible for design and engineering of form work as well as its construction.

B. Ensure that Work conforms to recommended practice for concrete form work (ACI 347), latest edition.

C. Do not exceed 6000mm x 6000mm in a formed construction area.

D. Ensure that form lumber is new #2 or better grade wood. Do not use used form lumber.

E. Perform form layout with a digital electronic transit for line layout accuracy.



F. Allow forms to remain in place long enough to allow concrete to set properly. Remove forms when appropriate.

#### **4.03 DESIGN OF MIXES AND PROPORTIONING**

A. Proportion and mix of cement, aggregate, admixture and water to attain required plasticity and strength in accordance with current edition of ACI Manual of Concrete Practice and PCA "Design and Control of Concrete Mixtures."

B. Concrete mixtures to be designed by an approved commercial testing laboratory, using approved materials to obtain specified minimum compressive strength.

C. Concrete Mix Criteria:

1. Slump: 125mm, with a 6mm slump differential between successive batches. Obtain approval from the Owner's Authorized Representative if slump is outside these parameters.
2. Minimum PSI Rating at 28 days: 2,500.
3. Cement quantity per yard of mix:
  - a. Minimum: 6 sacks.
  - b. Maximum: 7 sacks.
4. Water/cement ratio: 0.65 – 0.67.
5. Sand: 70% of total mix.
6. Pea gravel: 30% of total mix.
7. Admixtures:
  - a. Air entrainment: Do not exceed 2%.
  - b. Shrinkage Reducing: Do not exceed 2% by weight of cement.
8. Non-Chloride Accelerators: Do not use corrosive accelerators such as calcium chloride.
9. Concrete Delivery: Use of concrete loads exceeding 90 minutes from time of batch plant must be approved by the Owner's Authorized Representative.
10. Ensure that batch plant guarantees single source supply for cement, sand, and aggregate for the entire project.

#### **4.04 JOINTING**

A. Refer to ACI 302 "Guide for Concrete Floor and Slab Construction" for work under this section.

B. Construction and Contraction Joints:

1. Sawcut construction and contraction joints in locations indicated on Drawings.
  2. Perform jointing with a new diamond tip circular saw.
1. Joint Width: Per Drawings. Do not exceed 4.6mm in width.
  2. Depth of sawcuts: 1/4th depth of slab.
  3. Decorative Sawcut Joints: Per Drawings.

4. Sawcut joints in a straight line with no overcutting.
5. Use a hand tool to sawcut up to vertical edges such as walls, steps, curbs and columns. No cutting into vertical surfaces will be allowed.

C. Isolation Joint Caulking:

- Install isolation joint caulking to be installed under Section 07900 – Joint Sealers.

#### **4.05 SEALING**

- A. Seal surface of paving using Sealer.
- B. Follow Sealer directions when applying the product. Refer to Section 07190.

### **STAMPED CONCRETE PAVEMENT**

#### **PART 1 GENERAL**

##### **1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specifications Sections, apply to this Section.

##### **1.02 SUMMARY**

- A. Extent of stamped concrete pavement is shown on drawings, including exterior paving where required for the courtyard, drop off and other areas where directed by the Architect and or where indicated on drawings.

1. Stamped pattern required for the project shall be as selected by the Architect from the manufacturers full range.
2. Required stamped concrete pavement is for pedestrian and vehicular type applications.

- B. Related Sections include the following:

1. Section 03532. For Concrete Floor Topping.
2. Section 07920. For Joint Sealant requirements.
3. Section 07190. Water Repellent. For sealer requirements.
4. Landscape Architects specified areas of applications for landscape purposes. Or site development drawings by the Architect, where stamped concrete applications are indicated.

##### **1.03 SUBMITTALS**

A. Provide samples, manufacturer's product data, test reports, and materials' certifications as required in referenced sections and joint fillers and sealers.

B. Test Certificates and Product data: Provide all required test certificates and product data for integral concrete coloring materials and sealers.

C. Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, plus other information specified.

#### **1.04 QUALITY ASSURANCE**

A. Code and Standards: Comply with local governing regulations if more stringent than herein specified.

B. Engage an experienced Installer who has successfully completed stamped cement concrete pavement installations similar in material, design, and extent to that indicated for Project.

C. Obtain each color, type, and variety of stenciled concrete paving, joint materials, and setting materials from a single source with resources to provide products and materials of consistent quality in appearance and physical properties without delaying progress of the Work.

D. Prior to installation of stamped concrete pavement, erect mock-ups for each form and pattern required to verify selections made under sample submittals. Build mock-ups to comply with the following requirements, using materials and same base construction including special features for expansion joints and contiguous work as indicated for the final unit of work.

1. Locate mock-ups on site in location and size indicated or, if not indicated, as directed by Architect.
2. Notify Architect one week in advance of the dates and times when mock-ups will be erected.
3. Demonstrate quality of workmanship that will be produced in the final unit of work.
4. Obtain Architect's acceptance of mock-ups before the start of the final unit of Work.
5. Retain and maintain mock-ups during construction in undisturbed condition as a standard for judging completed units of Work.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.

1. Use flexible spring steel forms or laminated boards to form radius bends as required.
2. Coat forms with a non-staining form release agent that will not discolor or deface the surface of concrete.

B. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A 185:” Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.”

1. Furnish in flat sheets, not rolls, unless otherwise acceptable to the Architect.
2. Size: 4 x 4/W1.4xW1.4.

C. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 60:” Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement”.

D. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 60: ”Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement”. Cut bars true to length with ends square and free of burrs.

E. Concrete Materials: Comply with requirements of applicable Division-3 sections for concrete materials, admixtures, bonding materials, curing materials, and others as required.

F. Color materials:

- Colored Dry-Shake Hardener: Factory-packaged dry combination of Portland cement, graded quartz aggregate, coloring pigments, and plasticizing admixture. Use coloring pigments that are finely ground, non fading mineral oxides interground with cement.

G. Expansion Joint Materials: Comply with requirements of applicable Division-7 sections for preformed expansion joint fillers and sealers.

H. Anti-spalling Compound: Combination of boiled linseed oil and mineral spirits, complying with AASHTO M-233.

I. Curing and Sealing Materials:

- Clear, Solvent-Borne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B. Applicable for pedestrian and vehicular traffic.
- 

J. Imprinting Tools as per manufacturer's standard design:

1. Stamp Mats: Semi rigid polyurethane mats with projecting textured and ridged underside capable of imprinting texture and joint patterns on plastic concrete.
2. Stamp Tools: Open-grid aluminum or rigid plastic stamp tool capable of imprinting joint patterns on plastic concrete

## **2.02 CONCRETE MIX, DESIGN & TESTING**

A. Comply with requirements of applicable Division-3 sections for concrete mix design, sampling and testing, and quality control and as herein specified.

B. Design mix to produce normal-weight concrete consisting of portland cement, aggregate, and

water to produce the following properties:

1. Compressive Strength: 3000 psi, minimum at 28 days, unless otherwise indicated.
2. Slump Limits: 75mm (3 inches).
3. Air Content: 5 to 8 percent.

C. Subject to compliance with requirements provide products by one of the following Stamped

Concrete Manufacturers:

1. Scofield: L.M. Scofield Company.
2. Adco Blue.
3. Bomanite.
4. Other approved equivalents by the Architect.

D. Provide where required for courtyard, drop off areas, and other areas where directed by the Architect. Refer to drawings and schedules.

E. Stamped Concrete Pavement Patterns and colors: As selected by the Architect and or as indicated in the Schedule of Finishes and Materials.

F. Miscellaneous Materials: As recommended by the Manufacturer.

## **2.03 RELATED MATERIALS**

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self expanding cork

B. Epoxy-Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows

- Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

C. Polyethylene Film: ASTM D 4397, 1 mil (0.025 mm) thick, clear.

### **PART 3 EXECUTION**

#### **3.01 SURFACE PREPARATION**

A. Remove loose material from the compacted sub-base surface immediately before placing concrete.

B. Proof-roll prepared sub-base surface to check for unstable areas and need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.

#### **3.02 FORM CONSTRUCTION**

A. Set forms to required grades and lines, braced and secured. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.

B. Check completed formwork for grade and alignment to following tolerances:

1. Top of forms not more than 3.175mm (1/8 inch) in 3 meters (10 feet).
2. Vertical face on longitudinal axis, not more than 6.35mm (1/4 inch) in 3 meters (10 feet).

C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

D. Slope step treads at 6.35mm (1/4 inch) per 300mm to drain.

#### **3.03 REINFORCEMENT**

A. Locate, place, and support reinforcement as specified in Structural Specification Sections, unless otherwise indicated.

#### **3.04 CONCRETE PLACEMENT**

A. General: Comply with requirements of Structural Specifications Sections for mixing and placing

B. Do not place concrete until the sub-base and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

C. Place concrete by methods that prevent segregation of mix. Consolidate concrete along face of

forms adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and

consolidation. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than 1/2 hour, place a construction joint. When adjacent pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained sufficient strength to carry loads without injury.

D. Fabricated Bar Mats: Keep mats clean and free from excessive rust, and handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities or replace units as required before placement. Set mats for a minimum 50mm (2-inch) overlap to adjacent mats.

Place concrete in 2 operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay fabricated bar mats immediately in the final position. Place the top layer of concrete, strike off, and screed. Remove and replace portions of the bottom layer of concrete that have been placed more than 15 minutes without being covered by the top layer or using a bonding agent if acceptable to the Architect.

E. Curbs and Gutters: Automatic machines may be used for curb and gutter placement at Contractor's option. If machine placement is to be used, submit revised mix design and laboratory test results that meet or exceed minimums specified. Machine placement must produce curbs and gutters to

required cross-section, lines, grades, finish and jointing as specified for formed concrete. If results are

not acceptable, remove and replace with formed concrete as specified.

F. Stamped Cement Concrete Pavement Pattern: Follow manufacturer's recommendation.

### **3.05 JOINTS**

A. General: Construct expansion, weakened-plane (contraction), and construction joints true to line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Weakened-Plane (Contraction) Joints: Provide weakened-plane (contraction) joints, sectioning

concrete into areas as shown on drawings. Construct weakened-plane joints for a depth equal to at least 6.35mm (1/4 inch) concrete thickness, as follows:

1. Sawed Joints: Form weakened-plane joints with powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete as soon as the surface will not be torn, abraded, or otherwise damaged by cutting action.
2. Inserts: Use embedded strips of metal or sealed wood to form weakened-plane joints. Set strips into plastic concrete and carefully remove strips after concrete has hardened.

C. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for more than 1/2 hour, except where such placements terminate at expansion joints.

1. Construct joints as shown or, if not shown, use standard metal keyway-section forms.
2. Where load transfer-slip dowel devices are used, they are installed so that one end of each dowel bar is free to move.

D. Expansion Joints: Provide pre-molded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.

- Locate expansion joints at 15 meters (50 feet) on center for each pavement lane unless

otherwise indicated. Extend joint fillers full width and depth of joint, not less than 12.7mm (1/2 inch) or more than 25.4mm (1 inch) below finished surface where joint sealer is indicated, or if not indicated, place top of joint filler flush with finished concrete surface. Furnish joint fillers in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together. Protect top edge or joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of the joint.

E. Fillers and Sealant: Comply with requirements of applicable Division-7 sections for preparation of joints, materials, installation and performance.

### **3.06 CONCRETE FINISHING**



- A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to a compact surface and produce a uniform texture.
- B. After floating, test the surface for trueness with a 10-ft. straightedge. Distribute concrete as required to remove surface irregularities, and re-float repaired areas to provide a continuous smooth finish.
- C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 12.7mm (1/2-inch) radius, unless otherwise indicated. Eliminate tool marks on concrete surfaces.
- D. After completion of floating and when excess moisture or surface sheen has disappeared, provide trowel finish where indicated in the schedule of finishes.
- E. Final Finishing and Coloring of Stamped/Stenciled Concrete Paving: As per manufacturer's instructions.

### **3.07 CURING**

- A. Protect and cure finished concrete paving in compliance with applicable requirements of Structural Specification Sections. Use membrane-forming curing and sealing compound or approved moist curing methods.

### **3.08 REPAIRS & PROTECTIONS**

- A. Repair or replace broken or defective concrete, as directed by the Architect.
- B. Drill test cores were directed by the Architect when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

## **CAST-IN-PLACE CONCRETE PART 1 - GENERAL**

### **1.1 SUMMARY**

A. This Section specifies cast-in place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes.

B. Cast-in-place concrete includes the following:

1. Grade walls, slabs and footings as detailed.
2. Pits and trenches as detailed.
3. Elevated floor slabs.

### **1.2 SUBMITTALS**

A. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, water stops, joint systems, curing compounds, dry-shake finish materials, and others.

B. Shop drawings for reinforcement detailing fabricating, bending, and placing concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, bent bar diagrams, and arrangement of concrete reinforcement. Include special reinforcing required for openings through concrete structures.

C. Laboratory test reports for concrete materials and mix design test.

### **1.3 QUALITY ASSURANCE**

A. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. American Concrete Institute (ACI) 301, "Specifications for Structural Concrete for Buildings."
2. ACI 318, "Building Code Requirements for Reinforced Concrete."
3. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."
4. National and Local Codes
- 5.

B. Concrete Testing Service: Engage a testing agency acceptable to the Architect/Engineer to perform material evaluation tests and to design concrete mixes.

C. Materials and installed work may require testing and retesting at any time during progress of Work. Tests, including retesting of rejected materials for installed Work, shall be done at Contractor's expense.

## **PART 2 - PRODUCTS**

### **2.1 FORM MATERIALS**

A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials to provide continuous, straight, smooth, exposed surfaces.

Furnish in largest practicable sizes to minimize number of joints and to conform to joint system indicated on the Drawings.

- Use overlaid plywood complying with the U.S. Product Standard PS-1 "A-C or B-B High Density Overlaid Concrete Form," Class I.

B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or another acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Form Release Agent: Provide commercial formulation form release agent with a maximum of 350 g/l volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties designed to prevent form deflection and to prevent spalling of concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to the plane of the exposed concrete surface.

- Provide ties that, when removed, will leave holes not larger than 1 inch in diameter in the concrete surface.

### **2.2 REINFORCING MATERIALS**

A. Reinforcing Bars: ASTM A 615 Grade 60, deformed. (Or as required by the Structural Engineer).

B. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar-type supports complying with CRSI specifications.

1. For pits, use supports with sand plates or horizontal runners where base material will not support chair legs.
2. For exposed-to-view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are protected by plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).

### **2.3 CONCRETE MATERIALS**

A. Portland Cement: ASTM C 150, Type I. Use one brand of cement throughout Project unless otherwise acceptable to the Owner's Representative.

B. Fly ash: ASTM C618, Type F with maximum loss on ignition (L.O.I.) of 6%.

C. Normal-Weight Aggregates: ASTM C 33 and as specified. Provide aggregates from a single source for exposed concrete.

1. For exposed exterior surfaces, do not use fine or coarse aggregates that contain substances that cause spalling.
2. Local aggregates not complying with ASTM C 33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to the Structural Engineer.

D. Water: Potable.

E. Admixtures, General: Provide concrete admixtures that contain not more than 0.1 percent chloride ions.

F. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

- Products: Unless otherwise directed by the Structural Engineer, provide products by one of the following:

- a. Air-Mix or AEA 92; Euclid Chemical Co.
- b. Darex AEA or Daravair, W.R. Grace & Co.
- c. MB-VR or Micro-Air; Master Builders, Inc.
- d. Sika AER; Sika Corp.
- e. Catexol AE260 or AE360; Axim

G. Water-Reducing Admixture: ASTM C 494, Type A.

- Products: Unless otherwise directed, provide products by one of the following:

- a. Eucon WR-75; Euclid Chemical Co.
- b. WRDA 20 or Hycol; W.R. Grace & Co.
- c. Pozzolith 220N, 200N or Polyheed; Master Builders, Inc.
- d. Plastocrete 161; Sika Corp.
- e. Catexol 1000N, 800N, 3500N, or 2000NI; Axim

H. High-Range Water-Reducing Admixture: ASTM C 494, Type F or Type G.

- Products: Unless otherwise directed, provide products by one of the following:

- a. Eucon 37; Euclid Chemical Co.

- b. WRDA 19 or Daracem; W.R. Grace & Co.
- c. Rheobuild 1000; Master Builders, Inc.
- d. Sikament 300; Sika Corp.
- e. Catexol 1000 SP-MN, or SuperFlux 200PC; Axim

I. Water-Reducing, Accelerating Admixture: ASTM C 494, Type E.

- Products: Unless otherwise directed, provide products by one of the following:
  - a. Accelguard 80; Euclid Chemical Co.
  - b. Pozzutec 20; Master Builders, Inc.
  - c. Catexol 2000 RHE; Axim.

J. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.

- Products: Unless otherwise directed, provide products by one of the following:
  - a. Eucon Retarder 75; Euclid Chemical Co.
  - b. Daratard-17; W.R. Grace & Co.
  - c. Pozzolith 100XR; Master Builders, Inc.
  - d. Plastiment; Sika Corporation.
  - e. Catexol 1000N or 1000R; Axim.

## **2.4 RELATED MATERIALS**

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd., complying with AASHTO M 182, Class 2.

C. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

1. Waterproof paper.
2. Polyethylene film.
3. Polyethylene-coated burlap.

D. Liquid Membrane-Forming Curing Compound: Liquid-type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.55 kg/sq. m when applied at 200 sq. ft./gal.

### **Do not use slabs on grade.**

- Products: Unless otherwise directed by the Structural Engineer, provide products by

one of the following:

- a. A-H 3 Way Sealer; Anti-Hydro Co., Inc.
- b. Spartan-Cote; The Burke Co.
- c. Conspec #1; Conspec Marketing & Mfg. Co.
- d. Sealco 309; Cormix Construction Chemicals.
- e. Day-Chem Cure and Seal; Dayton Superior Corp.
- f. Eucocure; Euclid Chemical Co.
- g. Horn Clear Seal; A.C. Horn, Inc.
- h. L&M Cure R; L&M Construction Chemicals, Inc.
- i. Masterkure; Master Builders, Inc.
- j. CS-309; W.R. Meadows, Inc.
- k. Seal N Kure; Metalcrete Industries.
- l. Kure-N-Seal; Sonneborn-Chemrex.
- m. Stontop CS2; Stonhard, Inc.

E. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete surfaces for temporary protection from rapid moisture loss.

**Do not use slabs on grade.**

- Products: Unless otherwise directed, provide products by one of the following:

- a. Aquafilm; Conspec Marketing and Mfg. Co.
- b. Eucobar; Euclid Chemical Co.
- c. E-Con; L&M Construction Chemicals, Inc.
- d. Confilm; Master Builders, Inc.
- e. Waterhold; Metalcrete Industries.

F. Bonding Agent: Bonding agent bonding freshly mixed concrete to hardened or existing concrete shall be either Sika Chemical Corp. "Armatex 110" , Sto Powercrete "Powerprep AC" or as required by the Structural Engineer.

G. Epoxy grout for anchor bolts and dowels shall be Rawl/Sika Foil Fast Epoxy Gel Inspection

System or other as approved by the Engineer.

