SOCIAL SECURITY SYSTEM

PHILIPPINE BIDDING DOCUMENTS

Sixth Edition

Procurement of INFRASTRUCTURE PROJECTS

Government of the Republic of the Philippines

RETROFITTING OF SSS OWNED BUILDING - DAVAO

IB-SSS-CIVIL-2022-009

OCTOBER 2022

REGINE M. IGNACIO
TWG Chairperson

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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.

SSS – Social Security System.

Supplier – refers to a citizen, or any corporate body or commercial company duly organized and registered under the laws where it is established, habitually established in business and engaged in the manufacture or sale of the merchandise or performance of the general services covered by his bid. (Item 3.8 of GPPB Resolution No. 13-2019, dated 23 May 2019). Supplier as used in these Bidding Documents may likewise refer to a distributor, manufacturer, contractor, or consultant.

UN – United Nations.

Section I. Invitation to Bid

REPUBLIC OF THE PHILIPPINES
SOCIAL SECURITY SYSTEM
East Avenue, Diliman, Quezon City
Tel. Nos. (632)8709-7198
E-mail: member_relations@sss.gov.ph*Website http://www.sss.gov.ph

Invitation to Bid
ITB-SSS-Civil-2022-009

RETROFITTING OF SSS-OWNED BUILDING - DAVAO

Approved Budget for the Contract (ABC) & Source of Fund	*Delivery/ Completion Period*	*Price of Bid Documents (non-refundable)*	*Schedule of Activities Date/Time*	
			Pre-bid Conference	*Deadline of submission and receipt of bids*
₱ 14,314,174.00 Approved 2022 Corporate Operating Budget – Capital Outlay included in the APP Update for the month of April (15th Update) with Code PAP 2022-105A of the Annual Procurement Plan	Two Hundred Forty (240) Calendar Days from receipt of Notice to Proceed and Signed Contract	₱ 11,500.00	*October 14, 2022 (Friday) 2:30pm*	*November 3, 2022 (Thursday) 2:00pm*

1. The ***SOCIAL SECURITY SYSTEM (SSS)*** now invites bids for the above Procurement Project. Completion of the Works is required **within the period of Two Hundred Forty (240) calendar days. Bidders should have completed within five (5) years prior to the date of submission and receipt of bids**, 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).

2. Bids received in excess of the ABC shall be automatically rejected at Bid opening.

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 ***SSS*** and inspect the Bidding Documents at the address in the last item of the IB from Monday to Friday, 8:00 a.m. to 5:00 p.m.

5. A complete set of Bidding Documents may be acquired by interested Bidders starting **06 October 2022 up to the scheduled submission & opening of bids** from the address stated in the last item of the IB and upon payment of the applicable fee for the Bidding Documents, in the amount specified above.

   The mode of payment will be on a cash basis payable at the SSS Cash Department, SSS Main Bldg., Ground Floor, upon accomplishment of SSS Form R-6. The Bidding Documents shall be received personally by the prospective Bidder or his authorized representative.

   It may also be downloaded free of charge from the website of the Philippine Government Electronic Procurement System (PhilGEPS) and the website of the SSS, provided that Bidders shall pay the applicable fee for the Bidding Documents not later than the submission of their bids.

6. The SSS will hold a Pre-Bid Conference on the date and time specified above at the Bidding Room (formerly CDPRD Computer Room), 2nd Floor, SSS Main Bldg., East Avenue, Diliman, Quezon City which shall be open to prospective bidders, but attendance shall not be mandatory.

   The Pre-Bid Conference will be conducted through online conference using Microsoft Teams. Kindly e-mail us on or before 13 October 2022, through e-mail address bac@sss.gov.ph, the following:

   a. Name of the representative and e-mail address; and
   b. Technical and administrative queries.

7. Bids must be duly received by the BAC Secretariat at the Bidding Room, 2nd Floor, SSS Main Building, East Avenue, Diliman, Quezon City on the deadline specified above. All Bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in the **ITB** Clause 15.

   Bid opening shall be on the date and time specified above at the Bidding Room, 2nd Floor, SSS Main Building, East Avenue, Diliman, Quezon City. Bids will be opened in the presence of the Bidders' representatives who choose to attend at the address above. Late bids shall not be accepted.

8. References to the dates and times shall be based on Philippine Standard time. Should any of the above dates fall on a holiday, the deadline shall be extended to the same time on the immediately succeeding business day in Quezon City.

9. The SSS 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 Section 35.6 and 41 of RA 9184 and its IRR, without thereby incurring any liability to the affected bidder or bidders.