H. Epoxy Adhesive: ASTM C 881, two-component material suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit Project requirements.

- Products: Unless otherwise directed, provide products by one of the following:

- a. Euco Epoxy System #452 or #620; Euclid Chemical Co.
- b. Concessive Standard Liquid; Master Builders, Inc.
- c. Sikadur 32 Hi-Mod; Sika Corp.

I. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl

rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete.

## **2.5 PROPORTIONING AND DESIGNING MIXES**

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use an independent testing agency acceptable to Structural Engineers for preparing and reporting proposed mix designs.

1. Limit the use of fly ash to not exceed 25 percent of cement content by weight.
2. Fly ash permitted in grade beams and walls, drilled piers, footings, piers, and pile caps.

B. Submit written reports to the Owner's Representative of each proposed mix for each class of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed and approved by the Structural Engineer.

C. Design mixes to provide normal weight concrete with the following properties as indicated on drawings and schedules: 1. 4000 psi, 28-day compressive strength; water-cement ratio, 0.55 maximum (non-air entrained), 0.50 maximum (air-entrained).

### **Required for machine foundations.**

2. 3000 psi, 28-day compressive strength; water-cement ratio, 0.62 maximum (non-air entrained).

D. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement

(W/C) ratios as follows:

1. Subjected to freezing and thawing: W/C 0.45.
2. Subjected to deicers/watertight: W/C 0.40.
3. Subjected to brackish water, salt spray, or deicers: W/C 0.40.

E. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement

as follows:

1. Ramps, slabs, and sloping surfaces: Not more than 3 inches.
2. Reinforced foundation systems: Not less than 1 inch and not more than 3 inches.
3. Concrete containing high-range water-reducing admixture (super plasticizer): Not more than 8 inches after adding admixture to site-verified 2 - 3 inch slump concrete.
4. Other concrete: Not more than 4 inches.

F. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by the Structural Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Engineer before use in Work.

## **2.6 ADMIXTURES**

A. Use water-reducing admixture or high-range water-reducing admixture (super plasticizer) in concrete, as required, for placement and workability.

B. Use high-range water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water-cement ratios below 0.50.

C. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within the following limits:

1. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure:

- a. 4.5 percent (moderate exposure) for 1-1/2 inch maximum aggregate.
- b. 4.5 percent (moderate exposure) for 1 inch maximum aggregate.
- c. 5.0 percent (moderate exposure) for 3/4 inch maximum aggregate.
- d. 5.5 percent (moderate exposure) for 1/2 inch maximum aggregate.

2. Other concrete not exposed to freezing, thawing, or hydraulic pressure, or to receive a surface hardener: 2 to 4 percent air.

D. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer's directions.

## **2.7 CONCRETE MIXING**

A. Job-Site Mixing: Mix concrete materials in appropriate drum-type batch machine mixer. For mixers of 1 cu. yd. or smaller capacity, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in the mixer, before any part of the batch is released. For mixers of capacity larger than 1 cu. yd., increase minimum 1-1/2 minutes of mixing time by 15 seconds for each additional 1 cu. yd.

- Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.



B. Ready-Mixed Concrete: Comply with requirements of ASTM C 94, and as specified.

- When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

A. Coordinate the installation of joint materials, vapor retarder/barrier, and other related materials with placement of forms and reinforcing steel.

### **3.2 FORMS**

A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:

1. Provide Class A tolerances for concrete surfaces exposed to view.
2. Provide Class C tolerances for other concrete surfaces.

B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in the Work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent cement paste from leaking.

C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like for easy removal.

D. Provide temporary openings for clean-outs and inspections where the interior area of formwork is inaccessible before and during concrete placement. Securely brace temporary openings and set tightly to forms to prevent losing concrete mortar. Locate temporary openings in forms at inconspicuous locations.

E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

### **3.3 PLACING REINFORCEMENT**

A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as specified.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bonds with concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required by the Engineer.

D. Place reinforcement to maintain minimum coverages as indicated for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

### **3.4 JOINTS**

A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure, as acceptable to the Structural Engineer.

B. Provide keyways at least 1-1/2 inches deep in construction joints in walls and between walls

and footings. Bulkheads designed and accepted for this purpose may be used for slabs.

C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through the sides of strip placements.

D. Use a bonding agent on existing concrete surfaces that will be joined with fresh concrete.

### **3.5 INSTALLING EMBEDDED ITEMS**

A. General: Set and build into formwork anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached.

B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

### **3.6 PREPARING FORM SURFACES**

A. General: Coat contact surfaces of forms with an approved, non residual, low-VOC, form coating compound before placing reinforcement.

B. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply according to the manufacturer's instructions.

- Coat steel forms with a nonstaining, rust-preventative material. Rust-stained steel formwork is not acceptable.

### **3.7 CONCRETE PLACEMENT**

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," and as specified.

C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, providing construction joints as specified. Deposit concrete to avoid segregation at its final location.

D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24

inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while the preceding layer is still plastic to avoid cold joints.

1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.
2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of

the

machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing the mix to segregate.

E. Cold-Weather Placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

F. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.

1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

G. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 deg F. Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is the Contractor's option.
2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to the Structural

Engineer.

### **3.8 FINISHING FORMED SURFACES**

A. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and a defective area repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

B. Smooth-Formed Finish: Provide a smooth-formed finish on formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, damp proofing, veneer plaster, painting, or another similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete at locations

where indicated or directed:

- Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

E. Elevated Floor Slabs: Apply a trowel finish.

- After floating, begin the first trowel-finish operation using a power-driven trowel. Begin final troweling when the surface produces a ringing sound as the trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances of F(F) 20 (floor flatness) and F(L) 17 (floor levelness) measured according to ASTM E 1155. Grind smooth any surface defects that would telegraph through the applied floor covering system.

### **3.9 MONOLITHIC SLAB FINISHES**

Trowel Finish: Apply a trowel finish to bottom of pits, trenches and similar surfaces exposed to view as a slab surface.

- After floating, begin the first trowel-finish operation using a power-driven trowel. Begin final troweling when the surface produces a ringing sound as the trowel is moved over the surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances of F(F) 20 (floor flatness) and F(L) 17 (floor levelness) measured according to ASTM E 1155. Grind smooth any surface defects that would telegraph through the applied floor covering system.

### **3.10 MISCELLANEOUS CONCRETE ITEMS**

Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as specified to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete Work.

### **3.11 CONCRETE CURING AND PROTECTION**

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before power floating and troweling. Non-Conforming or damaged concrete shall be replaced at no additional cost to the owner.

B. Start initial curing as soon as free water has disappeared from the concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.

C. Curing Methods: Cure concrete by curing compound, by moist curing, by moisture-retaining cover curing, or by combining these methods, as specified.

D. Provide moisture curing by the following methods:

1. Keep the concrete surface continuously wet by covering it with water.
2. Use continuous water-fog spray.
3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with a 4 inch lap over adjacent absorptive covers.

E. Provide moisture-retaining cover curing as follows:

- Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during the curing period using cover material and waterproof tape.

F. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

G. Curing Unformed Surfaces: Cure unformed surfaces, including slabs, floor topping, and other flat surfaces, by applying the appropriate curing method.

- Final cure concrete surfaces to receive finish flooring with a moisture-retaining cover, unless otherwise directed.

### **3.12 REMOVING FORMS**

A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.

B. Form-facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form-facing material without loosening or disturbing shores and supports.

### **3.13 REUSING FORMS**

A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces except as acceptable to the Architect/Engineer.

### **3.14 CONCRETE SURFACE REPAIRS**

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to the Engineer.

- All exposed grade beams and retaining walls shall be rubbed out (repaired) to cover any form imperfections, form ties, etc.

B. Mix dry-pack mortar, consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.

1. Cut out honeycombs, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 1

inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with a bonding agent. Place patching mortar before the bonding agent has dried.

2. For surfaces exposed to view, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

C. Repairing Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to the satisfaction of the Architect/Engineer. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes and fill with dry-pack mortar or precast cement cone plugs secured in place with a bonding agent.

- Repair concealed formed surfaces, where possible, containing defects that affect the concrete's durability. If defects cannot be repaired, remove and replace the concrete.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface tolerances specified for each surface and finish. Correct low and high areas as specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having the required slope.

1. Repair finished unformed surfaces containing defects that affect the concrete's durability. Surface defects include crazing and cracks in excess of 0.01 inch wide or that penetrate to the reinforcement or completely through non reinforced sections regardless of width, spalling, popouts, honeycombs, rock pockets, and other objectionable conditions.
2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
3. Correct low areas in unformed surfaces during or immediately after completing surface finishing operations by cutting out low areas and replacing them with patching mortar. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to the Engineer.
4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose reinforcing steel with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply a bonding agent. Mix patching concrete of the same materials to provide concrete of the same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in the same manner as adjacent concrete.



E. Repair isolated random cracks and single holes 1 inch or less in diameter by dry-pack method. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compounds. Place the dry-pack before the bonding agent has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched areas continuously moist for at least 72 hours.

F. Perform structural repairs with prior approval of the Structural Engineer for method and procedure, using specified epoxy adhesive and mortar.

G. Repair methods not specified above may be used, subject to acceptance of the Structural Engineer.

### **3.15 QUALITY CONTROL TESTING DURING CONSTRUCTION**

A. General: Employ a testing agency to perform tests and to submit test reports.

B. Sampling and testing for quality control during concrete placement may include the following, as directed by the Structural Engineer:

1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.

a. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.

b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.

c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below, when 80 deg F and above, and one test for each set of compressive-strength specimens.

d. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.

e. Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd. plus additional sets for each 50 cu. yd. more than the first 25 cu. yd. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.

3. When the total quantity of a given class of concrete is less than 50 cu.yd Structural Engineers may waive strength testing if adequate evidence of satisfactory strength is provided.

4. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

5. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.

C. Test results will be reported in writing to the Owner's Representative, Structural Engineer, ready-mix producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.

D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

E. Additional Tests: The testing agency will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Structural Engineer. Testing agencies may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

## **SECTION 03350 - CONCRETE FINISHES**

### **PART 1 GENERAL**

#### **1.01 RELATED WORK SPECIFIED ELSEWHERE**

A. Drawing and general provisions of Contract, including Supplementary Conditions, Division 1 Specification Sections, apply to this Section.

## **1.02 SUMMARY**

A. Extent of different concrete finishes are shown on drawings and in schedules.

B. Provide the following finishes as described herein, where required in Schedule of Finishes and Materials.

1. Troweled.
2. Brushed.
3. Floated.
4. Broomed.
5. Fair-faced finish (Rubbed).
6. Straight to finish structural slab, power and hand floated to receive scheduled floor finish.
7. Other finishes necessary in conjunction with the required floor finishes.

C. Related Sections include the following:

1. Section 03532. Concrete Floor Topping.
3. Concrete Specification Sections from Structural Consultant.

## **1.03 STANDARDS**

A. Where the specifications refer to a specific standard, other authoritative standards which ensure an equal or higher quality than the standards mentioned will also be acceptable. It will be incumbent on the Contractor to verify the equal or higher quality and submit comparative standards (both specified and proposed standards) for review.

B. Surface conditions and application of proprietary materials are to be in compliance with manufacturer's printed instructions.

## **1.04 SUBMITTALS**

A. Samples: Submit samples not less than 300 x 300mm size of each type of required concrete finish, indicating methods used to produce finishes. Architect's review will be for color and texture only.

## **1.05 QUALITY ASSURANCE**

A. Job Mock-Up: Apply surface finishes to sample concrete units or project control mock-up panels for observation by the Architect. Provide workmanship and procedures as required to match Architect's finish samples. Mock-up each surface finish for a 3m x 3m area with joints and edge termination details.

## **1.06 PROJECT CONDITIONS**

A. Allow concrete to cure not less than 72 hours before commencing surface finish operations, unless otherwise acceptable to the Architect.

B. Protect adjacent materials and finishes from dust, dirt and other surface or physical damage during finishing operations. Provide protections as required and remove from site at completion of work.

B. Repair or replace other work damaged by finishing operations, as directed by the Architect.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

A. Where materials, products, or equipment are specified by reference to a specific standard or by reference to a specific manufacturer, materials, products, or equipment which ensure an equal or higher quality than the standards or manufacturers mentioned will also be acceptable. It will be incumbent on the Contractor to verify the equal or higher quality and submit comparative data (both specified and proposed data) for review.

### **2.02 CURING**

A. General: All curing and sealing agents that are to be applied sequentially shall be the products of a single manufacturer. Where products of different manufacturers are used including proprietary topping and surfacing materials, confirm their compatibility with the respective manufacturers. All areas to receive sealant or caulking compounds shall be masked before application of curing or sealing agent.

B. Moist curing and concrete sealer requirements should be referred to the appropriate sections of the structural specifications.

C. Concrete floor hardeners should be referred to Section 03532.

### **2.03 MISCELLANEOUS MATERIALS**

A. Non-Shrink Patching and Surfacing Compound: For repair to flatwork, to fill form tie holes, honeycombs or form faults; shall not contain gypsum, ferrous metal, non-ferrous metal or corrosion promoting agents.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

Related unformed surfaces are to be struck off, floated and or troweled to produce texture consistent with adjacent formed surfaces or as indicated on the drawings.

### **3.02 PREPARATION**

A. Remove and replace defective concrete which is not properly formed, is out of alignment or level, or displays surface defects, unless Architect permits patching or other corrective measures. Permission to patch defective concrete is not a waiver of an Architect's right to require complete removal of defective work if patching does not, in his opinion, satisfactorily restore quality and appearance of surface.

- Perform patching, when permitted, in compliance with applicable provisions of the Structural Specifications.

### **3.03 FAIR-FACED CONCRETE FINISH (RUBBED)**

A. Begin surface grinding, using power-driven, abrasive stone grinders, after wearing course has hardened sufficiently to prevent dislodgement of aggregate particles. Keep surfaces wet during the grinding process. Remove ground-off material and flush with water.

B. Fill air holes, pits, and other blemishes with cement grout. Spread grout over surface and work into openings with a steel straight edge. Rub grout into the surface by using a grinding machine. Keep the surface moist an additional 3 days before final grinding.

C. When the surface is in proper condition, begin second or final grinding to remove grout film and polish surface. After final grinding and polishing, wash thoroughly and remove surplus material.

D. Conduct grinding operations and use such techniques as required to provide surface finish to match Architect's samples.

- Provide off-form, bare finish for all leasable areas and where required.

### **3.04 FLATWORK SURFACES - GENERAL**

A. Preparation: Set bulkheads and screed strips to facilitate continuous concrete placement and to produce cross sections within tolerances specified. For cambered steel or concrete beams, place screed strips or other indicators along the beam centerline to maintain constant slab

thickness. Float, trowel, broom, cure, seal and apply other surface treatments to the top of the structural slab or to the top of concrete fills as shown in the Contract Documents.

B. Power Float and Hand Float after water sheen has disappeared to push down aggregate, raise mortar, and level.

C. Power Trowel and Hand Trowel as soon as the surface can be worked without cement paste clinging to the blades.

D. Non-Slip: Where non-slip is called for with any finish, embed particles at the rate of 1 kilogram per square meter with the final tooling.

E. Tolerances:

1. Class A: Level to within 3 millimeters in 3 meters (1/1000).

**3.05** The surface of concrete topping and structural slab to be finished with one of the following surface finishes, level, to falls or fall and currents as specified:

A. Hand troweled or power floated to give a smooth non textured finish. Provide for slabs required in Schedules to receive hardener/dustproofer, epoxy coating, and other scheduled floor finishes where smooth substrate preparation is required.

1. Trowel to Class A tolerance.

2. Moist cure only.

3. Refer to drawings and details for the required groove and flute sizes and spacing, for areas where this type of finish is required for ramps.

B. Stiff brush to give a lightly roughened texture: For slabs to receive thickset ceramic tiles, homogenous tiles, and other finishes where required.

1. Trowel to Class A tolerance.

2. Striate uniformly at right angles to traffic, with a fine-haired broom.

C. Wood Float to give an even textured finish: For slabs to receive waterproofing and thin-set ceramic and homogeneous tiles. Remove fins and fill honeycombs or voids per waterproofing manufacturer's recommendation.

D. Steel trowel to give a smooth non textured finish: Slab and concrete topping to receive carpet tiles, laminated wood flooring, and other flooring finishes requiring untextured concrete finish.

E. Heavy Broomed Finish: For slabs to receive stamped concrete paving other flooring finishes requiring rough substrate preparation.

F. Items C to E shall be consolidated to Class A tolerance, moist cure only.

G. Refer to schedules for the Architects intended concrete substrate, whether slab is straight to finish or with concrete topping.

H. The finish is to be in accordance with the manufacturer's recommendations for the finish to be applied or laid.

### **3.06 CLEAN-UP & PROTECTION**

A. Maintain control of concrete chips, dust and debris in each area of work. Clean up and remove such material at completion of each day of application. Prevent migration of airborne materials by use of tarpaulins, wind breaks and similar containing devices.

B. Cooperate with other trades for protection of completed finishes.

## **BONDED ABRASIVE POLISHED CONCRETE FLOORS PART 1 – GENERAL**

### **1.1 SUMMARY**

A. Section Includes: Products and procedures for (coloring – if required) bonded abrasive polishing concrete floors using multi-step wet/dry mechanical process, and accessories indicated, specified, or required to complete polishing.

### **1.2 DEFINITIONS**

A. Terminology: As defined by CPAA.

B. Polished Concrete: The act of changing a concrete floor surface, with or without aggregate exposure, to achieve a specified level of gloss.

C. Bonded Abrasive Polished Concrete: The multi-step operation of mechanically grinding, honing, polishing of a concrete floor surface with bonded abrasives to cut a concrete floor surface and to refine each cut to the maximum potential to achieve a specified level of finished gloss as defined by the CPAA. This yields the most durable finish and requires the least amount of maintenance.

### **1.3 SUBMITTALS**

A. Product Data: Manufacturer's technical literature for each product indicated, specified, or required. Include manufacturer's technical data, application instructions, and recommendations.

- B. Installer Qualifications: Data for company, principal personnel, experience, and training specified in PART 1 “Quality Assurance” Article.
- C. Field Quality Control – Dynamic Coefficient of Friction Test Reports: Reports of testing specified in PART 3 “Field Quality Control” Article.
- D. Field Quality Control – Static Coefficient of friction test reports: report of testing specified in Part 3 “Field Quality Control” article.
- E. Maintenance Data: For inclusion in the maintenance manual required by Division 01.
  - 1. Include instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use.
  - 2. Include precautions against cleaning products and methods which may be detrimental to finishes and performance.

#### **1.4 QUALITY ASSURANCE**

- A. Polisher Qualifications:
  - 1. Experience: Company experienced in performing specified work similar in design, products, and extent to scope of this Project; with a record of successful in-service performance; and with sufficient production capability, facilities, and personnel to produce specified work.
  - 2. . Supervision: Maintain competent supervisor who is at Project during times specified work is in progress, and is currently certified as Craftsman - Level I or higher by CPAA.
  - 3. . Manufacturer Qualification: Approved by manufacturer to apply liquid applied products.
- B. Walkway Auditor: Certified by CPAA or NFSI to test bonded abrasive polished concrete floors for dynamic and static coefficient of friction according to ANSI B101.1 and B101.3.
- C. Coefficient of Friction: Achieve following coefficient of friction by field quality control testing in accordance to the following standards:
  - 1. ANSI B101.1 Static Coefficient of Friction - Achieve a minimum of .42 for level floor surfaces.
  - 2. ANSI B101.3 Dynamic Coefficient of Friction - Achieve a minimum of .35 for level floor surfaces.
- D. Field Mock-up: Before performing work of this Section, provide following field mock-up to verify selections made under submittals and to demonstrate aesthetic effects of polishing.