10. The SSS assumes no obligation to compensate or indemnify parties for any expense or loss that they may incur as a result of their participation in the procurement process, nor does SSS BAC guarantees that an award will be made as a result of this invitation. Furthermore, the SSS reserves the right to waive any defects or formality in the responses to the eligibility requirements and to this invitation and reserves the right to accept the proposal most advantageous to the agency.

11. For further information, please refer to:

    Bids & Awards Committee
    The Secretariat
    2nd Flr., SSS Main Bldg., East Ave., Diliman, Q.C.
    Tel # (632) 8922-1070; 87009-7198 local 5492 & 6382
    Email – bac@sss.gov.ph

12. Bidding documents may be downloaded from the PROCUREMENT tab at **www.sss.gov.ph** starting **06 October 2022**.

ref.: itb-sss-civil-2022-009- Retrofitting of SSS-Owned Building - Davao

Section II. Instructions to Bidders

1. Scope of Bid

The Procuring Entity, *Social Security System* wishes to receive Bids for the Retrofitting of SSS-Owned Building - Davao, with identification number *IB-SSS-Civil-2022-009.*

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 *CY2022* in the amount of Fourteen Million Three Hundred Fourteen Thousand One Hundred Seventy-Four Pesos (P 14,314,174.00).

2.2. The source of funding is: Approved 2022 Corporate Operating Budget – Capital Outlay included in the APP Update for the month of April (15th Update) with Code PAP 2022-105A of the Annual Procurement Plan.

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 Procuring Entity has prescribed that: **Subcontracting is not allowed.**

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and either at its physical address **Bidding Room, 2nd Floor, SSS Main Bldg., East Avenue, Diliman, Quezon City and/or through online conference using Microsoft Teams** 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 PCAB License is required, and in case of joint ventures, a valid special PCAB License, 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 **one hundred twenty (120) calendar days reckoned from the date of the submission and opening of bids**. 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**.

Section III. Bid Data Sheet

Bid Data Sheet

<table>
<tr><th>ITB Clause</th><th></th></tr>
<tr><td>5.2</td><td>For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be projects involving structural retrofitting of buildings, bridges and similar structures using fiber-reinforced polymer (FRP) system as the primary retrofitting methodology and materials used within Five (5) years prior to the date of submission and receipt of bids.</td></tr>
<tr><td>7.1</td><td>Subcontracting is not allowed.</td></tr>
<tr><td>10.3</td><td>PCAB License and Registration

License Category : C & D
Size Range : Small B
Classification : General Building

The bidder shall have at least five (5) years of experience in construction/ structural retrofitting works.</td></tr>
<tr><td>10.4</td><td>The key personnel must meet the required minimum years of experience set below:

<table>
<tr><th>Key Personnel</th><th>General Experience</th><th>Relevant Experience</th></tr>
<tr><td>Project Manager</td><td>10 years</td><td>Building construction and/or structural retrofitting</td></tr>
<tr><td>Project Engineer/ Site Engineer</td><td>5 years</td><td>Building construction and/or structural retrofitting</td></tr>
<tr><td>Foreman</td><td>5 years</td><td>Building construction and/or structural retrofitting</td></tr>
</table>

Except for the Foreman, all key personnel should be PRC-registered engineers / architects in good standing.</td></tr>
<tr><td>10.5</td><td>The minimum major equipment requirements are the following:

Electric Grinders
Dust Collector/Vacuum
Portable Jackhammer
Epoxy Mixing Unit (Poser Drive Propeller Type Blade)
Pressure Pot</td></tr>
<tr><td>12</td><td>Alternative bids shall not be accepted.</td></tr>
<tr><td>15.1</td><td>The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts:

a. The amount of not less than ₱ 286,283.48, if bid security is in cash, cashier’s/manager’s check, bank draft/guarantee or irrevocable letter of credit;

b. The amount of not less than ₱ 715,708.70, if bid security is in Surety Bond.</td></tr>
<tr><td>19.2</td><td>Partial bid is not allowed. The infrastructure 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.</td></tr>
</table>

20	The Lowest Calculated Bidder shall submit the following: 1. Registration certificate from Securities and Exchange Commission (SEC) for corporation including Articles of Incorporation and General Information Sheet (GIS), Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives or its equivalent document 2. Mayor's or Business permit issued by the city or municipality where the principal place of business of the prospective bidder is located, or the equivalent document for Exclusive Economic Zones or Areas; 3. Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR) 4. Latest Audited Financial Statements 5. Latest income tax return corresponding to the Audited Financial Statements submitted, filed electronically (EFPS); 6. Quarterly VAT (business tax returns) per Revenue Regulations 3-2005 for the last six (6) months prior to the submission and opening of bids filed electronically (EFPS);
21	Not applicable.

Section IV. General 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

Special Conditions of Contract

GCC Clause	
2	No sectional completion date.
3.1	The **SOCIAL SECURITY SYSTEM** shall give possession of all parts of the Site to the Contractor for the duration of the contract (240 cd) which shall commence upon receipt of the Notice to Proceed and Contract/Job Order. Contract duration is inclusive of two (2) months for processing/securing of building permits from LGU's Office of the Building Official (OBO).
6	Not Applicable
7.2	Fifteen (15) years.
8	**Liability of the Contractor** 1. CONFIDENTIALITY. Neither party shall, without the prior written consent of the other, disclose or make available to any person, make public, or use directly or indirectly, except for the performance and implementation of the works, any confidential information, acquired from an information holder in connection with the performance of this Contract, unless: (i) the information is known to the disclosing party, as evidenced by its written records, prior to obtaining the same from the information holder and is not otherwise subject to disclosure restrictions on the disclosing party, (ii) the information is disclosed to the disclosing party by a third party who did not receive the same, directly or indirectly, from an information holder, and who has no obligation of secrecy with respect thereto, or (iii) required to be disclosed by law. The obligation of confidentiality by both parties, as provided herein, shall survive the termination of the Agreement. 2. MERGER AND CONSOLIDATION. In case of merger, consolidation or change of ownership of the CONTRACTOR with other company, it is the responsibility of the surviving company/consolidated company/acquiring entity to inform SSS of the change in corporate structure/ownership. Failure to do so shall translate in such company assuming all liabilities of the acquired/merged company under the Agreement. 3. FORCE MAJEURE. SUPPLIER shall not be liable for forfeiture of its performance security, liquidated damages, or termination for default if and to the extent that CONTRACTOR's delay in performance or other failure to perform its obligations under this Agreement is the result of a force majeure. For purposes of this Agreement the terms "force majeure" and "fortuitous event" may be used interchangeably. In this regard, a fortuitous event or force majeure shall be interpreted to mean an event which CONTRACTOR could not have foreseen, or which though foreseen, was inevitable. It shall not include ordinary unfavorable weather conditions; and any other cause the effects of which could have been avoided with the exercise of reasonable diligence by CONTRACTOR. Such events may include, but not limited to, acts of SSS in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

If a force majeure situation arises, CONTRACTOR shall promptly notify SSS in writing of such condition and the cause thereof. Unless otherwise directed by SSS in writing, CONTRACTOR shall continue to perform its obligations under this Agreement as far as is reasonably practical and shall seek all reasonable alternative means for performance not prevented by the force majeure.

4. NON-ASSIGNMENT. CONTRACTOR shall not assign its rights or obligations under this Agreement, in whole or in part, except with SSS's prior written consent. CONTRACTOR shall not subcontract in whole or in part the PROJECT and deliverables subject of this Agreement without the written consent of SSS.

5. WAIVER. Failure by either party to insist upon the other strict performance of any of the terms and conditions hereof shall not be deemed a relinquishment or waiver of any subsequent breach or default of the terms and conditions hereof, which can only be deemed made if expressed in writing and signed by its duly authorized representative. No such waiver shall be construed as modification of any of the provisions of the Agreement or as a waiver of any past or future default or breach hereof, except as expressly stated in such waiver.

6. CUMULATIVE REMEDIES. Any and all remedies granted to the parties under the applicable laws and the Contract shall be deemed cumulative and may therefore, at the sole option and discretion, be availed of by the aggrieved party simultaneously, successively, or independently.

7. NO EMPLOYER-EMPLOYEE RELATIONSHIP. It is expressly and manifestly understood and agreed upon that the employees of CONTRACTOR assigned to perform the PROJECT are not employees of SSS. Neither is there an employer-employee relationship between SSS and CONTRACTOR.

   The Agreement does not create an employer-employee relationship between SSS and the CONTRACTOR including its personnel; that the services rendered by the personnel assigned by CONTRACTOR to SSS in the performance of its obligation under the contract do not represent government service and will not be credited as such; that its personnel assigned to SSS are not entitled to benefits enjoyed by SSS' officials and employees such as Personal Economic Relief Allowance (PERA), Representation and Transportation Allowance (RATA), ACA, etc.; that these personnel are not related within the third degree of consanguinity or affinity to the contracting officer and appointing authority of SSS; that they have not been previously dismissed from the government service by reason of an administrative case; that they have not reached the compulsory retirement age of sixty-five (65); and that they possess the education, experience and skills required to perform the job. The CONTRACTOR hereby acknowledges that no authority has been given by SSS to hire any person as an employee of the latter. Any instruction given by SSS or any of its personnel to CONTRACTOR's employees are to be construed merely as a measure taken by the former to ensure and enhance the quality of project performed hereunder. The CONTRACTOR shall, at all times, exercise supervision and control over its employees in the performance of its obligations under the contract.