Approval does not constitute approval of deviations from Contract Documents, unless the Architect specifically approves deviations in writing.

1. Form, reinforce, and cast concrete slab for 10 foot square field mock-up.
2. Concrete shall be the same mix design as scheduled for Project.
3. Placement and finishing work shall be performed by the same personnel as will place and finish concrete for the Project.
4. Mock-up shall be representative of work to be expected.
5. Perform grinding, honing, and polishing work as scheduled for Project using same personnel as will perform work for Project.
6. Approval is for following aesthetic qualities:
  - a. Compliance with approved submittals.
  - b. Compliance with specified aggregate exposure.
  - c. Compliance with specified finished gloss level.
  - d. Compliance with specified color. (If required.)
7. Obtain Architect's approval before starting work on Project.
8. Protect and maintain approved field mock-ups during construction in an undisturbed condition as a standard for judging completed work.

E. Pre-Installation of Concrete Conference: Prior to placing concrete for areas scheduled for polishing, conduct conference at Project to comply with requirements of applicable Division 01

Sections.

1. Required Attendees:

- a. Owner.
- b. Architect.
- c. Contractor, including supervisor.
- d. Concrete producer.
- e. Concrete finisher, including supervisor.
- f. Concrete polisher, including supervisor.
- g. Technical representative of liquid applied product manufacturers.
- h. Walkway auditor.

2. Minimum Agenda: Polisher shall demonstrate understanding of work required by reviewing and discussing procedures for, but not limited to, following:

- a. Tour field mock-up and representative areas of required work, discuss and evaluate for compliance with Contract Documents, including substrate conditions, surface preparations, sequence of procedures, and other preparatory work performed by other installers.
- b. Review Contract Document requirements.
- c. Review approved submittals and field mock-up.
- d. Review procedures, including, but not limited to:

- Applicable Division 03 Section on cast-in-place concrete
  - a. Specific mix design.
  - b. Specified curing methods/procedures.
  - c. Projected 3, 10, and 28 day compressive strength test related to specified aggregates exposure for finished floor and project phasing.
  - d. Protection of concrete substrate during construction and prior to polishing process
  - e. Project phasing and scheduling for each step of grinding, honing and polishing operations including, but not limited to:
    - i. Quality of qualified personnel committed to the project.
    - ii. Quality and size of grinders committed to the project.
    - iii. Proper disposal of concrete slurry and/or concrete dust.
  - f. Details of each step of grinding, honing, and polishing operations.
    - i) Application of color. (If required.)
    - ii) Application of liquid applied products.
    - iii) Protecting polished concrete floors after polishing work is complete.
- 3. Reports: Record discussions, including decisions and agreements reached, and furnish copy of record to each party attending.

### **1.5 FIELD CONDITIONS**

- A. Damage and Stain Prevention: Take precautions to prevent damage and staining of concrete surfaces to be polished.
  - 1. Prohibit use of markers, spray paint, and soapstone.
  - 2. Prohibit improper application of liquid membrane film forming curing compounds.
  - 3. Prohibit vehicle parking over concrete surfaces.
  - 4. Prohibit pipe-cutting operations over concrete surfaces.
  - 5. Prohibit storage of any items over concrete surfaces for not less than 28 days after concrete placement.
  - 6. Prohibit ferrous metals storage over concrete surfaces.
  - 7. Protect from petroleum, oil, hydraulic fluid, or other liquid dripping from equipment working over concrete surfaces.
  - 8. Protect from acids and acidic detergents contacting concrete surfaces.
  - 9. Protect from painting activities over concrete surfaces.
- B. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting liquid applied product application.

## **PART 2 – PRODUCTS**

### **2.1 LIQUID APPLIED PRODUCTS**

A. Liquid Densifier: An Aqueous solution of Silicon Dioxide dissolved in one of the following Hydroxides that penetrates into the concrete surface and reacts with the Calcium Hydroxide to provide a permanent chemical reaction that hardens and densifies the wear surface of the cementitious portion of the concrete. All of the following have the same chemistry varying only by the alkali used for solubility of the Silicon Dioxide.

1. Sodium Silicate
2. Potassium Silicate
3. Lithium Silicate
4. Alkaline solution of Colloidal Silicates or Silica

B. Dye: Non-film forming soluble colorant dissolved in a carrier designed to penetrate and alter coloration and appearance of a concrete floor surface without a chemical reaction.

C. Pigmented Micro Stains: Fine pigment particles ( $<3.9 \times 10^{-4}$  inches) suspended in

D. Water-based silicate solution that penetrates concrete and reacts with calcium hydroxide to lock in color particles.

E. Sealer - Semi Impregnating Stain Protection: A film forming material which will penetrate into the polished and densified concrete leaving a protective surface film of less than .05 mils which meets the OSHA requirements for slip resistance as tested by ASTM D 2047 and stain resistance of ASTM D 1308

F. Sealer - Impregnating Stain Protection: Non film forming stain and food resistant penetrating sealer designed to be applied to densified and polished concrete which meets the requirements of OSHA for slip resistance as tested by ASTM D 2047 and stain resistance of ASTM D 1308.

### **2.2 ACCESSORIES**

A. Repair Material: A product that is designed to repair cracks and surface imperfections. The specified material must have sufficient bonding capabilities to adhere after the polishing to the concrete surface and provide abrasion resistance equal to or greater than the surrounding concrete substrate.

B. Grout Material: A thin mortar used for filling spaces. Acceptable products shall be:  
a. Epoxy, urethane, polyurea, or polyaspartic resins.

- b. Latex or acrylic binders mixed with cement dust from previous grinding steps.
- c. Silicate binders mixed with cement dust from previous grinding steps.

C. Protective Cover: Non-woven, puncture and tear resistant, polypropylene fibers laminated with a multi-ply, textured membrane, not less than 18 mils in thickness.

### **2.3 POLISHING EQUIPMENT**

A. Field Grinding and Polishing Equipment:

1. A multiple head, counter rotating, walk behind or ride on machine, of various size and weights, with diamond tooling affixed to the head for the purpose of grinding concrete. Excludes janitorial maintenance equipment.
2. If dry grinding, honing, or polishing, use dust extraction equipment with flow rate suitable for dust generated, with squeegee attachments.
3. If wet grinding, honing, or polishing, use slurry extraction equipment suitable for slurry removal and containment prior to proper disposal.

B. Edge Grinding and Polishing Equipment: Hand-held or walk-behind machines which produce the same results, without noticeable differences, as field grinding and polishing equipment.

C. Burnishing Equipment: High speed walk-behind or ride-on machines capable of generating 1000 to 2000 revolutions per minute and with sufficient head pressure of not less than 20 pounds to raise floor temperature by 20 degrees F.

D. Diamond Tooling: Abrasive tools that contain industrial grade diamonds within a bonded matrix (such as metallic, resinous, ceramic, etc) that are attached to rotating heads to refine the concrete substrate.

1. Bonded Abrasive: Abrasive medium that is held within a bonding that erodes away to expose new abrasive medium as it is used.

2. Metal Bond Tooling: Diamond tooling that contains industrial grade diamonds with a metallic

bonded matrix that is attached to rotating heads to refine the concrete substrate. These tools are

available in levels of soft, medium, and hard metallic matrices that are matched with contrasting concrete substrates (i.e. hard matrix/soft concrete, medium matrix/medium concrete, soft

matrix/hard concrete) and are typically used in the grinding and early honing stages of the polishing process.

3. Resin Bond Tooling: Diamond tooling that contains industrial grade diamonds within a resinous bonded matrix (poly-phenolic, ester-phenolic, thermoplastic-phenolic) that is attached to rotating heads to refine the concrete substrate. Resin bond tooling does not have

the soft/medium/hard characteristics of metal bond tooling and are typically used for the later honing and polishing stages of the polishing process.

4. Hybrid Tooling: Diamond tooling that combines metal bond and resin bond that has the characteristics of both types of tooling. These types of tools are typically used as either transitional tooling from metal bond tools to resin bond tools or as a first cut tool on smooth concrete surfaces.

5. Transitional Tooling: Diamond tooling that is used to refine the scratch pattern of metal bond tooling prior to the application of resin bond tooling in an effort to extend the life of resin bond tooling and to create a better foundation for the polishing process.

6. Abrasive Pad: An abrasive pad, resembling a typical floor maintenance burnishing pad, that has the capability of refining the concrete surface on a microscopic level that may or may not contain industrial grade diamonds. These pads are typically used for the maintenance and/or restoration of previously installed polished concrete flooring.

### **PART 3 – EXECUTION**

#### **3.1 EXAMINATION**

A. Acceptance of Surfaces and Conditions:

1. Examine substrates to be polished for compliance with requirements and other conditions affecting performance.

a. Concrete Finished Floor Flatness according to applicable Division 03 Section on cast-in place concrete.

b. Concrete curing methods according to applicable Division 03 Section on cast-in-place concrete.

c. Concrete Compressive strength per according to applicable Division 03 Section on cast-in-place concrete.

B. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents.

C. Starting work within a particular area will be construed as acceptance of surface conditions.

#### **3.2 PREPARATION**

A. Cleaning New Concrete Surfaces:

1. Prepare and clean concrete surfaces.

2. Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form release agents, dust, dirt, grease, oil, paint splatter, and other contaminants incompatible with liquid applied products and polishing.

#### **3.3 VAPOR TESTING CONCRETE FLOORS (If Required for Colored Finish)**

A. Alkalinity:

1. Test Method: Measure pH according to method indicated in ASTM F 710.

2. Acceptable Results: pH between 8 and 10.

B. Moisture Vapor Transmission Rate:

1. Test Method: Perform anhydrous calcium chloride test according to ASTM F 1869.

2. Acceptable Results: Not more than 5 pounds per 1000 square feet in 24 hours.

C. Relative Humidity:

1. Test Method: Perform relative humidity test using in situ probes according to ASTM F 2170.

2. Acceptable Results: Not more than 75 percent.

### **3.4 COLORING CONCRETE FLOORS (If Required.)**

A. Dye or Pigmented Micro Stain Application:

1. Apply solution by methods and techniques required by manufacturer to produce finish matching approved field mock-ups.

2. Maintain wet edge, working newly applied solution into edges of adjacent wet edges of previously treated surfaces.

3. Maintain consistent saturation throughout the application.

4. Avoid splashing, dripping, or puddling of solution on adjacent substrates.

5. When color matches approved mock-ups, neutralize as required by the manufacturer.

### **3.5 POLISHING CONCRETE FLOORS**

A. Perform all polishing procedures to ensure a consistent appearance from wall to wall.

B. Initial Grinding:

1. Use grinding equipment with metal or semi-metal bonded tooling.

2. Begin grinding in one direction using sufficient size equipment and diamond tooling to meet specified aggregate exposure class.

3. Make sequential passes with each pass perpendicular to the previous pass using finer grit tool with each pass, up to 100 grit metal bonded tooling.

4. Achieve maximum refinement with each pass before proceeding to finer grit tools.

5. Clean the floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind an auto scrubber suitable to remove all visible loose debris and dust.

6. Continue grinding until aggregate exposure matches approved field mock-ups.

C. Treating Surface Imperfections:

1. Mix patching compound or grout material with dust created by grinding operations, manufacturer's tint, or sand to match the color of adjacent concrete surfaces.

2. Fill surface imperfections including, but not limited to, holes, surface damage, small and micro cracks, air holes, pop-outs, and voids with grout to eliminate micro pitting in finished work.

3. Work compound and treatment until color differences between concrete surface and filled surface imperfections are not reasonably noticeable when viewed from 10 feet away under lighting conditions that will be present after construction.

D. Liquid Densifier Application: Apply undiluted to point of rejection, remove excess liquid, and allow curing according to manufacturer's instructions.

E. Grout Grinding:

1. Use grinding equipment and appropriate grit and bond diamond tooling.
2. Apply grout, forced into the pore structure of the concrete substrate, to fill surface imperfections.
3. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.

F. Honing:

1. Use grinding equipment with hybrid or resin bonded tooling.
2. Hone concrete in one direction starting with a 100 grit tooling and make as many sequential passes as required to remove scratches, each pass perpendicular to previous pass, up to 400 grit tooling reaching maximum refinement with each pass before proceeding to finer grit tooling.
3. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.

G. Polishing:

1. Use polishing equipment with resin-bonded tooling.
2. Begin polishing in one direction starting with 800 grit tooling.
3. Make sequential passes with each pass perpendicular to the previous pass using finer grit tooling with each pass until the specified level of gloss has been achieved.
4. Achieve maximum refinement with each pass before proceeding to finer grit pads.
5. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.
6. Stain Protection: Uniformly apply and remove excessive liquid according to manufacturer's instructions. Final film thickness should be less than .05 mils after cure.
7. Final Polish: Using burnishing equipment and finest grit abrasive pads, burnish to uniform reflective sheen matching approved field mock-up.

H. Final Polished Concrete Floor Finish: (Verify Final Class of Aggregate Exposure with the Architect.)

1. Aggregate Exposure Class A – Cream Finish: Polish Portland cement paste resulting in little or no aggregate exposure.
2. Aggregate Exposure Class B – Fine / Sand Aggregate Finish: Remove not more than 1/16 inch of concrete surface by grinding and polishing resulting in majority of exposure displaying fine aggregate with no, or small amount of, medium aggregate at random locations.
3. Aggregate Exposure Class C – Medium Aggregate Finish: Remove not more than 1/8 inch of concrete surface by grinding and polishing resulting in the majority of exposure displaying medium aggregate with no, or small amount of, large aggregate at random locations.
4. Aggregate Exposure Class D – Large Aggregate Finish: Remove not more than 1/4 inch of concrete surface by grinding and polishing resulting in majority of exposure displaying large aggregate with no, or small amount of, fine aggregate at random locations
5. Finished Gloss Level 1 – Low Gloss Appearance:
  - a. Procedure: Recommended not less than 4 step process with full refinement of each diamond tool with one application of densifier.
  - b. Gloss Measurement: Determine the specular gloss by incorporating the following:
    - 1.) Reflective Clarity Reading: Not less than 20 according to ASTM D5767 prior to the application of sealers.
    - 2.) Reflective Sheen Reading: Not less than 15 according to ASTM D523 prior to the application of sealers.
6. Finished Gloss Level 2 – Medium Gloss Appearance:
  - a. Procedure: Recommended not less than 4 step process with full refinement of each diamond tool with one application of densifier.
  - b. Gloss Measurement: Determine the specular gloss by incorporating the following:
    - 1.) Reflective Clarity Reading: Not less than 55 according to ASTM D5767 prior to the application of sealers.
    - 2.) Reflective Sheen Reading: Not less than 25 according to ASTM D523 prior to the application of sealers.
7. Finished Gloss Level 3 – High Gloss Appearance:
  - a. Procedure: Recommended not less than 4 steps with full refinement of each diamond tool with one application of densifier.
  - b. Gloss Measurement: Determine the specular gloss by incorporating the following:
    - 1.) Reflective Clarity Reading: Not less than 65 according to ASTM D5767 prior to the application of sealers.
    - 2.) Reflective Sheen Reading: Not less than 35 according to ASTM D523 prior to the application of sealers.



8. Finished Gloss Level 4 – Very High Gloss Appearance:
- a. Procedure: Recommended not less than 4 steps with full refinement of each diamond tool with one application of densifier.
  - b. Gloss Measurement: Determine the specular gloss by incorporating the following:
    - 1.) Reflective Clarity Reading: Not less than 85 according to ASTM D5767 prior to the application of sealers.
    - 2.) Reflective Sheen Reading: Not less than 50 according to ASTM D523 prior to the application of sealers.

### **3.6 FIELD QUALITY CONTROL**

- A. Field Testing: Engage a qualified walkway auditor to perform field testing to determine if polished concrete floor finish complies with specified coefficient of friction;
- 1. ANSI B101.1 for static coefficient of friction
  - 2. ANSI B101.3 for dynamic coefficient of friction

### **3.7 CLOSEOUT ACTIVITIES**

- A. Maintenance Training: CPAA Craftsman shall train Owner's designated personnel in proper procedures for maintaining polished concrete floor.

### **3.8 PROTECTION**

- A. Covering: After completion of polishing, protect polished floors from subsequent construction activities with protective covering.

## **CONCRETE FLOOR TOPPING**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections apply to this Section.

#### **1.02 SUMMARY**

- A. Extent of concrete floor toppings is shown on drawings and in the Schedule of Finishes.
- B. Types of concrete floor toppings include:
- 1. Standard aggregate toppings 20684.16 kPa (3000 psi) for floors, stair landings, treads, decks, parking (if required) and protection course over waterproofing.
    - a. Provide with the required scheduled floor finish as indicated in the Schedule of Finishes and in Section 03350 and Schedule of Finishes.
- C. Related Sections include the following:

1. Section 03350. Concrete Finishes.
2. Specifications from Structural Consultant.
3. Schedule of Finishes.

### **1.03 SUBMITTALS**

A. Furnish data, samples, laboratory test reports, and materials certificates as specified by the Structural Consultant.

## **PART 2 PRODUCTS**

### **2.01 CEMENT & AGGREGATES**

A. Portland Cement: ASTM C 150, Type I.

1. Furnish Grey cement.

B. Standard Aggregate: ASTM C 33, and as follows:

1. Fine aggregate, consisting of sand or crushed stone screenings, clean, hard, free from deleterious matter. Grade by weight to pass sieves as follows:

- a. 9.53mm (3/8") - 100 percent.
- b. No. 4 - 95-100 percent.
- c. No. 8 - 80-90 percent.
- d. No. 16 - 50-75 percent.
- e. No. 30 - 30-50 percent.
- f. No. 50 - 10-20 percent.
- g. No. 100 - 2-5 percent.

2. Coarse aggregate consisting of gravel or crushed stone, clean, hard, free from deleterious matter. Grade by weight to pass sieves as follows:

- a. 12.7mm (1/2") - 100 percent.
- b. 9.525mm (3/8") - 30-50 percent.
- c. No. 4 - 0-15 percent.
- d. No. 8 - 0-5 percent.

C. Reinforcement: ASTM A 185, welded steel wire fabric, where indicated.

D. Miscellaneous Materials:

1. Epoxy Adhesive: ASTM C 881, two-component material suitable for use on dry or damp surfaces. Provide material "Type", "Grade" and "Class" to suit project requirements.

a. Apply as per manufacturer's recommendation.