8. PARTNERSHIP. Nothing in the contract shall constitute a partnership between the parties. No party or its agents or employees shall be deemed to be the agent, employee or representative of any other party.

	9. COMPLIANCE WITH SS LAW. CONTRACTOR shall report all its employees to SSS for coverage and their contributions, as well as, all amortizations for salary/education/calamity and other SSS loans shall be updated. Should CONTRACTOR fail to comply with its obligations under the provisions of the SS Law and Employees' Compensation Act, SSS shall have the authority to deduct any unpaid SS and EC contributions, salary, educational, emergency and/or calamity loan amortizations, employer's liability for damages, including interests and penalties from CONTRACTOR's receivables under this Agreement. Further, prescription does not run against SSS for its failure to demand SS contributions or payments from CONTRACTOR. Moreover, CONTRACTOR shall forever hold in trust SS contributions or payments of its employees until the same is fully remitted to SSS. 10. COMPLIANCE WITH LABOR LAWS. CONTRACTOR, as employer of the personnel assigned to undertake the PROJECT, shall comply with all its obligations under existing laws and their implementing rules and regulations on the payment of minimum wage, overtime pay, and other labor-related benefits as well as remittances or payment of the appropriate amount or contributions/payment (SSS, EC, Pag-IBIG, PhilHealth and taxes) with concerned government agencies/offices. It is agreed further, that prior to the release of any payment by SSS to SUPPLIER, its President or its duly authorized representative, shall submit a sworn statement that all monies due to all its employees assigned to the PROJECT as well as benefits by law and other related labor legislation have been paid by CONTRACTOR and that he/she assumed full responsibility thereof. 11. COMPLIANCE WITH TAX LAWS. CONTRACTOR shall, in compliance with tax laws, pay the applicable taxes in full and on time and shall regularly present to SSS within the duration of the Contract, tax clearance from the Bureau of Internal Revenue (BIR) as well as copy of its income and business tax returns duly stamped by the BIR and duly validated with the tax payments made thereon. Failure by CONTRACTOR to comply with the foregoing shall entitle SSS to suspend payment of the Contract Price. As required under Executive Order (EO) 398, s. 2005, CONTRACTOR shall submit income and business tax returns duly stamped and received by the BIR, before entering and during the duration of this Agreement. CONTRACTOR, through its responsible officer, shall also certify under oath that it is free and clear of all tax liabilities to the government. CONTRACTOR shall pay taxes in full and on time and that failure to do so will entitle SSS to suspend or terminate this Agreement. 12. LIQUIDATED DAMAGES. If CONTRACTOR fails to satisfactorily deliver any or all of the Goods and/or to perform the Services within the period(s) specified in the PBD inclusive of duly granted time extensions if any, SSS shall, without prejudice to its other remedies under this Agreement and under the applicable law, deduct from the Contract Price, as liquidated damages, the applicable rate of one tenth (1/10) of one (1) percent of the cost of the unperformed portion for every day of delay until actual delivery or performance. Once the amount of liquidated damages reaches ten percent (10%), SSS may rescind or terminate this Agreement, without prejudice to other courses of action and remedies open to it.