E. Concrete Hardener:

1. Subject to compliance with requirements provide the product below as the basis for selection:

a.1 Transparent type:

Products used as basis for selection:

- a.1.1 ASHFORD FORMULA by Curecrete or equal.
- a.1.2 KURE-N-HARDEN by Degussa or equal.
- a.1.3 SIKAFLOOR – CUREHARD - 24 by Sika Phil., Inc.
- b.1 Provide where required in schedules.
- 2. Required performance warranty from the Applicator and Manufacturer of the concrete hardener shall be twenty (20) years from the date of substantial completion.
- F. Refer to Section 09705 for areas requiring epoxy floor coating.

## **2.02 TOPPING MIX**

### **A. Standard Topping:**

- 1. Design mix to produce topping material with the following characteristics:
  - a. Compressive strength of concrete protection course: 20684.16 kPa (3000 psi).

## **2.03 MIXING**

A. Provide a batch type mechanical mixer for mixing topping material at the project site. Equip a batch mixer with a suitable charging hopper, water storage tank, and a water-measuring device. Use only mixers which are capable of mixing aggregates, cement, and water into a uniform mix within specified time, and of discharging mix without segregation.

B. Mix each batch of 1.5 cubic meters (2 cu. yd.) or less for at least 1-1/2 minutes after ingredients are in the mixer. Increase mixing time (15 seconds ) for each additional cubic meter or fraction thereof.

## **PART 3 EXECUTION**

### **3.01 CONDITION OF SURFACES**

A. Topping Applied to Hardened Concrete: Remove dirt, loose material, oil, grease, paint or other contaminants, leaving a clean surface.

- When base slab surface is unacceptable for good bonding, roughen surface by chipping or scarifying before cleaning.

B. Prior to placing the topping mixture, thoroughly dampen the slab surface but do not leave standing water. Over a dampened surface, apply specified epoxy adhesive. Place topping mix while epoxy adhesive is still tacky.

C. For reinforced toppings, provide necessary chairs or supports, and maintain the position of reinforcing mesh as shown on drawings.

D. Joints: Mark locations of joints in base slab so that joints in top course will be placed directly over them.

### **3.02 PLACING & COMPACTING**

A. Float Finish: Spread topping mixture evenly over prepared base to the required elevation and strike off. Use highway straightedge, bull float, or darby to level the surface. After the topping has stiffened sufficiently to permit the operation, and water sheen has disappeared, float the surface at least twice to a uniform sandy texture. Re-straighten where necessary with highway straightedge. Uniformly slope surface to drains.

B. Where joints are required, construct to match and coincide with joints in the base slab. Provide other joints as shown.

### **3.03 TROWEL FINISH**

A. After floating, begin the first trowel finish operation using power driven trowels. Continue trowelling until the surface is ready to receive final trowelling. Begin final trowelling when a ringing sound is produced as the trowel is moved over surface.

B. Continue final trowel operation to produce finished surface free of trowel marks, uniform in texture and appearance.

### **3.04 CURING & PROTECTION**

A. General: Protect freshly placed topping from premature drying and excessive cold or hot temperatures.

B. Evaporation Retarder: Apply evaporation retarder to topping surfaces in hot, dry, or windy conditions before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying topping, but before float finishing.

C. Begin curing immediately after finishing topping. Cure by one or a combination of the following methods, according to topping manufacturer's written instructions:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with water. Cover topping surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during the curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in two coats in continuous operations by power spray or roller according to the manufacturer's written instructions. Re-coat areas subjected to

heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during the curing period.

### **3.05 PERFORMANCES**

A. Failure of concrete topping to bond to substrate (as evidenced by a hollow sound when tapped), or disintegration or other failure of topping to perform as a floor finish, will be considered failure of materials and workmanship. Repair or replace toppings in areas of such failure, as directed.

## **FIBER CEMENT BOARDS**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections apply to this Section.

#### **1.02 SUMMARY**

A. Provide fiber cement panels screw-attached to steel framing members for the following applications where required:

1. Interior walls and partitions, where indicated in schedules.
2. Bulkhead and cladding applications where indicated in schedules.
3. Undersides and soffits, where intended for the project.
4. Interior back-of-the-house ceiling applications, if intended for the project.
3. Other indicated applications on drawings and schedules, and where required or directed by the Architect.

B. Related Sections include the following:

- Section 09911. For painting requirements.

#### **1.03 SUBMITTALS**

A. Product data from manufacturers for each type of product specified.

B. 300mm x 300mm for the boards required, 2 pieces minimum and 300mm long furring channels, minimum 2 pieces each.

C. Shop drawings for each application indicated.

D. Mock-up samples of completed assembly, 600mm x 600mm, showing edge, joint and termination details.

#### **1.04 QUALITY ASSURANCE**

A. Single Source Responsibility: Obtain each type of board panels required and related treatment materials from a single manufacturer.

B. Structural and Wind Loading Requirements: Fiber cement panel assemblies shall comply and resist the required structural and wind loading requirements by the Project's Structural Design Engineer and Curtain Wall Consultant.

C. All panel assemblies shall be designed by a Professional Engineer allowed by the Philippine's Professional Regulatory Commission to practice locally, who shall sign and seal all shop drawing submittals.

D. All fiber cement boards shall be asbestos free and free from the following chemicals: chrysolite, crocidolite, amosite, tremolite, actinolite, and anthophyllite. Wright Flex fiber cement board brand is not an acceptable product for any intended fiber cement board applications for the Project.

#### **1.05 DELIVERY, STORAGE & HANDLING**

A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic and other causes. Neatly stack panels flat to prevent sagging.

C. Handle panels to prevent damage to edges, ends and surfaces. Do not bend or otherwise damage metal corner beads and trim.

### **PART 2 PRODUCTS**

#### **2.01 PANEL BOARDS REQUIRED**

A. Fiber Cement Sheets: Auto-claved, double-faced sheets containing Portland cement, ground sand, cellulose fiber and water. Asbestos free.

#### **2.02 MANUFACTURERS**

A. Subject to compliance with requirements, manufacturers offering products, which may be incorporated in the Work, include, but are not limited to, the following:

*FIBER CEMENT BOARDS*

1. James Hardie by Jardine Davies.
2. Shera by Shera Phils., Inc.
3. Other approved equal by the Architect.

**2.03 TRIM ACCESSORIES**

A. Trim Accessories: Provide metal trim accessories of profile and materials as shown on the drawings, and standard with the manufacturer of fiber cement board.

**2.04 MISCELLANEOUS FRAMINGS & SUPPORTS**

A. General: Provide steel framing and supports for applications indicated.

B. Fabricate units to sizes, shapes, and profiles indicated and required to receive adjacent other construction retained by framing and support. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.

- Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts, if units must be installed after concrete is placed.

**2.05 STEEL FRAMING FOR WALLS & PARTITIONS**

A. General: Provide steel framing system for walls and partition recommended or acceptable to gypsum board manufacturer. Products that cannot show proof that they are acceptable to the Gypsum board manufacturers are not acceptable.

B. Steel Studs and Runners (where indicated): ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 4.7625mm (3/16") minimum lip (return). Thickness: Ga.22; Depth as indicated or if not indicated as directed by the Architect as required for the project.

C. Steel Rigid Furring Channels: ASTM C 645, hat-shaped, thickness of base (uncoated) metal 0.0179 inch thick minimum; depth as indicated.

D. Furring Brackets: ASTM C 645.

E. Fasteners: Provide fasteners of type, material, size, corrosion resistance, holding power and other properties required to fasten steel furring members securely to substrates involved; complying with the recommendations of gypsum drywall manufacturers for applications indicated.

F Provide other steel framing profiles of sizes as required on drawings using cold-formed steel sections, of gages approved by the Structural Design Consultant.

## **2.06 STEEL FRAMING COMPONENTS FOR SUSPENDED & FURRED CEILING**

A. General: Provide components, which comply with ASTM C 754 for materials and sizes, unless otherwise indicated.

- Provide steel suspended system recommended or acceptable to the gypsum board manufacturer. Products that cannot show proof that they are acceptable to the fiber cement board manufacturers are not acceptable.

B. Drilled-In Expansion Anchors: Expansion anchors complying with FS FF-S-325, stud anchor type, DYNA bolt or equal, stainless steel or other non-corrosive material. With the capability to sustain, without failure, a load equal to 3 times that imposed by the ceiling construction, as determined from testing as per ASTM E 488.

C. Hanger Rods: Mild steel, galvanized finish, of size as recommended by the manufacturer, minimum 6 mm diameter, with capability to sustain without failure, a load equal to 3 times that imposed by the ceiling construction.

D. Turnbuckle: Galvanized finish.

E. Angle-Type Hangers: Angles with legs not less than 22.22mm (7/8 inch) wide, formed from 1.61mm (0.0635 inch) thick galvanized steel sheet.

F. Channels: Cold-rolled steel, 1.52 mm (0.0598 inch) minimum thickness of base (uncoated) metal.

- Carrying Channels: 30mm deep, 215.46 kilograms (475 lbs.) per 304.8 meters (1000 ft.), unless otherwise indicated.

G. Steel Rigid Furring Channel: ASTM C 645, hat shaped, depth of 21mm or as otherwise indicated, (0.0179 inch) .45mm thick minimum.

H. Provide other required framing of profiles and sizes as shown on drawings, in gauges approved by the Structural Design Consultant.

## **2.07 FIBER CEMENT PANELS**



A. General: Provide fiber cement panels of types indicated in maximum lengths available to minimize end-to-end joints.

B. Subject to compliance with requirements provide the following products used as basis for selection:

- Hardiflex Pro or equal by James Hardie for flushed joint applications.

a. Edges : Recessed (tapered).

b. Thickness Required:

b.1 9mm thick for interior walls and partitions.

b.2 6mm thick for interior bulkhead, cladding and ceiling applications.

b.3 Other thicknesses required to complete the fiber cement board work package.

## **2.08 FIBER CEMENT JOINT TREATMENT MATERIALS**

A. General: Provide materials complying with ASTM C 475, ASTM C 840 and recommendations of manufacturer for the application indicated.

B. Joint Tape: Paper-reinforcing tape, unless otherwise indicated.

C. Setting-Type Joint Compounds: Factory-prepackaged, job-mixed chemical hardening powder products formulated for uses indicated.

- Where setting-type joint compounds are indicated for use as taping and topping compounds, use formulation for each which develops greatest bond strength and crack resistance and is compatible with other joint compounds applied over it.

D. Drying-Type Joint Compounds: Factory-prepackaged vinyl-based products complying with the following requirements for formulation and intended use.

1. Ready-Mix Formulation: Factory-premixed product.

2. Taping compound formulated for embedding tape and for first coat over fasteners and flanges of corner beads and edge trim.

3. Topping compound formulated for fill (second and third) coats.

4. All purpose compound specifically formulated and manufactured for use as both taping and finishing compound, and compatible with tape, substrate and fasteners.

E. Provide and install joint treatment materials as recommended by the fiber cement board manufacturer.

## **2.08 MISCELLANEOUS MATERIALS**

A. General: Provide auxiliary materials for fiber cement board construction, which comply with reference standards and the recommendations of the manufacturer of the fiber cement board.

B. Fastening Adhesive for Metal: Special adhesive recommended by manufacturer.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

Examine substrates to which fiber cement board panel construction attaches or abuts, preset hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of fiber cement panel construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

A. General: Follow manufacturer's specifications.

B. Ceiling Anchorages: Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure that inserts and other structural anchorage provisions have been installed to receive anchors in a manner that will develop their full strength and at spacing required to support the ceiling.

- Furnish concrete inserts and other devices indicated to other trades for installation well in advance of time needed for coordination with other construction.

### **3.03 INSTALLATION OF STEEL FRAMING, GENERAL**

A. Steel Framing Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.

B. Install supplementary framing, blocking and bracing at termination in the work and for support of fixtures, equipment services, heavy trim, furnishings, and similar construction to comply with details indicated and with recommendations of gypsum board manufacturer, or if none available, with "Gypsum Construction Handbook" published by United States Gypsum Co.

C. Isolate steel framing from building structure to prevent transfer of loading imposed by structural movement, at locations indicated below to comply with details shown on drawings:

- Where edges of suspended ceilings abut building structure horizontally at ceiling perimeters or penetration of structural elements.

D. Do not bridge building expansion and control joints with steel framing or furring members; independently frame both sides of joints with framing or furring members or as indicated.

### **3.04 INSTALLATION OF STEEL FRAMING FOR SUSPENDED & FURRED CEILINGS**

A. Secure hangers to structural support by connecting directly to structure where possible otherwise connect to cast-in-concrete inserts or other anchorage devices or fasteners as indicated.

1. Do not attach hangers to the underside of concrete slabs with powder-actuated fasteners.

B. Do not connect or suspend steel framing from ducts, pipes or conduits.

C. Keep hangers and braces 50mm clear of ducts, pipes and conduits.

D. Sway brace suspended steel framing with hangers used for support.

E. Install suspended steel framing components in sizes and at spacing indicated but not less than that required by referenced steel framing installation standard.

1. Hanger Rods: 1. 22 m (4'-0") in the center, both ways.

2. Carrying Channels (Main Runners): 1.22 m (4'-0") on center.

3. Furring Channels (Furring Members): 406.4 mm (16") on center.

F. Installation Tolerances: Install steel framing components for suspended ceilings so that cross furring members of grid are level to within 3 mm in 3.70 m. as measured both lengthwise on each member and transversely between parallel members.

G. Clip furring members to main runners and to other structural supports as indicated.

### **3.06 APPLICATION AND FINISHING OF FIBER CEMENT PANELS, GENERAL:**

A. Apply and finish fiber cement panels as per manufacturer's specifications for flush-jointed applications, unless otherwise indicated .

B. Install fiber cement panels in a manner which minimizes the number of end-butt joints or avoids them entirely where possible.

C. Install exposed fiber cement panel with face side out. Do not install imperfect, damages or damp

boards. Butt boards together for alight contact at edges and ends with not more than 1.5mm open space between boards. Do not force it into place.

D. Locate either edge or end joints over supports, except in horizontal applications where intermediate support is provided behind end joints.

1. Provide expansion control joints of spacing as per manufacturer's recommendation. Provide sealed joints.
- E. Attach fiber cement panel to supplementary framing and blocking provided for additional support at openings and cutouts.
- F. Space fasteners in fiber cement panels in accordance with referenced application and finishing standard and manufacturer's specifications.

### **3.07 METHODS OF FIBER CEMENT PANEL APPLICATION**

- A. Install fiber cement boards in single layer, in lengths to minimize end joints. Install trims as indicated.

### **3.08 INSTALLATION OF TRIM ACCESSORIES**

- A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten fiber cement/calcium silicate board to the supports. Otherwise, fasten flanges to comply with manufacturer's specifications.

### **3.09 FINISHING OF FIBER CEMENT BOARD FOR UNDERSIDES AND BULKHEADS**

- A. General: Apply to joint treatment at fiber cement joints (both directions); penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration.
- B. Pre-fill open joints, using setting-type joint compound.
- C. Apply joint tape at joints between fiber cement boards unless otherwise required.
- D. Finish interior fiber cement board by applying the following joint compounds in 3 coats (not including pre-fill of openings in base), and sand between coats and after last coat:
  1. Embedding and First Coat: Setting-Type joint compound.
  2. Fill (Second) Coat: Ready-Mix drying-type all-purpose or topping compound.
  3. Finish (Third) Coat: Ready-Mix drying-type all purpose or topping compound.
- E. Refer to Section 09911 for Painting Requirements.

### **3.10 PROTECTION**

- A. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures, fiber cement panel construction being without damage or deterioration at time of Substantial Completion.

## **CONCRETE MASONRY UNIT**

### **PART 1 - GENERAL**

#### **1.01 SUMMARY:**

- A. Work Includes: This Section includes the furnishing and installation of concrete masonry units, reinforcing steel, miscellaneous masonry accessories and masonry cleaners.
- B. Related Sections:
  1. Section 04050, "Masonry Mortar and Grout"

2. Section 05500, "Metal Fabrications"
3. Section 06100, "Rough Carpentry"
4. Section 07200, "Building Insulation"
5. Section 07600, "Flashing and Sheet Metal"
6. Section 07900, "Joint Sealants"
7. Section 08110, "Steel Doors and Frames"
8. Section 09900, "Painting"

#### **1.02 REFERENCES:**

- A. American Concrete Institute (ACI)  
 315-92 Details and Detailing of Concrete Reinforcement  
 530/ASCE 5 Building Code Requirements for Masonry Structures  
 530.1/ASCE 6 Specifications for Masonry Structures
- B. American Society for Testing and Materials (ASTM)  
 A36 Specification for Structural Steel  
 A82-95A Specification for Steel Wire, Plain, for Concrete Reinforcement  
 A123 Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products  
 A153 Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware  
 A185-94 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement  
 A307-94 Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength  
 A366 Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality  
 A496-95a Specification for Steel Wire, Deformed, for Concrete Reinforcement  
 A497-95 Specification for Welded Wire Fabric, Deformed, for Concrete Reinforcement  
 A525 Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process  
 A615 Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement  
 C90-97 Specification for Load-Bearing Concrete Masonry Units  
 C140-96b Method of Sampling and Testing Concrete Masonry Units  
 C150-97 Specification for Portland Cement  
 C207 Specification for Hydrated Lime for Masonry Purposes  
 C780-96 Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry  
 C979 Specification for Pigments for Integrally Colored Concrete  
 C1019-89a Test Method of Sampling and Testing Grout  
 D226 Specification for Asphalt Saturated Organic Felt Used in Roofing and Waterproofing  
 D1056-97a Specification for Flexible Cellular Materials - Sponge or Expanded Rubber  
 D2000-96 Classification System for Rubber Products in Automotive Applications  
 D2287-96 Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds  
 E119 Method for Fire Tests of Building Construction and Materials  
 E447 Methods for Compressive Strength of Masonry Prisms

- C. Masonry Codes and Specifications
- D. National Concrete Masonry Association (NCMA)
- E. International Building Code (IBC): Chapter 21 Masonry

### **1.03 DEFINITIONS**

A. Parging: The process of applying a coat of cement mortar to the back of the facing material, the face of the backing material, the face of rough masonry, and the earth side of foundation and basement walls (sometimes referred to as pargeing).

### **1.04 SUBMITTALS**

A. Submit the following in accordance with conditions of Contract and Section 01330, "Submittal Procedures".

1. Product Data: Submit product data for each different concrete masonry unit, accessory, and other manufactured products indicated.
2. Shop drawings for fabrication, bending, and placement of concrete masonry reinforcing bars. Comply with ACI 315 showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.
3. Asbestos-free and lead-free certification for all masonry materials and accessories.
4. Concrete masonry unit samples, for initial selection purposes, in small-scale form showing full extent of colors and textures available for each different exposed masonry unit required.
5. Material certificates for the following, signed by manufacturer and Contractor certifying that each material complies with requirements.
  - a. Each different cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
  - b. Each material and grade indicated for reinforcing bars.
  - c. Each type and size of joint reinforcement.
  - d. Each type and size of anchors, ties, and metal accessories.

### **1.05 QUALITY ASSURANCE**

A. Fire Performance Characteristics: Where indicated on the drawings, provide materials and construction identical to those of assemblies whose fire resistance has been determined per ASTM E119 by Underwriter's Laboratories.

B. Single-Source Responsibility for Masonry Units: Obtain concrete masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each surface or visually related surfaces.