	13. HOLD FREE and HARMLESS. SUPPLIER agrees to defend, indemnify, and hold SSS free and harmless from any and all claims, damages, expenses, fines, penalties and/or liabilities of whatever nature and kind, whether in law or equity, that may arise by reason of the implementation of the Agreement. In addition, CONTRACTOR agrees to indemnify SSS for any damage as a result of said implementation. SUPPLIER hereby assumes full responsibility for any injury, including death, loss or damage which may be caused to SSS' employees or property or third person due to CONTRACTOR's employees' fault or negligence, and further binds itself to hold SSS free and harmless from any of such injury or damage. SSS shall not be responsible for any injury, loss or damage which CONTRACTOR or any of its employees may sustain in the performance of CONTRACTOR's obligations under this Agreement. 14. SETTLEMENT OF DISPUTES. If any dispute or difference of any kind whatsoever shall arise between SSS and CONTRACTOR in connection with or arising out of this Agreement, the Parties shall make every effort to resolve amicably such dispute or difference by mutual consultation. If after thirty (30) days, the Parties have failed to resolve their dispute or difference by such mutual consultation, then either SSS or CONTRACTOR may give notice to the other Party of its intention to commence arbitration, in accordance with RA No. 876, otherwise known as the "Arbitration Law" and RA No. 9285, otherwise known as the "Alternative Dispute Resolution Act of 2004," in order to settle their disputes. No arbitration in respect of this matter may be commenced unless such notice is given. Notwithstanding any reference to arbitration herein, the Parties shall continue to perform their respective obligations under this Agreement unless they otherwise agree. 15. VENUE OF ACTIONS. In the event court action is necessary in order to promote Arbitration, such action shall be filed only before the proper courts of Quezon City, to the exclusion of all other venues. 16. GOVERNING LAW. The Agreement shall be governed by and interpreted according to the laws of the Republic of the Philippines. 17. AMENDMENTS. This Agreement may be amended only in writing and executed by the parties or their duly authorized representatives. 18. SEPARABILITY. If any one or more of the provisions contained in the contract or any document executed in connection herewith shall be invalid, illegal or unenforceable in any respect under any applicable law, then: (i) the validity, legality and enforceability of the remaining provisions contained herein or therein shall not in any way be affected or impaired and shall remain in full force and effect; and (ii) the invalid, illegal or unenforceable provision shall be replaced by the parties immediately with a term or provision that is valid, legal and enforceable and that comes closest to expressing the intention of such invalid illegal or unenforceable term of provision. 19. BINDING EFFECT. The Agreement shall be binding upon the Parties hereto, their assignee/s and successor/s-in-interest.
10	Dayworks are applicable at the rate shown in the Contractor's original Bid.

<table>
<tr><td>11.1</td><td>The Contractor shall submit the Program of Work to the Procuring Entity’s Representative within five (5) calendar days of delivery of the Notice of Award and conduct of pre-construction meeting.</td></tr>
<tr><td>11.2</td><td>The amount to be withheld for late submission of an updated Program of Work shall be ten percent (10%) of the cost of accomplishment of the progress billing on top of the usual ten percent (10%) retention money.</td></tr>
<tr><td>13</td><td>Advance payment is not allowed.</td></tr>
<tr><td>14</td><td>Progress payment shall be made in four (4) billings and upon written request by the Contractor, following the matrix below:
<table>
<tr><th>PROGRESS PAYMENT</th><th>BASIS OF PAYMENT</th></tr>
<tr><td>1st Billing</td><td>Fifteen percent (15%) upon,
(a) Submission to and acceptance by the procuring entity of an irrevocable standby letter of credit of equivalent value from a commercial bank, a bank guarantee or a surety bond callable upon demand, issued by a surety or insurance company duly licensed by the Insurance Commission and confirmed by the procuring entity; and
(b) Submission of approved duly signed and sealed plans and permits by the respective LGU’s Office of the Building Official.</td></tr>
<tr><td>2nd Billing</td><td>Thirty-Five percent (35%) or more work accomplishments</td></tr>
<tr><td>3rd Billing</td><td>Seventy percent (70%) or more work accomplishments</td></tr>
<tr><td>4th or Final Billing</td><td>One Hundred percent (100%) completion of the project and upon issuance of Certificate of Completion as certified by the Procuring Entity’s Representative/s</td></tr>
</table>
Materials and equipment delivered on the site but not completely put in place shall not be included for payment.

The 10% amount of retention money and the cumulative value of the work previously certified and paid for shall be deducted from the progress payments as prescribed in item 5 of Annex E of the Revised IRR of RA 9184.</td></tr>
<tr><td>15.1</td><td>The date by which “as built” drawings are required is within two (2) weeks after the completion of the project.</td></tr>
<tr><td>15.2</td><td>Until the Procuring Entity’s Representative gives its approval on the required “as-built” drawings, ten percent (10%) of the billing shall be withheld.</td></tr>
</table>

Section VI. Specifications

SECTION 02100
PREPARATION OF SITE

PART 1 – GENERAL

1.1 SCOPE OF WORK

The Work includes furnishing all labor, materials, tools and equipment required for the preparation of the Site prior to construction.

1.2 SUBMITTALS *(to be submitted during implementation stage)*

A. Detailed working drawings.

1.3 PROTECTION

The Contractor shall exercise the greatest care in protecting existing structures and piping while proceeding with work under this Section. All repairs required because of damage from the Contractor's operations shall be at the expense of the Contractor and no claims for additional payment will be accepted.

PART 2 – PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 CLEARING, GRUBBING AND STRIPPING

A. Except as otherwise directed, cut, grub, remove and dispose of all trees, stumps, brush, shrubs, roots, paving and any other objectionable material within the construction limits shown on the Drawings. All stumps, brush and roots shall be grubbed and removed from the site.

B. Protect the area beyond the limits of grading shown on the Drawings and any trees designated by the Engineer from damage by any construction operation by erecting suitable barriers or other approved means.

C. Strip topsoil from all areas to be occupied by buildings, trenches, roadways, the sludge lagoons, and all other areas to be excavated or filled. Avoid mixing topsoil with subsoil and stockpile it in areas on the site as approved by the Engineer. Topsoil shall be stockpiled free from brush, trash, large stones and other extraneous material. Any topsoil remaining, after all work is in place, shall be disposed of by the Contractor as directed by the Engineer.

**** END OF SECTION ****

SECTION 02200
EXCAVATION, BACKFILL, FILL, GRADING AND SLOPE PROTECTION

PART 1 – GENERAL

1.1 SCOPE OF WORK

The Work includes furnishing all labor, materials, equipment and incidentals necessary to perform all excavation, backfilling, filling, grading, and slope protection as shown on the Drawings.

1.2 RELATED SECTIONS

Other Sections of the Specifications shall also apply to the extent required for proper performance of this Work.

Section 33001	Site Preparation
Section 33003	Yard Piping
Section 33004	Roadways and Paving
Section 33006	Loaming and Seeding
Section 33007	Waste Water Disposal System

1.3 SPECIFICATIONS AND STANDARDS

Except as otherwise indicated, the current editions of the following Standards apply to the WORK of this Section:

ASTM D698	Laboratory Compaction Characteristics of Soil Using Standard Effort
ASTM D1556	Density of Soil in Place by the Sand Cone Method
ASTM D1557	Laboratory Compaction Characteristics of Soil Using Modified Effort
ASTM D2487	Classification of Soils for Engineering Purposes (Unified Soil Classification System)

1.4 SUBMITTALS *(to be submitted during implementation stage)*

A. Proposed methods of construction including dewatering, excavation, sheeting, bracing, filling, compaction and backfilling for the various portions of the project.

B. Samples as required by the applicable Reference Standards and under Part 2 – PRODUCTS of this Specification.

1.5 QUALITY ASSURANCE

The Contractor is responsible for the performance of all tests and inspection required by this Standard Specification. However, the owner reserves the right to perform any or all prescribed tests and inspection where such is deemed necessary to ensure that materials conform to the specifications, and to be paid for by the Contractor.

1.6 PROTECTION

A. Sheeting and Bracing – General

1. The Contractor shall furnish, put in place and maintain such sheeting and bracing as may be required to support the sides of excavations, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction, and to protect adjacent structures from undermining or other damage. If, in the opinion of the Engineer, sufficient or proper supports have not been provided, additional supports shall be put in at the expense of the Contractor. The Contractor is responsible for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled with compacted granular fill and rammed.

2. The Contractor shall leave in place all sheeting and bracing which the Engineer may direct him in writing to leave in place at any time during the progress of the Work for the purpose of preventing injury to structures, utilities or property, whether public or private.

3. All sheeting and bracing not left in place shall be carefully removed in such a manner as not to endanger the construction of other structures, utilities or property. All voids left or caused by withdrawal of sheeting shall be immediately refilled with compacted granular material by ramming with tools especially adapted to that purpose, or by other means as approved.

4. The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his part to issue such orders, and his failure to exercise his right to do so shall not relieve the Contractor from liability to damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.

5. No wood sheeting shall be withdrawn if driven below mid-diameter of any pipe, and under no circumstances shall any wood sheeting be cut off at a level lower than one foot above top of any pipe.

B. Pumping and Drainage

1. The Contractor shall at all times during construction, provide and maintain proper equipment and facilities to remove all water entering excavations. Excavations shall be kept dry so as to obtain a satisfactory undisturbed sub-grade foundation until the fills or structures to be built thereon have been completed to such extent that they will not be floated or damaged by allowing water levels to return to natural levels.

2. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the sub-grade soils at proposed bottom of excavation.

3. The Contractor shall maintain the water level below the bottom of excavation in the various work areas continuously. The Contractor’s proposed method of dewatering, if required, shall be approved by the Engineer.

4. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, and be

pumped or drained by gravity from the excavation to maintain a bottom free from standing water.

5. The Contractor shall take all additional precautions to prevent uplift of any structure during construction. All such arrangements shall be subject to the approval of the Engineer.