- C. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
- D. All masonry units shall be sound, free of cracks or other defects that may interfere with the proper placing of the unit or impair the strength of construction.
- E. Where units are to be used in exposed wall construction, the exposed masonry faces shall not show chips or cracks, or imperfections when viewed from a distance of not less than 20 feet (6.1 m) under diffused lighting.
- F. Use of damaged items is prohibited, except by specific written authorization of the Architect.
- G. Testing: Obtain a qualified independent testing laboratory to perform the following testing indicated for source and field quality control.
  - 1. Testing Frequency: Tests and evaluations listed in this article may be performed during construction for each 5000 sq. ft (465 m<sup>2</sup>) of wall area.
  - 2. Concrete Masonry Unit Tests: For each different concrete masonry unit indicated, units will be tested for strength, absorption, and moisture content per ASTM C140.
  - 3. Prism Test Method: For each type of wall construction indicated, masonry prisms will be tested per ASTM E447, Method B. Prepare one set of prisms for testing at 7 days and one set for testing at 28 days.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.
- C. Store cementitious materials off the ground, under cover, and in dry locations.
- D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided. Store different aggregates separately.
- E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.
- F. Protect reinforcement, ties, and metal accessories from permanent distortion and store them off the ground.

#### **1.07 PROJECT CONDITIONS**

- A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at the end of each day's work. Cover partially completed masonry when construction is not in progress. Extend cover a minimum of 24 inches (610 mm) down both sides and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that come in contact with such masonry.

1. Protect the base of walls from rain-splashed mud and mortar splatter by means of coverings spread on the ground and over the wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of windows and door frames, as well as similar products with painted and integral finishes from mortar droppings.

D. Cold-Weather Construction: Comply with the following when ambient temperature falls below 40o F (4.4o C).

1. General: Remove masonry damaged by freezing conditions. Do not lay masonry units having temperature below 20o F (-6.7o C). Remove visible ice on masonry units before the unit is laid.

2. Specific requirements for various temperature ranges are as follows:

- a. Aggregates and mixing water shall be heated to produce mortar and grout temperatures between 40o F (4.4o C) and 120o F(48.9o C) at the time of mixing.
- b. Maintain mortar temperature on mortar boards above freezing until used on masonry.
- c. When the ambient temperature is between 20o F (-6.7o C) and 25o F (-3.9o C), provide heat sources on both sides of walls under construction and install wind breaks when wind velocity exceeds 15 miles per hour (24 km per hour).
- d. When ambient temperature is below 20o F (-6.7o C), provide enclosures and heat sources to maintain the temperatures above 32o F (0o C) within the enclosure.

3. Protection

- a. When mean daily temperature is between 40o F (4.4o C) and 32o F (0o C), protect completed masonry from rain or snow by covering with weather-resistive membrane for 24 hours after construction.
- b. When mean daily temperature is between 32o F (0o C) and 25o F (-3.9o C), completely cover completed masonry with weather-resistive membrane for 24 hours after construction.
- c. When mean daily temperature is between 25o F (-3.9o C) and 20o F (-6.7o C), completely cover completed masonry with insulating blankets or equal protection for 24 hours after construction.
- d. When mean daily temperature is below 20o F (-6.7o C), maintain masonry temperature above 32o F (0o C) for 24 hours after construction by enclosure with supplementary heat, by electric heating blankets, by infrared heat lamps, or by other acceptable methods.

E. Hot-Weather Construction: Protect masonry construction from direct exposure to wind and sun when erected in ambient temperature of 90o F (32o C) or greater in the shade, with a relative humidity less than 50%.



1. Do not spread mortar beds more than 4 feet (1.2 m) ahead of masonry. Set masonry units within one minute of spreading mortar. Dampen, but do not saturate masonry units immediately before installation.
2. Mortar can be retempered with cool water only once to maintain consistency.
3. Protection: When the mean daily temperature exceeds 100o F (38o C) or exceeds 90o F (32o C) with a wind velocity greater than 8 mph, fog spray all newly constructed masonry until damp, at least three times a day until the masonry is three days old.

## **PART 2 - PRODUCTS**

### **2.01 CONCRETE MASONRY UNITS**

A. Non-Load-Bearing Concrete Masonry Units: ASTM C90, and as follows:

1. Unit Compressive Strength: Provide units with minimum average net area compressive strength of at least 350 psi.
2. Size: Provide manufacturer's standard units with nominal face dimensions of 8" wide x 8" high x 16" long (203 mm wide x 203 mm high x 406 mm long), actual dimensions 7-5/8" x 7-5/8" x 15-5/8" (194 mm x 194 mm x 397 mm), unless otherwise indicated.
3. Provide Type I, moisture-controlled units.
4. Weight Classification: Normal weight.

B. Provide special shapes where indicated and as follows:

1. For lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
2. Bullnose units for outside corners where indicated.
3. Square-edge units for outside corners, except where indicated as bullnose.

C. Exposed Faces: Where special finishes are indicated, provide units with the following:

1. Standard aggregate, split face or split face-fluted finish.
2. Standard aggregate, slump finish.
3. Scoria aggregate, smooth face, split face or split face-fluted finish.

### **2.02 REINFORCEMENT**

A. Steel Reinforcing Bars: ASTM A615, Grade 60.

B. Deformed Reinforcing Wire: ASTM A496.

C. Plain Welded Wire Fabric: ASTM A185.

D. Deformed Welded Wire Fabric: ASTM A497.

E. Joint Reinforcement: 9 gage deformed side rods and diagonal rods, in accordance with ASTM A951.

1. Galvanized in accordance with ASTM A641 for internal applications and ASTM A153 for external applications.

2. Description: Prefabricated truss type welded-wire units with deformed continuous side rods and diagonal rods, spaced no more than 16" O.C. into straight lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.

3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering joint reinforcement that may be incorporated in the work include.

### **2.03 TIES AND ANCHORS**

A. Galvanized Carbon Steel Wire: ASTM A82, hot-dip galvanized after fabrication to comply with ASTM A153, Class B2. Wire diameter 0.1875 inch (4.76 mm), unless otherwise indicated.

B. Galvanized Steel Sheet: ASTM A366 (commercial quality) cold-rolled carbon steel sheet hot-dip galvanized after fabrication to comply with ASTM A525, for sheet metal ties and anchors. Minimum thickness 0.0598 inch (16 gage) (1.52 mm), unless otherwise indicated.

C. Steel Plates and Bars: ASTM A36, hot-dip galvanized to comply with ASTM A123 or ASTM A153, Class B3, as applicable to size and form indicated.

D. Bent Wire Ties: Individual units prefabricated from bent wire to comply with requirements indicated below:

1. Tie Shape for Hollow Masonry Units Laid with Cells Vertical: Rectangular with closed ends and not less than 4 inches (102 mm) wide.

2. Tie Shape for Solid Masonry Unit Construction: Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches (51 mm) long.

E. Adjustable Anchors for Connecting Masonry to Structural Framework: Provide two-piece assemblies as described below allowing vertical or horizontal differential movement between wall and framework parallel to plane of wall, but resisting tension and compression forces perpendicular to it.

1. For anchorage to concrete framework, provide manufacturer's standard with dovetail anchor section formed from sheet metal and triangular-shaped wire tie section sized to extend within 1 inch (25 mm) of masonry face. Wire diameter 0.1875 inch (4.76 mm).

2. The anchorage to steel framework provides the manufacturer's standard anchors with crimped 1/4-inch (6.35 mm) diameter wire anchor section for welding to steel and triangular shaped wire tie section sized to extend within 1 inch (25 mm) of masonry face. Wire diameter 0.1875 inch (4.76 mm).

F. Rigid Anchors: Provide straps of form and length indicated, fabricated from metal strips of following width and thickness. 1. 1-1/2 inches (38.1 mm) wide by 1/4 inch (6.35 mm) thick, unless otherwise indicated.

G. Miscellaneous Anchors

1. Unit Type Masonry Inserts in Concrete: Cast iron or malleable iron inserts of type and size indicated.

2. Dovetail Slots: Furnish dovetail slots, with filler strips, of slot size indicated, fabricated from 0.0336-inch (22-gage) (0.8534 mm) sheet metal.
3. Anchor Bolts: Steel bolts complying with A307, Grade A; with ASTM A563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A153, Class C; of diameter, length and type indicated on the drawings.

H. Available Manufacturers: Subject to compliance with requirements, propose manufacturers offering products that may be incorporated in the work.

#### **2.04 MISCELLANEOUS MASONRY ACCESSORIES**

- A. Non Metallic Expansion Joint Strips: Premolded neoprene filler strips complying with ASTM D1056, Type 2 (closed cell), Class A (cellular rubber and rubber-like materials with specific resistance to petroleum base oils), Grade 1 (compression-deflection range of 2-5 psi (14 - 35 kPa)), compressible up to 35 percent, of width and thickness indicated.
- B. Preformed Control Joint Gaskets: styrene-butadiene rubber compound ASTM D2000, Designation 2AA-805., designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond Breaker Strips: Asphalt-saturated organic roofing felt complying with ASTM D226, Type I (No. 15 asphalt felt).
- D. Weep Holes: Medium-density round plastic polyethylene tubing, 3/8-inch (9.53 mm) outside diameter by 4 inches (102 mm) long.
- E. Waterproofing: Provide “Sikagard – 703 W” water repellent by Sika Philippines, Inc. on all exterior exposed CMU or paint according to requirements in Section 09900, “Painting”.

#### **2.05 MASONRY CLEANERS**

- A. Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2-cup or 118 mL dry measure) and laundry detergent (1/2-cup or 118 mL dry measure) dissolved in one gallon (3.78 L) of water.
- B. Job-Mixed Muriatic Solution: Solution of 1 part muriatic acid and 10 parts clean water, mixed in a nonmetallic container with acid added to water.
- C. Proprietary Acidic Cleaner: Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use by manufacturer of masonry units being cleaned.

1. For masonry not subject to metallic oxidation stains, use formulation consisting of a concentrated blend of surface-acting acids, chelating, and wetting agents.
2. For dark colored masonry not subject to metallic oxidation stains, use formulation consisting of a liquid blend of surface-acting acids and special inhibitors.
3. For masonry subject to metallic oxidation stains, use formulation consisting of a liquid blend of organic and inorganic acids and special inhibitors.
4. Available Products: Subject to compliance with requirements, propose a product that may be used to clean unit masonry surfaces.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine conditions for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of concrete masonry units.
- B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.
- C. Do not proceed until unsatisfactory conditions have been corrected.

#### **3.02 PREPARATION**

- A. Clean all reinforcement by removing mud, oil, or other materials that will adversely affect or reduce bond at the time mortar or grout is placed. Reinforcement with rust and/or mill scale will be accepted, provided the dimensions and weights, including heights of deformations, are not less than required by the ASTM specification covering this reinforcement in this Specification.
- B. Prior to placing masonry, remove laitance, loose aggregate, and anything else that would prevent mortar from bonding to the foundation.
- C. Do not wet concrete masonry prior to installation, unless otherwise indicated.

#### **3.03 INSTALLATION**

##### **A. General:**

1. Thickness: Build masonry construction to the full thickness shown, using units of nominal thickness indicated.
2. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.

3. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Use full size units without cutting where possible.
4. Matching Existing Masonry: Match coursing, bonding, color, and texture of new masonry with existing masonry.

**B. Masonry erection:**

1. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurately locating openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
2. Erect walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
3. Lay all exposed masonry in one-half running bond with vertical joint in each course centered on units in courses above and below, do not use units with less than nominal 4- inch (102 mm) horizontal face dimensions at corners or jambs.
4. Lay all concealed masonry with all units in running bond or bonded by lapping not less than 2 inches (51 mm). Bond and interlock each course at corners. Do not use units with less than nominal 4-inch (102 mm) horizontal face dimensions at corners or jambs.
5. Stopping and Resuming Work: In each course, rack back 1/2-unit length; do not tooth. Clean exposed surfaces of set masonry, and remove loose masonry units and mortar prior to laying fresh masonry.
6. Built-In Work: As construction progresses, build in items specified under this and other sections of the Specifications. Fill in solidly with masonry around built-in items.
  - a. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
  - b. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
  - c. Fill cores in hollow concrete masonry units with grout 3 courses under bearing plates, beams, lintels, posts, and similar items, or as otherwise indicated on the contract drawings.

**3.04 CONSTRUCTION TOLERANCES**

**A. Dimension of Elements**

1. In cross section or elevation ..... -1/4 in, +1/2 in. (-6.35 mm, + 12.7 mm)
2. Mortar joint thickness

bed ..... +1/8 in. (+ 3.18 mm)  
 head ..... -1/4 in., +3/8 in. (- 6.35 mm, + 9.53 mm)  
 collar ..... -1/4 in., +3/8 in. (-6.35 mm, + 9.53 mm)

Initial bed joints shall not be less than 1/4 inch (604 mm) or more than 1 inch (24 ..... mm).

3. Grout space or cavity width ..... -1/4 in., +3/8 in. (-6.35 mm, + 9.53 mm)

B. Elements

1. Variation from level:

bed joints ..... +1/4 in. in 10 ft.(+ 6.35 mm in 3.05 m)

..... +1/2 in. maximum (+ 12.7 mm)

top surface of bearing walls ..... +1/4 in. in 10 ft. (+ 6.35 mm in 3.05 m)

..... +1/2 in. maximum (+ 12.7 mm)

2. Variation from plumb ..... +1/4 in. in 10 ft.(+ 6.35 mm in 3.05 m)

..... +3/8 in. in 20 ft. (+ 9.53 mm in 6.1 m)

..... +1/2 in. maximum (+ 12.7 mm)

3. True to a line ..... +1/4 in. in 10 ft. (+ 6.35 mm in 3.05 m)

..... +3/8 in. in 20 ft. (+ 9.53 mm in 6.1 m)

..... +1/2 in. maximum (+ 12.7 mm)

4. Alignment of columns and walls (bottom versus top)

..... +1/4 in. for bearing walls (+ 6.35 mm)

..... +1/2 in. for nonbearing walls (+ 12.7 mm)

C. Location of Elements

1. Indicated in plan ..... +1/2 in. in 20 ft. (+ 12.7 mm in 6.1 m)

..... +3/4 in. maximum (+ 19.1 mm)

2. Indicated in elevation ..... +1/4 in. in story height (+ 6.35 mm)  
 ..... +3/4 in. maximum (+ 19.1 mm)

### 3.05 PLACING MORTAR AND UNITS

A. Hollow concrete units:

1. Face shells of bed joints fully mortared.
2. Webs are fully mortared in all courses of piers, columns, and pilasters, in the starting course on foundations, when necessary to confine grout or loose-fill insulation, and when otherwise required.
3. For starting courses on footings where cells are not grouted, spread out a full mortar bed including areas under cells.

B. Cut joints flush for masonry walls to be concealed or to be covered by other materials, unless otherwise indicated.

### 3.06 REINFORCEMENT INSTALLATION

A. Place reinforcement in accordance with the sizes, types, and locations indicated on the contract drawings. Horizontal reinforcement may be placed as the masonry work progresses.

B. Reinforcement shall be secured against displacement prior to grouting by wire positioners or other suitable devices such as wire tying, at intervals not exceeding 200 bar diameters.

C. Tolerances: Placement of reinforcement in walls and flexural elements shall be: 1. + 1/2 inch (13 mm) when the distance from the centerline of steel to the opposite face of masonry,  $d$ , is equal to 8 inches (203 mm) or less

2. + 1 inch (25 mm) for  $d$  equal to 24 inches (600 mm) or less but greater than 8 inches (203 mm)

3. + 1-1/4 inch (32 mm) for  $d$  greater than 24 inches (600 mm).

4. + 2 inches for longitudinal location of reinforcement.

D. Clearance between reinforcing steel and the surface of the masonry shall be not less than 1/4 inch (6.4 mm) for fine grout and 1/2 inch (12.7 mm) for coarse grout.

E. Do not bend reinforcement after it is embedded in grout or mortar, unless directed by the SDR.

F. Horizontal Joint Reinforcement: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch (15.9 mm) on the exterior side of walls, 1/2 inch (12.7 mm) elsewhere. Lap reinforcing a minimum of 6 inches (152 mm).

1. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated for structural considerations.

2. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

### **3.07 ANCHORING MASONRY TO STRUCTURAL MEMBERS**

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch (25 mm) in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (914 mm) o.c. horizontally, unless otherwise indicated on the contract drawings.

### **3.08 ANCHORING SINGLE-WYTHER MASONRY VENEER**

A. Anchor single-wythe masonry veneer to metal studs with masonry veneer anchors to comply with the following requirements:

1. Fasten each anchor section through sheathing to metal studs with 2 metal fasteners of type indicated.
2. Embed tie section in masonry joints. Provide not less than 2-inch (51-mm) air space between back of masonry veneer wythe and face of sheathing.
3. Locate anchor section relative to course in which tie section is embedded to allow maximum vertical differential movement of tie up and down.
4. Space anchors as indicated on the contract drawings, but not more than 18 inches (457 mm) o.c. vertically and 24 inches (610 mm) o.c. horizontally with not less than one anchor for each 2 sq. ft (0.19 sq. m) of wall area. Install additional anchors within 1'-0" (305 mm) of openings and at intervals around perimeter not exceeding 8 inches (203 mm).

B. Install vents at the top of each continuous air space in masonry veneer walls.

### **3.09 MOVEMENT (CONTROL AND EXPANSION) JOINTS**

A. Install control and expansion joints in masonry units where indicated. Build in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. If location of control joints is not indicated on the contract drawings, place vertical joints spaced not more than 30 feet (9.1 m) o.c. Locate control joints at points of natural weakness in masonry work.

C. Form control joints in concrete masonry as follows:

1. Fit bond breaker strips into hollow contour in ends of block units on one side of the control joint. Fill the resultant core with grout and rake joints in exposed faces.
2. Install preformed control joint gaskets designed to fit standard sash block.



3. Install special shapes designed for control joints. Install bond breaker strips at joints. Keep head joints free and clear of mortar or rake joints.

D. Build in horizontal pressure-relieving joints where indicated; construct joints by either leaving

an air space or inserting nonmetallic 50 percent compressible joint filler of width required to permit installation of sealant and backer rod specified in Section 07900 "Joint Sealants."

E. Locate horizontal pressure-relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

### **3.10 LINTELS**

A. Install steel lintels where indicated.

B. Provide masonry lintels where shown and wherever openings of more than 2'-0" (610 mm) for block size units are shown without structural steel or other supporting lintels. Provide precast or formed-in-place masonry lintels. Cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.

C. For hollow concrete masonry unit walls, use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout.

D. Provide minimum bearing of 8 inches (203 mm) at each jamb, unless otherwise indicated.

### **3.11 WEEP HOLES**

A. Install weep holes in the head joints of the first course of masonry immediately above embedded flashings and as follows:

1. Form weep holes with products specified in Part 2 of this Section.

2. Space weep holes 24 inches (610 mm) o.c., unless otherwise indicated.

### **3.12 INSTALLATION AND GROUTING OF REINFORCED MASONRY UNIT**

A. Temporary Formwork: Construct formwork and shores to support reinforced masonry elements during construction.

B. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

C. Do not place grout until the entire height of masonry to be grouted has attained sufficient strength to resist displacement of masonry units and breaking of mortar bond.