6. Drainage shall be disposed of in an approved area only so that flow or seepage back into the excavated area will be prevented.

7. Floatation shall be prevented by the Contractor by maintaining a positive and continuous removal of water. The Contractor shall be fully responsible and liable for all damages that may result from failure to adequately keep excavations dewatered.

8. Removal of dewatering equipment, if required, shall be accomplished after the system is no longer required; the material and equipment constituting the system shall be removed by the Contractor.

PART 2 – PRODUCTS

2.1 MATERIALS

A. General

1. Excess materials which have been excavated and stockpiled in selected areas on the site which meet the Specifications shall be used as much as possible for fills.

2. For both materials obtained on site and for materials obtained off-site, the Contractor shall notify the Engineer of the source of the material and shall furnish the Engineer for approval, a representative sample weighing approximately 25 kilograms, at least ten calendar days prior to the date of anticipated use of such material. Samples shall be resubmitted as required until approval is obtained.

B. Fill

1. Common Fill

Common fill may be obtained from on-site excavated material if approved by the Engineer or from off-site sources. Common fill shall consist of mineral soil, substantially free of clay, organic material, loam, wood, trash, and other objectionable material which cannot be compacted properly.

Common fill shall not contain broken concrete, masonry, rubble, asphalt pavement, or other similar materials. It shall have physical properties such that it can be readily spread and compacted during filling.

Common fill shall not contain stones larger than 250mm in any dimension, nor stones larger than 150mm in the upper 0.50 meter of fill. Not more than 30% shall pass a No. 200 sieve. The liquid limit of the fraction passing a No. 40 sieve shall not exceed 50%.

2. Structural Fill

Structural fill shall be furnished and placed as required to replace materials encountered and found unsuitable below foundation elevation of structures; or when foundation elevation is set above existing grade as shown on the plans or directed by the Engineer in writing. Structural fill shall be used below all structures that have under drains as shown on the Drawings.

Structural fill shall consist of suitably graded clean sands or gravel-sand mixtures belonging to Group Symbol SW or GW of the Unified Soil Classification, ASTM D2487. Particles shall be sound and not more than 15% shall pass the No. 200 sieve, nor more than 50%, the No. 40 sieve.
The composite material shall be non-plastic and free from organic matter, clay lumps, or other deleterious materials.

3. Granular Fill

Granular fill material shall consist of hard, durable, free draining sand and gravel or hard stone; shall be free from organic matter or other deleterious substances and shall be reasonably well-graded within the following limits:

Size	Percent by Weight Passing
75mm (3 in.)	100
0.60mm (No. 30)	0-20
0.15mm (No.100)	0-5

4. Screened Gravel

Screened gravel shall consist of hard, durable, rounded or sub-angular particles of proper size and gradation, and shall be free from sand, loam, clay, excess fines, and deleterious materials. Screened gravel shall be graded within the following limits:

Sieve Size	Percent by Weight Passing
16mm (5/8 in.)	100
13mm (1/2 in.)	40-100
10mm (3/8 in.)	15-45
2.0mm (No. 10)	0-5

PART 3 - EXECUTION

3.1 STRIPPING AND GRUBBING

Before any fills are placed or any paving or construction started, the area of all such work shall be stripped and grubbed of all top organic materials to a minimum depth of 150mm. Any weak, loose, soft, spongy, or otherwise unsuitable materials shall be removed from the site, and may be deposited in a spoil area, as directed by the Engineer, but shall not be used in any on-site fills.

3.2 EXCAVATION

Excavation shall include, without classification, the removal of all materials of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the Work. The removal of said materials shall conform to the lines and grades shown on the Drawings.

The Contractor shall furnish, place, and maintain all supports and shoring that may be required for the sides of the excavations, and all pumping, ditching, or other approved measures for the removal or exclusion of water, including taking care of storm water reaching the site of the Work from any source so as to prevent damage to the Work or adjoining property.

Excavations shall be sloped or otherwise supported in a safe manner in accordance with the latest applicable safety requirements of the Department of Public Works and Highways and as approved by the Engineer.

A. Excavation below Grade

1. If the bottom of any excavation is taken out below the limits specified on the Drawings, or directed by the Engineer, it shall be refilled at the Contractor's expense with concrete, compacted structural fill, or other material satisfactory to the Engineer.

2. Compacted structural fill, when used for refill, shall be placed in not greater than 150mm layers.

B. Structure Excavation

1. Excavation for structures to be founded on base slabs and footings are intended to be carried to undisturbed natural soil of suitable approved bearing capacity. If, upon uncovering and in the opinion of the Engineer, the material at or below the normal grade of excavation as indicated on the Drawings, is unsuitable for the support of structures, such material shall be over excavated and replaced with compacted structural fill. The Contractor will be paid based on unit price established in the Schedule of Bid Prices.