D. All cells and spaces containing reinforcement shall be filled with grout.

E. Prior to grouting, grout space shall be cleaned so that all spaces to be filled with grout do not contain mortar drippings, debris, loose aggregates, and any material deleterious to masonry grout.

F. Place reinforcement and ties in grout spaces prior to grouting. Bolts shall be accurately set and

held in place to prevent dislocation during grouting.

G. Grouting of any section of wall shall be completed in one day with no interruption greater than one hour.

H. Cleanouts: Provide cleanouts in the bottom course of masonry for each grout pour, when the grout pour height exceeds 5 feet (1.5 m).

1. Provide cleanouts adjacent to each vertical bar.
2. In solid grouted masonry, space cleanouts horizontally a maximum of 32 inches (813 mm) o.c.
3. Construct cleanouts with an opening of sufficient size to permit removal of debris. Minimum opening dimension shall be 3 inches (76 mm).
4. Cleanouts shall be sealed after inspection and before grouting.

I. Place grout within 1 1/2 hour from introducing water in the mixture and prior to initial set.

J. Grout Lift Height: Place grout in lifts not exceeding 5 feet (1.5 m).

K. Consolidation: Consolidate grout at the time of placement.

1. Consolidate grout pours 12 inches (305 mm) or less in height by mechanical vibration or by puddling.
2. Consolidate pours exceeding 12 inches (305 mm) in height by mechanical vibration and reconsolidate by mechanical vibration after initial water loss and settlement has occurred.

### **3.13 PARGING**

A. Large pre dampened masonry walls where indicated with Type S or N mortar applied in two uniform coats to a total thickness of 3/4 inch (19.05 mm). Scarify first parging coat to ensure full bond to subsequent coats.

B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot (3.175 mm per m). Form a wash at top of parging and a cove at bottom.

C. Damp cure parging for at least 24 hours and protect until cured.

### **3.14 REPAIRING, POINTING, AND CLEANING**

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.

C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Protect adjacent stone and non masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
3. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
4. Leave the work area and surrounding surfaces clean and free of mortar, spots, droppings and broken masonry. Remove defective or broken work and install new work.

D. Waterproofing: After completion of final cleaning, apply waterproofing according to the manufacturer's installation instructions ensuring that all exposed masonry surfaces receive full coverage.

## **METAL FABRICATIONS**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and

Division-1 Specification Sections apply to this Section.

#### **1.02 SUMMARY**

A. This Section includes the following metal fabrications:

1. Rough hardware.
2. Rungs and ladder.
3. Heavy duty metal bar gratings.
4. Steel framed stairs, angles, channels, closures and trims (If intended for the project)
5. Railings and handrails.
6. Structural steel columns and supports. (By structural consultant)
7. Leveling plates.
8. Steel louver screens at the building façade.
9. Perimeter fences and gates (if intended for the project)
10. Stainless steel cat ladder (if intended for the project.)
11. Welded wire fabric espalier for vine/creepers (if intended for future landscaped areas)
12. Miscellaneous framing and support.
13. Miscellaneous steel trims, support members, plates, angles, channels and closures.
14. Maintenance hooks as for the required building cleaning provisions.
15. Grille doors with steel frames, where intended for LPG Storage and Cash Vault.
16. FE stair nosing.
17. Loading dock edge angle.
18. Other metal fabrication work as shown on drawings and by provision of this specifications section.

B. Related Sections include the following:

1. Section 09911. Painting.

#### **1.03 PERFORMANCE REQUIREMENTS**

A. General: In engineering handrails and railings to withstand structural loads indicated, determine

allowable design working stresses of materials based on the following

1. Aluminum: AA 30, "Specifications for Aluminum Structures."

2. Stainless Steel: ASCE 8, "Specification for the Design of Cold-Formed Stainless Steel Structural Members."
  3. Cold-Formed Structural Steel: AISI SG-673, Part I, "Specification for the Design of Cold-Formed Steel Structural Members."
  4. Structural Steel: AISC S335, "Specification for Structural Steel Buildings Allowable Stress Design and Plastic Design with Commentary."
- B. Structural Performance: Fabricate, and install the following metal fabrications to withstand the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each respective component of each metal fabrication.
1. Top Rail of Stair Railings and other Guardrail System: Capable of withstanding the following loads applied as indicated.
    - a. Concentrated load of 136 kg (300 lb-f) applied at any point at the top of the rail vertically downward, or horizontally.
    - b. Uniform load of 45.36 kg (100 lb-f) per linear ft. applied non-concurrently, vertically downward or horizontally.
    - c. Concentrated and uniform loads above need not be assumed to act concurrently.
  2. Handrails Not Serving as Top Rails: Capable of withstanding the following loads applied as indicated:
    - a. Concentrated load of 27.66 m-kg (200 lb-f) applied at any point non-concurrently, vertically downward or horizontally.
    - b. Uniform load of 6.915 m-kg (50 lb-f per linear feet ) per one third of a linear meter applied non-concurrently, vertically downward or horizontally.
    - c. Concentrated and uniform loads above need not be assumed to act concurrently.
  3. Infill Area of Stair Railings and Other Guardrail Systems: Capable of withstanding a horizontal concentrated load of 12.55 m-kg (200 lb-f) applied to .3048 sq. meter any point in the system including panels, intermediate rails balusters, or other elements composing the infill area.
    - a. Above load need not be assumed to act concurrently with uniform horizontal loads on top rails of railing systems in determining stress on guard
  4. Heavy Duty Metal Bar Gratings: Capable of withstanding a uniform load of 35.58 m-kg (250 lb-f) per .3048 sq. m. or a concentrated load of 1106.4 m-kg (8000 lbf) whichever produces greater stress. Use at Driveways, ramps, parking areas and other areas where intended for the project.
- C. Thermal Movements: Provide handrails and railings that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces

D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials

#### **1.04 SUBMITTALS**

A. Product Data for products used in miscellaneous metal fabrications, including paint products and grout.

B. Shop drawings detailing fabrication and erection of each metal fabrication indicated. Include

plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections.

1. Where installed metal fabrications are indicated to comply with certain design loading, including structural computations, material properties, and other formation needed for structural analysis that has been signed and sealed by the qualified professional engineer who was responsible for their preparation.

C. Samples for Initial Selection: Short sections of railing or flat sheet metal samples showing available mechanical finishes

D. Samples for Verification: For each type of exposed finish required, prepared on components indicated below and of the same thickness and metal indicated for the Work. If finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.

1. 6-inch- (150-mm-) long sections of each different linear railing member, including handrails,

top rails, posts, and balusters

2. Fittings and brackets

3. Welded connections

4. Brazed connections

5. Assembled Samples of railings, made from full-size components, including top rail, post, handrail, and infill. Show method of finishing members at intersections. Samples need not be full height

D. Welder certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" article.

E. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project name, addresses, names of Architects and Owners, and other information specified.

#### **1.05 QUALITY ASSURANCE**

A. Fabricator Qualifications: Firm experienced in successfully producing metal fabrications similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the work.

B. Installer Qualifications: Arrange for installation of metal fabrications specified in this section by the same firm that fabricated them.

C. Quality welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code-Steel" D1.3 "Structural Welding Code - Sheet Steel", and D1.2 "Structural Welding Code - Aluminum."

1. Certify that each welder has satisfactorily passed AWS qualifications tests for welding processes involved and, if pertinent, has undergone re-certification.

D. Engineer Qualifications: Professional engineer licensed to practice in a jurisdiction where the project is located and experienced in providing engineering services of the kind indicated that have resulted in the successful installation of metal fabrications similar in material, design, and extent to that indicated for this Project.

E. Mockups: Before installing handrails and railings, build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the completed Work

1. Build mockups in the location indicated or, if not indicated, as directed by Architect

2. Notify Architect seven days in advance of dates and times when mockups will be constructed

3. Obtain Architect's approval of mockups before fabricating ornamental handrails and railings

4. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work

5. Demolish and remove mockups when directed

6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion

F. Blast-clean steel painting to BS 4232 second quality with 95% of the surface clean bare steel, unless otherwise specified. The maximum amplitude of the blast cleaned surface shall not exceed 0.1mm. Clean the blasted surface by vacuum and do not touch the surface by hand or contaminate it in any other way. Apply the protective coating within 2 hours to the cleaned surface. Submit a sample of blast cleaned steel not less than 150 x 150 x 6mm adequately protected in sealed clean polythene wrapping for approval before any work is carried out. This approved sample will be retained for comparison with the subsequent prepared steelwork

## **1.06 STORAGE**

A. Store handrails and railings in a dry, well-ventilated, weather tight place.

## **1.07 PROJECT CONDITIONS**

A. On Site Measurements: Check actual locations of walls and other construction to which metal

fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

A. Sequence and coordinate installation of wall handrails as follows:

1. Mount handrails only on completed walls. Do not support handrails temporarily by any means not satisfying structural performance requirements.

### **1.09 DEMONSTRATION**

1. Factory visit by the Architect and the Owner's Representative shall be required for demonstration of steel surface preparation and hot dip galvanizing process complying with BS 729 and Sa21/8 in Swedish Standard SIS 05 59 00.

2. Factory visit by the Architect and the Owner's Representative shall be required for demonstration of steel and aluminum surface preparation and powder coating application complying with D3451-01 Standard Guide for Testing Coating Powders and Powder Coatings

3. All cost and time implications incurred by this demonstration shall be borne by the Contractor

### **1.10 WARRANTY FOR ALL THE REQUIRED HOT DIP GALVANIZED STEEL MEMBERS AT EXTERIOR**

A. Metal fabricator to give a five (5) year minimum warranty against rusts, corrosion and any other form and concentration of metal deterioration for all the required hot dip galvanized steel members and sections required for all exterior applications.

## **PART 2 PRODUCTS**

### **2.01 METALS**

A. Metals, General: Provide metal free from pitting, seam marks, roller marks, stains, discolorations, and other imperfections where exposed to view on finished units

B. Metal Surfaces, General: For metal fabrications exposed to view upon completion of the Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.

C. Steel Plates, Shapes, and Bars: ASTM A 36.

D. Rolled Steel floor Plates: ASTM A 786.

E. Steel Bars for Gratings: ASTM A 569 or ASTM A 36.

F. Wire Rod for Gratings Cross Bars: ASTM A 510.

G. Steel Tubing: Product Type (manufacturing method) and as follows:

1. Cold-Formed Steel Tubing: ASTM A 500, grade as indicated below:

a. Grade A, unless otherwise indicated or required for design loading.

H. Uncoated Structural Steel Sheet: Product type (manufacturing method), quality, and grade,

as follows:

1. Cold-Rolled Structural Steel Sheet: ASTM A 611, grade as follows:
  - a. Grade A, unless otherwise indicated or required by design loading.
- I. Uncoated Steel Sheet: Commercial quality, product type (method of manufacture) as follows:
  1. Cold-Rolled Steel Sheet: ASTM A 366.
- J. Galvanized Steel Sheet: Quality as follows:
  1. Structural Quality: ASTM A 446; Grade A, unless another grade required for design loading, and G90 coating designation unless otherwise indicated.
- K. Steel Pipe: ASTM A 53; finish, type and weight class as follows:
  1. Galvanized finish for exterior installations and where directed by the Architect.
  2. Type F, schedule 40, unless otherwise indicated, or another weight, type, and grade required by structural loads.
- L. Malleable Iron Castings: ASTM A 47, grade 32510.
- M. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
- N. Concrete Inserts: Threaded or wedge type, galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A 153.
- O. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for the metal alloy to be welded.
- P. Wrought Iron: shall conform to ASTM designation A-41.
- Q. Gray Iron Castings: ASTM A 48, Class 30.

## **2.02 STAINLESS STEEL**

- A. Bar Stock: ASTM A 276, Type 302.
- B. Plate: ASTM A 167, Type 302.
- C. Pipe: ASTM A 312, Grade TP 316.
- D. Castings: ASTM A 743, Grade CF 8 or CF 20.
- E. Tubing: ASTM A 554, Grades MT 301, MT 302 or MT304.

## **2.03 ALUMINUM**

- A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.
  1. Extruded Bar and Shapes: ASTM B 221, 6063-T6.
  2. Extruded Pipe and Tube: ASTM B 429, 6063-T6.
  3. Drawn Seamless Tube: ASTM B 483, 6063-T832.
  4. Plate and Sheet: ASTM B 209, 6061-T6.
  5. Die and Hand Forgings: ASTM B 247, 6061-T6.
  6. Castings: ASTM B 26, 356.0-T6.
  7. Minimum Thickness:
    - a. Plates: 3mm.



b. Extrusions: 3mm.

## **2.04 GROUT AND ANCHORING CEMENT**

A. Non-shrink Non Metallic Grout: Premixed, factory- packaged, non-staining, non-corrosive, nongaseous grout complying with CE CRD-C621. Provide grout specifically recommended by the manufacturer for interior and exterior applications of type specified in this section.

B. Erosion Resistant Anchoring Cement: Factory pre-packed, non-shrink, non-staining, hydraulic controlled expansion cement formulation for mixing with water at project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without need for protection by a sealer or waterproof coating and is recommended for exterior use by the manufacturer.

C. Products: Subject to compliance with requirements, provide one of the following:

1. Non-shrink Non Metallic Grouts:

a. "Bonsai Construction Grout"; W.R. Bonsai Co.

b. "Diamond-Crete Grout"; Concrete Service.

c. "Euco N-S Grout"; Euclid Chemical Co.

d. "Kemset"; Chem-Masters Corp.

e. "Crystex"; L & M Construction Chemicals, Inc.

f. "Masterflow 713"; Master Builders.

g. "Sealtight 588 Grout"; W.R. Meadows, Inc.

h. "SonogROUT"; Sonneborn Building Products Div., Rexnord Chemical Products, Inc

i. "Stonecrete NM1"; Stonhard, Inc.

j. "Five Star Grout"; US Grout Corp.

k. "Vibropruf #11"; Labert Corp.

l. Sika Grout 212/215, Sika Phils., Inc.

3. Erosion Resistant Anchoring Cement:

a. Super Pork-Rok; Minwax Construction Products Division, or other Architect approved.

## **2.05 FASTENERS**

A. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.

B. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.

C. Lag Bolts: Square head type, FS FF-B-561.

D. Machine Screws: Cadmium plated steel, FS FF-S-92.

E. Wood Screws: Flat head carbon steel, FS FF-S-111.

F. Plain Washers: Round, carbon steel, FS FF-W-92.

G. Drilled in Expansion Anchors: Expansion anchors complying with FS FF-S-325, Group VIII {anchors, expansion, non-drilling , Type I (internally threaded tubular expansion anchor ) }; and machine bolts complying with FS FF-B-575, Grade 5.

H. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class, and style as required.

I. Lock Washers: Helical spring type carbon steel, FS FF- W-84.

## **2.06 PAINT**

A. Shop Primer for Ferrous Metal: Manufacturer's or fabricator's standard, fast-curing, lead-free, universal modified alkyd primer selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated, and for capability to provide a sound foundation for field- applied topcoats despite prolonged exposure complying with performance requirements of FS TT-P-645.

B. Shop Primer for Galvanized Steel: Zinc-dust, zinc-oxide primer formulated for priming zinc-coated steel and for compatibility with finish paint systems indicated, and complying with SSPC-Paint 5.

C. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

## **2.07 CONCRETE FILL AND REINFORCING MATERIALS**

A. Concrete Materials and Properties: Comply with requirements of Division-3 Section "CONCRETE WORK" for normal weight, concrete with minimum 28-day compressive strength of 20,684.16 kPa (3,000 psi.) and W/C ratio of 0.65 maximum, unless higher strengths indicated.

B. Reinforcing Bars: ASTM A615, Grade 60 unless otherwise indicated.

## **2.08 FABRICATION GENERAL**

A. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use the type of materials indicated or specified for various components of each metal fabrication.

B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

C. Shear and punch metals cleanly and accurately. Remove burrs.

D. Ease exposed edges to a radius of approximately 0.794 mm (1/32 inch), unless otherwise indicated. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing work.

E. Remove sharp or rough areas on exposed traffic surfaces.

F. Weld corners and seams continuously to comply with AWS recommendations and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.
- G. Form exposed connections with hairline joints, flush and smooth using concealed fasteners wherever possible. Use exposed fasteners of type indicated or if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- H. Provide for anchorage of type indicated, coordinate with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
- I. Shop Assembly: Pre-assemble items in the shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for re-assembly and coordinated installation.
- J. Cut, reinforce drill and tap miscellaneous metal work as indicated to receive finished hardware, screws, and similar items.
- K. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

## **2.09 ROUGH HARDWARE**

- A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and Other rough hardware items are specified in Division 6 sections.
- B. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections: elsewhere furnish steel washers.

## **2.10 RUNGS AND LADDER**

- A. General: Fabricate rungs and ladders for the locations shown and where directed by the Architect, with dimensions, spacing, details and anchorages as indicated on drawings and where required for the project.
- B. Stainless Steel Rungs: Provide inside concrete water tanks and other areas where required on drawings and or directed by the Architect.
- a. Sizes of rungs shall be as indicated on drawings or if not indicated shall be as directed by the Architect,
- C. Hot-dip Galvanized Steel Rungs: Provide for elevator pits and other interior applications where required for the Project and where directed by the Architect. Finish to be full gloss enamel paint finish over epoxy primer, unless otherwise directed by the Architect to be unfinished.
- a. Sizes of rungs shall be as indicated on drawings or if not indicated shall be as directed by the Architect,

b. Where stiles are required, sizes shall be as indicated on drawings or if not indicated as directed by the Architect.

## **2.11 HEAVY DUTY METAL BAR GRATINGS**

A. Fabricate metal bar gratings to sizes, shapes, and profiles indicated and required to receive adjacent other construction retained by framing and supports. Fabricate from hot-dip galvanized structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.

1. Subject to compliance with requirements provide products by one of the following Manufacturers:

- a. Webforge.
- b. Ishida Philippines Grating Co., Inc.
- c. Other approved equivalents by the Architect.

2. Product used as basis: "Webgrate Medium Duty"; Webforge or other Webforge standard product series to comply with the Architects design intent. Architects intended design to govern over the manufacturer's standard product or this spec section.

B. Fabricate typical metal gratings to withstand a live load of 732.3-kg/square meter (150 lb./square ft.) for gratings that will not be subjected to vehicular or equipment loading.

C. Fabricate removable grating sections with banding bars attached by welding to the entire perimeter of each section. Include anchors and fasteners of type indicated, or if not indicated, as recommended by manufacturer, for attachment to supports.

D. Provide hinged gratings where indicated and or directed by the Architect.

E. Fabricate cutouts in grating sections for penetrations indicated. Arrange layout of cutouts to permit grating removal without disturbing items penetrating gratings.

F. Provide acrylic coating over epoxy primer if required and directed by the Architect.

1. Gratings exposed to sun and weather:

- a. Primer : Epoxy primer
  - b. Finish coating : Acrylic water-based epoxy paint, Boysen Aqua epoxy or equal.
2. Gratings at interior and not exposed to sun and weather.

a. Primer : Epoxy primer.

b. Finish coating : Epoxy enamel paint, Boysen epoxy enamel or equal.

G. Refer to details for the required design, member sizes, framing and support. Provide in gauge and sizes able to carry design loads but not diverting from the Architect's design intent. Finish and materials shall be as indicated on drawings.

H. Location: Driveways, trench drains, drop off areas and other area applications directed by the Architect and or where shown on drawings and where required for the project.

## **2.12 STEEL FRAMED STAIRS, if required for back of the house applications:**

A. General: Construct stairs to conform to sizes and arrangements indicated. Join pieces together by welding, unless otherwise indicated. Provide complete stair assemblies, including metal framing, hangers, columns, railings, newels, balusters, struts, clips, brackets, bearing

plates, and other components necessary for the support of stairs and platforms, and as required to anchor and contain the stairs on the supporting structure.

A. Stair Framing: Fabricate stringers of structural steel channels, or plates, or a combination thereof, as indicated. Provide closures for exposed ends of stringers. Construct platforms of structural steel channel headers and miscellaneous framing members as indicated. Bolt or weld headers to strings, newels, and framing members to strings and headers; fabricate and join so that bolts, if used, do not appear on finish surfaces.

B. Steel Stairs & Landings:

1. Fabricate landings and treads from plain steel floor plate unless otherwise required to be checkered steel plate, 6mm thick.

2. Sizes and profiles of intermediate steel rails and posts shall be as indicated on drawings, or if not indicated as directed by the Architect.

3. Provide automotive lacquer paint finish for all metal frames required; semi-gloss. Color as intended to follow Architects design. Provide paint type unless otherwise directed by the Architect.

## **2.13 RAILINGS AND HANDRAILS**

A. General: Fabricate railings and handrails to comply with requirements indicated for materials, design, dimensions, details, finish, and member sizes, including wall thickness of pipe, post spacings, and anchorage, but not less than that required to support structural loads.

1. All indicated dimensions of required sections and pipes are intended as the outside nominal dimension (O.D).

B. Assemble handrails and railings in the shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Interconnect railing and handrail members by butt- welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.

2. At tee and cross intersections, notch ends of intersecting members fit the contour of the pipe to which end is joined and weld all around.

3. For steel handrails, railings, and fittings, use plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.

D. Form changes in direction of railing members as follows where indicated:

1. By bending.

E. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.

F. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated.

G. Close exposed ends of pipe by welding 4.7625 mm (3/16 inch ) thick steel plate in place or by

use of prefabricated fittings, except where clearance of end of pipe and adjoining wall surface is 6.35 mm (1/4 inch) or less.

H. Brackets, Flanges, fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.

1. For railing post set in concrete, unless otherwise required fabricate sleeves from steel pipe not less than 152.4 mm (6 inches) long and with an inside diameter not less than 12.7 mm (1/2 inch) greater than the outside diameter of the post, with steel plate closure welded to the bottom of the sleeve.

2. Provide friction fit, removable covers designed to keep sleeves clean and hold top edge of sleeve 12.7 mm (1/2 inch) below finished surface of concrete.

3. Wall Brackets: Provide fabricated profile with size as indicated on drawings or if not indicated as directed by the Architect.

I. Fillers: Provide steel sheet or plate fillers of thickness and size indicated or required to support structural loads of handrails where needed to transfer wall bracket loads through wall finishes to

structural supports. Size fillers to suit wall finish thicknesses. Size fillers to produce adequate bearing to prevent bracket rotation and overstressing of substrate.

J. Where indicated on drawings, form pipe railings from black iron (B.I) pipe, fittings, fasteners,

sleeves, and other ferrous components. Provide in either Schedule 40 or 20 B.I pipes where required by the Structural Consultant and or as required to carry design loads.

K. Steel Handrails and Guardrails: Cope joints at pipe intersections, continuously weld interfaces and grind smooth to match adjacent surfaces. Provide 14 gauge galvanized sleeve larger than outside diameter of railing stanchions, embedded and flushed with concrete. Set stanchions in sleeves and grout in place. Embed assemblies after fabrication.

L. All required railings and posts shall be fabricated from hot dip galvanized steel sections of sizes, profile, design and dimensions as indicated on drawings, able to carry design loads.

M. Unless otherwise required, intermediate railing members shall be from Schedule 20; Posts and other vertical railing members shall be from Schedule 40 or as required by the Structural Consultant to carry design loads.

1. Finish shall be automotive lacquer paint, in color as directed by the Architect.

N. All handrail applications shall be fabricated from stainless steel sections, profile and dimensions indicated on drawings, able to carry design loads. Finish of stainless steel shall be as directed by the Architect or as indicated on drawings.

## **2.14 STRUCTURAL STEEL COLUMNS**

A. Fabricate steel columns to comply with requirements indicated for design, dimensions, details, finish, and sizes specified by the structural consultant.

B. Provide with automotive lacquer paint finish in color as directed by the Architect Provide unless otherwise required.

### **2.15 NOSINGS**

A. As may be required for the project, provide plain or checkered steel plate nosing bent to 25mm x 25mm x 3mm angle; with 10mm diameter dowels at 600mm maximum spacing, welded to nearest reinforcement.

### **2.16 LOADING DOCK EDGE ANGLE**

A. Fabricate loading dock edge angle to sizes, shapes, and profiles indicated. Fabricate from hot-dip galvanized checkered steel plates. Provide mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items. Provide anchors welded to angle for embedding in concrete loading dock edge, spaced not more than 150 mm from ends and 600 mm on center unless otherwise indicated on drawings.

- Use 75mm x 75mm x 6mm. Provide unless otherwise indicated on drawings and or directed by the Architect

### **2.17 LEVELING PLATES**

A. Provide leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Hot-dip galvanized after fabrication

B. Provide where required for residential buildings, drop-off structures and areas where required.

### **2.18 PERIMETER GATES AND FENCES**

A. Fabricate perimeter gates and fences to materials sizes, shapes, and profiles indicated and required to receive adjacent other construction retained by framing and supports. Unless otherwise required fabricate from galvanized steel sections, shapes, plates, and bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive heavy-duty hardware, anchors and similar items

B. Provide inserts and other anchorage devices for connecting fences and gates to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by fences and gates. Coordinate anchorage devices with supporting structure. Install with non-corrosive anchors.

C. Finish shall be automotive lacquer paint unless otherwise intended for the Project and or directed by the Architect. Color as required. Refer to Section 09911 for paint requirements.

### **2.19 WELDED WIRE FABRIC ESPALIER, if required for future landscaped areas:**

A. Unless otherwise required, fabricate and install espalier for vine/creepers from welded wire fabric, 100mm x 100 x 5.5mm in size.

B. Hanger supports shall be 6mm diameter solid steel section, unless otherwise required to carry design loads.

- C. Hangers and welded wire fabric shall be bare and unfinished, unless otherwise required to be painted.
- D. Provide stainless steel hooks and tie wire as required to comply with aesthetic and structural intent of the Architect.

## **2.20 STEEL LOUVER SCREENS AT BUILDING FACADE**

A. Fabricate steel louver screens to design, dimensions and details shown on drawings and details. Thickness of members shall be as required by the Structural Consultant or as indicated on drawings, able to carry design loads

B. Shop Assembly: Pre-assemble items in the shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.

C. Welded Connections: Fabricate louver screen of materials indicated for interconnections of members by welding. Use welding method which is appropriate for steel and finish required and

develops strength required to comply with structural performance criteria. Finish exposed welds and surfaces smooth, flush, and blended to match adjoining surfaces.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals

2. Obtain fusion without undercut or overlap.

3. Remove flux immediately.

4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

5. Provide welded connections for ferrous handrails and railings.

D. Form changes in direction of louver screen members by mitering or as indicated on the drawing.

E. Furnish inserts and other anchorage devices for louvers screens systems to concrete or masonry work. Fabricate anchorage devices which are capable of withstanding loadings imposed by louver

screens. Coordinate anchorage devices with supporting structure.

F. Fasteners for Interconnecting Screen Components: Use fasteners fabricated from the same basic metal as fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.

1. Provide concealed fasteners for attaching louver screens to other Work, unless exposed fasteners are unavoidable or standard fastening methods for louver screens are indicated.

G. Cast-in-Place and Post-installed Anchors: Anchors of type indicated below, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when



installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency

1. Cast-in-place anchors.
2. Expansion anchors

H. Unless otherwise required and or intended for the Project, provide automotive lacquer enamel paint finish, for all steel louver screens. Color as required by the Architect.

## **2.21 MISCELLANEOUS FRAMINGS AND SUPPORTS**

A. General: Provide steel framing and supports for applications indicated or which are not a part of structural steel framework, as required to complete work.

B. Fabricate units to sizes, shapes, and profiles indicated and required to receive adjacent other construction retained by framing and support. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.

1. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts, if units must be installed after concrete is placed.
2. Except as otherwise indicated, space anchors are 609.6 mm (24 inches ) o.c. and provide minimum anchor units in the form of steel straps 31.75 mm x 6.35 mm x 203.2 mm (1-¼ inches wide x 1/4 inch x 8 inches ) long.

C. Concealed framings and supports shall be epoxy primed.

D. Lavatory Counter Supports. Provide steel angle supports of sizes required to carry design loads including closures and framings to support stone countertop over 20mm marine plywood substrate. Provide unless otherwise indicated on drawings or directed by the Architect.

E. Provide if Custom Lighting Fixture Supports is intended for the project.

1. Provide schedule 40 stainless steel pipe with 10mm thick stainless steel plate stiffeners, unless otherwise indicated on drawings or required by the designing engineer.
2. Other supports shall be stainless steel unless otherwise indicated on drawings.

## **2.22 MISCELLANEOUS STEEL TRIM, SUPPORT MEMBERS, PLATES, ANGLES, CHANNELS & CLOSURES**

A. Provide shapes and sizes indicated for profiles shown. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and steel bars, with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings, and anchorages as required for coordination of assembly and installation with other work.

B. Provide hot-dip galvanized steel for back-of-the-house applications, unless otherwise required.

C. Provide polished satin stainless steel for exterior applications, unless otherwise required.

## **2.23 STEEL GRILLE DOORS WITH STEEL FRAMES**

- A. Fabricate perimeter door frames from steel sections and profiles intended by the Architect. Door facing shall be from steel bars and grilles of sizes and spacing as indicated on drawings. Thickness of perimeter door frames shall be 44mm, unless otherwise indicated on drawings.
- B. Finish of steel grilles and frames to be automotive lacquer paint finish in color as directed by the Architect.

#### **2.24 FINISHES, GENERAL**

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast
- D. Provide exposed fasteners with finish matching appearance, including color and texture, of handrails and railings.

#### **2.25 STAINLESS STEEL FINISH**

- A. Remove or blend tool and die marks and stretch lines into finish
- B. Grind and polish surfaces to produce uniform, directionally textured polished finish indicated, free of cross scratches. Run grain with long dimension of each piece
- C. Bright, Directional Polish: No. 4 finish, if required for stainless steel handrails. Provide unless otherwise required to be satin finished.
- D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- E. Provide for decorative pool ladders and stainless steel handrails where required at ramps for exterior applications.

#### **2.26 STEEL FINISH**

- A. Galvanized Railings: Hot-dip galvanize exterior steel and iron railings to comply with ASTM A 123. Hot-dip galvanized hardware for exterior steel and iron railings to comply with ASTM A 153/A 153M.

### **STRUCTURAL/CIVIL WORKS**

## **I. Codes and Standards**

The Civil/Structural Works shall be in accordance with the following Codes and Standards

### • Codes

1. National Structural Code of the Philippines (NSCP) 2015
2. National Building Code of the Philippines and its revised IRR .
3. Accessibility Law
4. Local Codes and Ordinances

### . Standards

1. Bureau of Product Standards (BPS)
2. Philippine National Standards (PNS)
3. DPH Blue Book
4. American Concrete Institute (ACI)
5. American Society for Testing Materials (ASTM)
6. American Welding Society (AWS)

### **Minimum Design Requirements:**

1. Concrete : 4000 psi (28 MPa)
2. Reinforced Steel Bars 414 MPa
3. Masonry Wall 300 psi
4. Steel ( Yield Strength ) 2481123 KPa

## **PLUMBING GENERAL SPECIFICATIONS**

The Plumbing Contractor shall assume responsibility for the cost of the entire work and changes thereto as may be deemed necessary for the completion of the project, which may be occasioned by approval of materials other than that specified.

The Plumbing Contractor shall take all the responsibilities for the action of his workmen with regard to safety at the workplace that may result in injuries or to others.

## **SPECIFICATIONS:**

### **PIPES AND FITTINGS**

COLD WATER LINES – Shall be Polypropylene Random Copolymer (PPR) pipes PN20 Brand or Approved Equal Fittings shall be solvent cement joints to ASTM D2564.

SEWER LINES – Shall be High-Density Polyethylene (HDPE) pipe, ISO 4427, Brand or Approved equal, Fittings shall be solvent cement joints to HDPE PE100.

VENT PIPES – shall be Polyvinyl Chloride (PVC) pipe, Series 1000, Brand or Approved equal.

### **1. VALVES**

GATE VALVE – Shall be KITZ Bronze Gate Valve PN20 or Approved equal.

CHECK VALVE – Shall be KITZ Bronze Swing Check Valve PN20 or Approved equal.

### **2. FIXTURES**

GREASE TRAP – Stainless Grease Trap 10 gpm 3 chambers.

URINAL – Wall Hung Urinal

WATER CLOSET – Water Closet Concealed LT white or Approved equal.

WASH Basin – Vessel Type Wash Basin L400 or Approved equal.

TOILET LAVATORY – Branded Lavatory or Approved equal.

TISSUE PAPER HOLDER

DRAINS – JAMAN as Indicated or Approved equal.

KITCHEN FLR. DRAIN

MOP SINK DRAIN

TOILET FLR. DRAIN

HOSE BIBB – Ø25 MM Standard Hose Connection, Male Tapered Threads, Polished Chromium plated with lock.

**OTHER REQUIREMENTS:**

MOP SINK FAUCET – ball faucet Ø 20MM

FLANGED JOINT GASKET – “GARLOCK” or approved equal.

DISSIMILAR PIPES – Adapter fittings shall be used.

**MISCELLANEOUS**

CLEANOUTS – cleanouts shall be the same size as the pipe, location of which shall be extended to an easily accessible location.

TRAPS – every plumbing fixture of equipment requiring connections to the drainage system shall be equipped with a trap. Each trap shall be placed as near as possible to the fixture. No fixture shall be double trapped.

VALVES AND HOSE BIBBS – valves shall be provided on all water supplies to fixtures as specified. Hose bibbs must be polished chromium plated with 15mm male inlet thread hexagon shoulder and 20mm connections.

PIPE HANGERS AND SUPPORTS – Horizontal runs of pipe shall be hung with adjustable wrought iron or malleable iron pipe.

Hangers space not more than 3m apart, except hub and spigot soil pipes which shall have hangers spaced not over 1.5m apart and located near the hub. Hangers shall have short turnbuckles or other approved means of adjustment, wrought iron clamps shall support vertical runs of pipes or collars spaced not more than 9.m apart.

Water and Vent Pipes – 65mm and larger, band type 6.4mm x 25mm flat mild steel or black iron with 15mm round rod with plates and nuts; 50mm and smaller split ring type with 10mm rods with insert plates: toggle bolts, clamps, or expansion shield.

FITTINGS – All changes in pipe sizes on soil, waste and brain lines shall be made of concentric reducers, All changes in directions shall be made by the appropriated use of forty-five degrees (45°) wyees, or long sweep bends, except that sanitary tees may be used on vertical stacks, Short quarter bends or elbows may be used in soil and waste lines where the change in direction is from the horizontal to the vertical and on the discharge from the water closet.

TRAPS – Traps should always be of the same diameter with the mother pipe from the fixtures, which they shall serve; all traps shall have a water seal of at least 32mm with a brass of thumbscrew cleanout at the bottom of the seal.

VENT – Vent shall be taken from the crown of the fixtures, except for water closet traps, in which case, the branch line shall be vented below the trap and above all small waste inlets, so connected as to prevent obstructions. Each vent pipe shall be run separately above the fixture into the adjacent soil pipes, a distance not more than 1.5 meters if more than this distance, the vent shall be run independently through the roof, Main event risers at 4.5 meters along or more shall be connected at the roof with the main water or soil pipes below the lowest vent outlet with a 45° connection.

## **ELECTRICAL AND MECHANICAL**

### **I. Objectives of the Project:**

- 1.1. To perform various electrical, mechanical, and auxiliary works and determine the most suitable and economical design, improvement, and installation by following the latest Philippine Electrical Code (PEC), Philippine Mechanical Code (PMC), and Philippine Electronics Code (PEsC); and
- 1.2. To provide ergonomic offices, facilities, and spaces for employees, visitors, and stakeholders of the City Government of Pasig.

1.3.

### **II. Scope of Work and Deliverables:**

The scope of work consists of furnishing all materials, labor, tools, equipment, and all other incidentals and services necessary to complete the electrical, mechanical, and auxiliary works for the satisfactory completion of the works as indicated on the approved plans and in accordance with the approved Program of Work (POW) and Technical Specifications (TS).

The contractor shall also include the applicable testing and commissioning for electrical, mechanical, and auxiliary works and installation with proper tagging of panelboards and circuit breakers before the turnover of the project. Moreso, The contractor shall turn over the project **SATISFACTORILY COMPLETED**.

### **III. Materials and Workmanship Clause:**

- 3.1. All electrical, mechanical, and auxiliary works shall be in accordance with the latest edition of the PEC, PMC, and PEsC, the laws and ordinances of the local enforcing authorities, and the requirements of the local power utility.
- 3.2. All materials and equipment shall be new and of the approved type for both location and purpose intended.
- 3.3. In case of any discrepancy between the plans and site condition, specification, and revisions/changes, the contractor should immediately verify and consult the Project-In-Charge/Electrical Engineer/Mechanical Engineer/Electronics Engineer.
- 3.4. The contractor shall submit a sample of materials, equipment, and shop drawings in the form of a request letter for approval of the Project-In-Charge/Electrical Engineer/Mechanical Engineer/Electronics Engineer before installation.
- 3.5. The contractor shall conduct testing and commissioning of the installed electrical, mechanical, and auxiliary systems for proper operational conditions.
- 3.6. The contractor shall submit “as-built plans” signed and sealed by the respective engineers and professionals.

- 3.7. Electrical, mechanical, and auxiliary plans/drawings are diagrammatic layouts only. Any materials and fittings not shown on the plans/drawings but needed to complete the systems and operation shall be included in the contractor's scope of work.
- 3.8. All electrical, mechanical, and auxiliary works shall be done under the direct supervision of a duly licensed Electrical Engineer (REE), Mechanical Engineer (RME), and Electronics Engineer (REsE).

**IV. Contractor's Qualification and Staffing Pattern:**

4.1. The contractor shall provide key staff/personnel for the following positions on a full-time or part-time basis on-site:

4.1.1. Professional Electrical Engineer	-	1
4.1.2. Professional Mechanical Engineer	-	1
4.1.3. Professional Electronics Engineer	-	1
4.1.4. Registered Electrical Engineer	-	1
4.1.5. Registered Mechanical Engineer	-	1
4.1.6. Registered Electronics Engineer	-	1
4.1.7. Registered Master Electrician or Electrician with applicable NCII	-	at least 5
4.1.8. Aircon Technician with applicable NCII	-	at least 5
4.1.9. Registered Electronics Technician or Technician with applicable NCII	-	at least 2
4.1.10. Certified Safety Officer with COSH	-	at least 2
4.1.11. Laborer/Helper	-	at least 8

4.2. The contractor shall submit the signed Curriculum Vitae (CV), copies of licenses, certificate of work employment/experience, and other pertinent documents of all the staff as may be applicable, to be nominated in the project and as attachments to the technical proposals during the opening of the bid.



**V. Minimum Expertise and Qualification of Professional and Technical Staff to Handle the Project:**

**5.1. Professional Electrical Engineer**

Must be a Professional Electrical Engineer with at least five (5) years of experience in electrical engineering works and design analysis.

**5.2. Professional Mechanical Engineer**

Must be a Professional Mechanical Engineer with at least five (5) years of experience in mechanical engineering works and design analysis.

**5.3. Professional Electronics Engineer**

Must be a Professional Electronics Engineer with at least five (5) years of experience in electronics engineering works and design analysis.

**5.4. Registered Electrical Engineer**

Must be a Registered Electrical Engineer with at least five (5) years of experience in electrical engineering works and design analysis.

**5.5. Registered Mechanical Engineer**

Must be a Registered Mechanical Engineer with at least five (5) years of experience in mechanical engineering works and design analysis.

**5.6. Registered Electronics Engineer**

Must be a Registered Electronics Engineer with at least five (5) years of experience in electronics and auxiliary engineering works and design analysis.

**5.7. Registered Master Electrician or Electrician with applicable NCII**

Must be a Registered Master Electrician or Electrician with applicable NCII with at least five (5) years of experience in electrical works.

**5.8. Aircon Technician with applicable NCII**

Must be an Aircon Technician with applicable NCII with at least five (5) years of experience in air-conditioning works.

**5.9. Registered Electronics Technician or Technician with applicable NCII**

Must be a Registered Electronics Technician or Technician with applicable NCII with at least five (5) years of experience in electronics and auxiliary works.

**5.10. Certified Safety Officer with COSH**

Must be a Certified Safety Officer with COSH with at least five (5) years of experience as a safety officer in construction.

**5.11. Laborer/Helper**

With at least One (1) year of experience as a Laborer/Helper.

**VI. Warranty:**

One (1) year warranty for parts, materials, and services on poor workmanship under normal usage and operating conditions after completion and acceptance.

**VII. Variation/Change Order/s:**

Variation/Change Order/s 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 a change of plans, program of works, design or alignment to suit actual field conditions whether addition or deletion works are subject to proper evaluation and assessment of the Project-In-Charge, Chief of Electrical Infrastructure Section (EIS), Chief of Planning, Programming, and Construction Division (PPCD), and approval of the Head of the City Engineering Office.

**VIII. Intellectual Property Clause:**

All intellectual property produced and arising, as indicated in the provision above for this project shall be owned by the City Government of Pasig.

**IX. Penalty Clause:**

All contracts executed in accordance with the Act and IRR shall contain a provision on Liquidated Damages (L.D.) which shall be payable by the contractor in case of breach thereof. For the procurement of Goods, Infrastructure Projects, and Consulting Services, the amount of the L.D. shall be at least equal to one-tenth of one percent

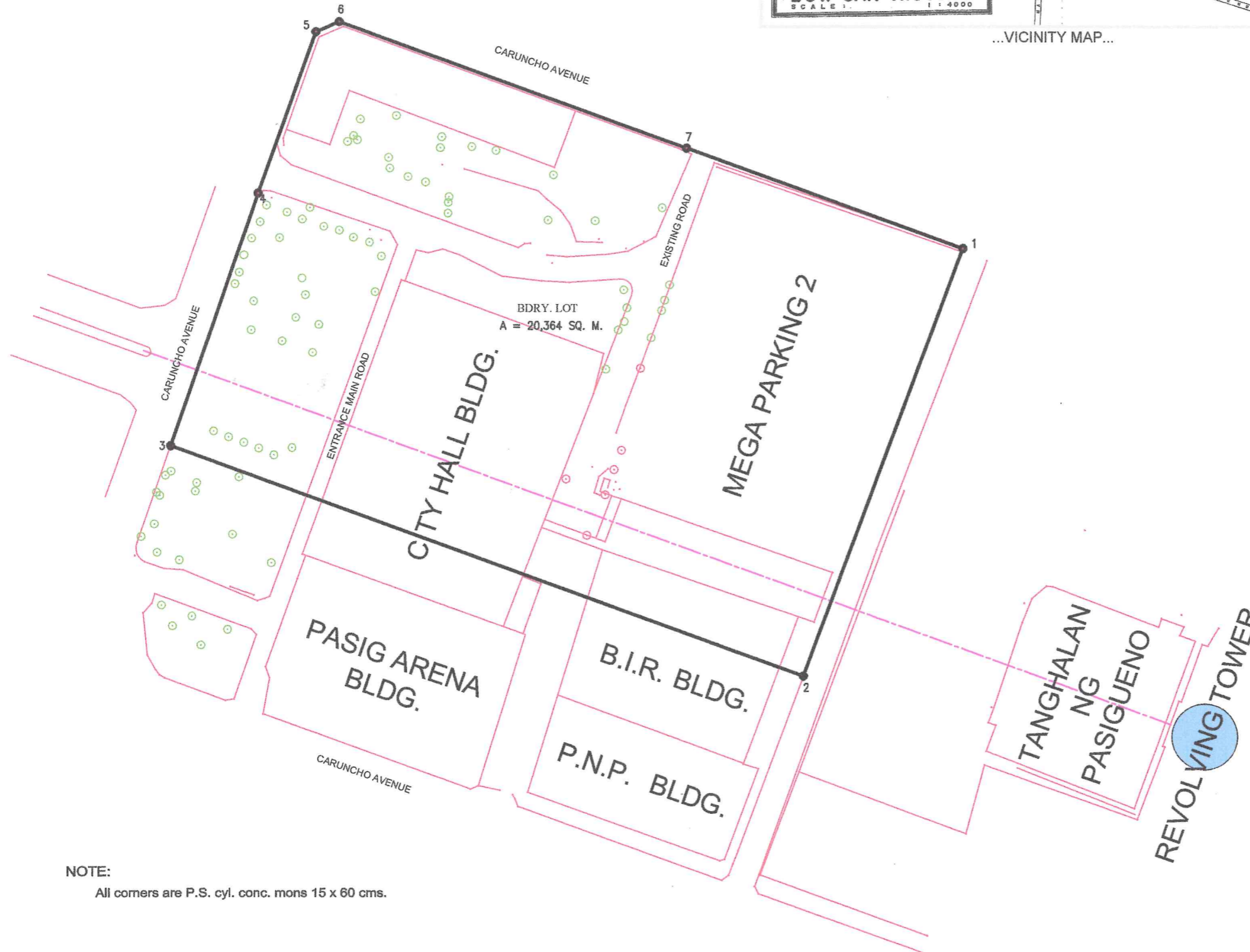
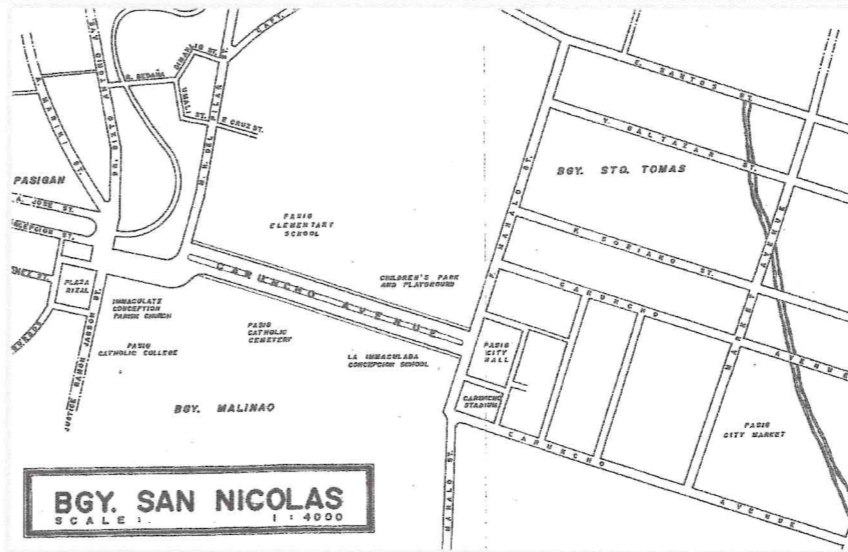
(0.001) of the cost of the unperformed portion for every day of delay. Once the cumulative amount of the L.D. reaches ten percent (10%) of the amount of the contract, the Procuring Entity may rescind or terminate the contract, without prejudice to other courses of action and remedies available under the circumstances.

**PREPARED BY:**

A handwritten signature in blue ink, appearing to be 'ARTAXERXES V. GERONIMO', written over the printed name.

**ENGR. ARTAXERXES V. GERONIMO**  
OIC - City Engineering Office

TECHNICAL DESCRIPTION		
LINE	BEARING	DISTANCE
ASSUMED BDRY.		
1-2	S.20°19'W.	116.96 M.
2-3	N.70°03'W.	173.03 M.
3-4	N.19°00'E.	68.51 M.
4-5	N.19°40'E.	43.89 M.
5-6	N.66°42'E.	6.59 M.
6-7	S.70°05'E.	94.87 M.
7-1	S.70°04'E.	75.44 M.



NOTE:  
All corners are P.S. cyl. conc. mons 15 x 60 cms.

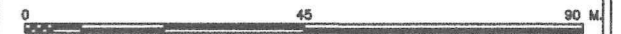
# LOCATION PLAN

PASIG CITY HALL  
AS PREPARED FOR  
CITY GOVT. OF PASIG

SITUATED IN THE

RURBAN CODE :  
BARANGAY OF : SAN NICOLAS  
MUN. OF : PASIG  
PROVINCE OF : METRO MANILA  
ISLAND OF : LUZON  
CONTAINING AN AREA OF 20,364 SQ. M.

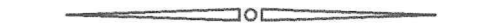
ZONE NO. :  
PPCS-PTM/PRS 92:  
BEARING: TRUE  
SCALE 1: 900



## CERTIFICATION

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date prepared: \_\_\_\_\_  
GEODETTIC ENGINEER  
Reg. Cert. No. : \_\_\_\_\_ Date : \_\_\_\_\_  
License No. : \_\_\_\_\_ Date : \_\_\_\_\_



Republic of the Philippines  
Department of Environment and Natural Resources

### VERIFICATION

I certify that this survey plan is verified and found to conform with survey data / records on file in this office.  
**THIS PLAN SHALL NOT BE USED FOR LAND REGISTRATION.**

DATE \_\_\_\_\_ 20 \_\_\_\_\_  
PURPOSE \_\_\_\_\_

CHIEF, REGIONAL SURVEYS DIVISION

Date Submitted \_\_\_\_\_

ADDITIONAL INFORMATION AFTER DATE OF VERIFICATION

**The Number of Storeys and Total Floor Area should accommodate the following details:**

<b>FLOOR</b>	<b>DETAILS</b>
<b>Number of Storeys: 7</b>	<ol style="list-style-type: none"> <li>1. 4,176 number of employees;</li> <li>2. Daily foot traffic of approx. 9,000-11,000 clients/guests/visitors (note: the daily foot traffic during business permit renewal season reaches up to 13,000);</li> <li>3. City Health Department Ambulatory Services, such as: Drug Testing, Dental Clinic, Radiology, Clinical Laboratory, Areas for Counselling/Family Planning Seminars, Animal Bite Clinic, and a Pharmacy;</li> <li>4. Session Hall, with a gallery that can accommodate approx. 100 pax;</li> <li>5. Large Conference Halls;</li> <li>6. Prayer Rooms;</li> <li>7. Compliant to requirements needed by the DILG (See: Seal of Good Local Governance Requirements);</li> <li>8. Compliant with the National Building Code;</li> <li>9. Compliant with the Zoning Ordinance of the City;</li> <li>10. Swing space for offices that will be affected by Phase II</li> </ol>
<b>Lower Ground Floor</b>	<ol style="list-style-type: none"> <li>1. Increase number of Commercial Spaces</li> <li>2. Parking Spaces</li> <li>3. Landbank</li> <li>4. Payroll section (Pagador) - 13 employees</li> <li>5. Canteen (low cost hot meals)</li> <li>6. Public Safety Division - 33 employees</li> <li>7. Utility Office - 9 employees</li> <li>8. PNP Detachment Office - 7 employees</li> </ol>
<b>Upper Ground Floor</b>	<ol style="list-style-type: none"> <li>1. Senior Citizens' Center (with an open space for gatherings, meetings, welfare events)</li> <li>2. Office of Senior Citizens Affairs (OSCA) - 33 employees</li> <li>3. Social Welfare Assistance Center (SWAC) - 30 employees</li> <li>4. Persons with Disabilities Affairs Office (PDAO) - 23 employees</li> <li>5. Civil Society Organization's (CSO) Desk and Multipurpose Hall - 23 employees</li> </ol>

FLOOR	DETAILS
	<ol style="list-style-type: none"> <li>6. Local Youth Development Office (LYDO) - 9 employees</li> <li>7. Community Relations and Information Office - 30 employees</li> <li>8. Public Employment Service Office - 17 employees</li> <li>9. Local Economic Development and Investment Office (LEDIO) - 29 employees (and Cooperative Development Office (CDO) - 8 employees)</li> <li>10. COOP Office - 7 employees</li> <li>11. Ugnayan sa Pasig - 23 employees</li> <li>12. Muslim Prayer Rooms</li> <li>13. Ecumenical Chapel</li> <li>14. Child's Daycare / Playroom</li> <li>15. Gender and Development Office - 42 employees</li> <li>16. Office on Social Welfare Development - 43 employees</li> <li>17. Use of Open Lobby as additional waiting area, especially during January Business Renewal Season</li> </ol>
<b>3<sup>rd</sup> Floor</b>	<ol style="list-style-type: none"> <li>1. Entire Podium parking space to be for Pay Parking</li> <li>2. Ample storage spaces for the City</li> </ol>
<b>4<sup>th</sup> Floor</b>	<ol style="list-style-type: none"> <li>1. <b>Business One Stop Shop Wing</b> <ol style="list-style-type: none"> <li>a. City Planning and Development Office (CPDO) - 88 employees;</li> <li>b. Office of the Building Official (OBO) window;</li> <li>c. Sanitary Permit Office window;</li> <li>d. City Environment and Natural Resources Office (CENRO) and Solid Waste Management Office (SWMO) - 44 employees;</li> <li>e. Bureau of Fire Protection window; and</li> <li>f. Business Permit and Licensing Office (BPLD) - 132 employees</li> </ol> </li> <li>2. <b>Construction One Stop Shop Wing</b> <ol style="list-style-type: none"> <li>a. City Planning and Development Office (CPDO);</li> <li>b. Office of the Building Official (OBO) - 96 employees;</li> <li>c. Excavation Unit - City Engineering window;</li> </ol> </li> <li>3. <b>City Health One Stop Shop Wing (must be compliant with DOH standards) - 459 employees</b> <ol style="list-style-type: none"> <li>a. City Health Department (CHD)</li> <li>b. Drug Testing</li> <li>c. Dental Clinic</li> </ol> </li> </ol>

FLOOR	DETAILS
	<ul style="list-style-type: none"> <li>d. Radiology</li> <li>e. Clinical Laboratory</li> <li>f. Areas for Counselling/Family Planning Seminars</li> <li>g. Animal Bite Clinic</li> <li>h. Pharmacy</li> <li>i. City Epidemiology and Surveillance Unit (CESU)</li> <li>j. Substance Abuse Treatment Out Patient</li> <li>k. Pasig Blood Center</li> <li>l. Employee's Clinic <ul style="list-style-type: none"> <li>• Department of Health (DOH) - 5 employees</li> </ul> </li> <li>4. <b>Treasury Wing</b> <ul style="list-style-type: none"> <li>a. Treasurer's Office - 88 employees</li> <li>b. Assessor's Office - 75 employees</li> <li>c. Cashiers for All CGP Transactions</li> <li>d. Land Tax - 62 employees</li> </ul> </li> <li>5. <b>Local Civil Registry</b> - 61 employees</li> </ul>
<b>5<sup>th</sup> Floor</b>	<ul style="list-style-type: none"> <li>1. Engineering Department - 264 employees</li> <li>2. Office of the General Services (OGS) - 204 employees</li> <li>3. Commission on Audit (COA) - 33 employees</li> <li>4. Procurement Management Office (PMO) - 78 employees</li> <li>5. Internal Audit Services (IAS) - 13 employees</li> <li>6. Human Resources Development Office (HRDO) - 179 employees</li> <li>7. Management Information Systems Office (MISO) - 109 employees</li> <li>8. Pasig Urban Settlement Office (PUSO) - 35 employees</li> <li>9. City Hall Library (inside: Pasig Research Center) - 7 employees</li> <li>10. Clean and Green Office - 20 employees</li> <li>11. Urban Poor Services Division Office - 14 employees</li> <li>12. Public Information Office (PIO) - 22 employees</li> <li>13. Education Unit - 25 employees</li> <li>14. City Transport and Development Management Office - 44 employees</li> <li>15. Records Section - 38 employees *should be beside the City Hall Library</li> <li>16. City Disaster Risk Management (Administrative Office)- 49 employees</li> <li>17. Tobacco Unit - 12 employees</li> </ul>

<b>FLOOR</b>	<b>DETAILS</b>
	18. Cultural Affairs and Tourism Office - 12 employees
<b>6<sup>th</sup> Floor</b>	<ol style="list-style-type: none"> <li>1. Office of the Vice Mayor - 34 employees</li> <li>2. Fourteen (14) Offices for Councilors - 18 employees each councilor *Anticipate possible addition of district(s) to Pasig that will result to an addition to the number of councilors</li> <li>3. Session Hall - Gallery may accommodate 100 pax</li> <li>4. Conference Halls - to accommodate 200 pax that can also be converted to breakout rooms via collapsible walls</li> <li>5. Council Secretariat Office - 20 employees</li> <li>6. City Council Lounge</li> <li>7. Liga ng mga Barangay Office - 12 employees</li> <li>8. Auditorium</li> </ol>
<b>7<sup>th</sup> Floor</b>	<ol style="list-style-type: none"> <li>1. Office of the City Mayor - 57 employees</li> <li>2. Executive Lounge</li> <li>3. People's Day Area - to accommodate 200 pax</li> <li>4. Office of the City Administrator (OCA) 29 employees</li> <li>5. Office of the City Legal - 20 employees</li> <li>6. Office of the City Budget - 20 employees</li> <li>7. Accounting - 75 employees</li> <li>8. Land Management and Recovery Office - 7 employees</li> <li>9. Office of the Congressman - 72 employees *Anticipate possible addition of district(s) to Pasig that will result to an addition to the Congressman(s) or Congresswoman(s)</li> <li>10. Hearing room(s) for Administrative Hearing Board hearings</li> </ol>