2. Excavation, including removal of rock and boulders, shall be made to such lines and grades as will give suitable room for buildings and structures, for bracing and supporting, pumping and draining, and to the limits indicated on the Drawings. The bottom of the excavations shall be rendered firm and dry and in all respects acceptable to the Engineer.

3. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of subgrade soils. Subgrade soils which become soft, loose, "quick", or otherwise unsatisfactory for support of structures as a result of inadequate excavation, dewatering or other construction methods, shall be removed and replaced by compacted structural fill at the Contractor's expense.

4. Dewatering shall be such as to prevent boiling or detrimental under seepage at the base of the excavation. The Contractor shall install such means as required to preserve the stability of the base of the excavation.

5. Excavating equipment shall be satisfactory for carrying out the work in accordance with the Specifications.

6. When excavation for foundations has reached prescribed depths, the Engineer shall be notified and he will inspect conditions. If materials and conditions are not satisfactory to the Engineer, the Engineer will issue instructions as to the procedures, and if additional costs are involved, adjustments of the Contract will be made on the basis of unit prices agreed upon by the Engineer and the Contractor in accordance with the provisions of the Contract Documents.

C. Miscellaneous Excavation

The Contractor shall perform all the remaining miscellaneous excavation. He shall make all excavations necessary to permit the placing of loam and plants, for constructing roadways, and any other miscellaneous earth excavation.

3.3 FILL AND COMPACTION

A. General

1. Fills shall be placed as shown on the Drawings or as directed by the Engineer. Where embankments are to be placed and compacted on hillsides, or to be placed against existing embankment, or to be built one half at a time, the slopes of original hillsides, existing embankments, or new fill shall be cut into or benched in order to accommodate each layer of new work a horizontal distance of not less than 1.5 meters. Materials thus removed shall be spread and compacted with the new materials.

2. Compaction shall be performed as specified hereinafter for the particular materials and operations:

   a) A pass shall be one complete coverage of the area to be compacted by the rear wheel tire treads or tractor treads in contact with the flat earth surface.

   b) Areas adjacent to structures and other areas inaccessible to a roller or truck shall be compacted with approved mechanical compaction equipment. Compaction of the fill by such means shall be to the same degree of compaction as obtained by other approved equipment. The Engineer may make the necessary tests to determine the amount of compactive effort necessary to obtain equal compaction. The fill compacted by mechanical compactors shall be placed in 150mm layers and thoroughly tamped over the entire surface. Compaction equipment is subject to approval by the Engineer.

3. The surface of filled areas shall be graded to smooth true lines, strictly conforming to grades indicated, and no soft spots or uncompacted areas will be allowed in the Work.

4. Temporary bracing shall be provided as required during filling and backfilling of all structures to protect partially completed structures against all construction equipment loads, hydraulic pressures, and earth pressures.

B. Placing Structural Fill

1. After all unsuitable materials have been stripped and removed, the area to be filled shall be compacted by rolling using pneumatic tire rollers or tandem rollers of capacity approved by the Engineer. Moisture content of the material in situ should be dry to the optimum. The Engineer shall conduct density test on the compacted base. At least 95% of modified proctor maximum density (ASTM D1557, Method C) must be attained.

2. Fill shall be spread by graders or bulldozers and compacted in layers not thicker than 150mm.
3. Compacted structural fill shall be placed and compacted as specified laterally to the limits defined by a 1 on 1 line sloped outward and downward from a point at least 0.7 meters outside the bottom edge of all footings.
4. Water shall be added by means of sprinklers to each layer in amounts that will bring the fill material to its optimum density. Compaction will not be permitted on completely dry materials.

5. A minimum of two coverage is required for each layer. The Engineer may, during the progress of the work, conduct tests as to the degree of compaction of the fill and may require additional passes when density of the fill has not reached 95% of modified proctor dry density (ASTM D1557, Method C).

6. In areas inaccessible to the large rollers, hand-held tampers shall be used in which case, maximum layer heights shall be 0.15 meter when compacted or as required to achieve 95% of modified proctor dry density.

C. Backfilling – Common Fill

1. Common fill may be used as backfill against the exterior walls of structures or in other areas as designated by the Engineer. Common fill materials shall be placed in layers having maximum thickness of 300mm measured before compaction. Moisture content of the material at the start of compaction shall be at or near optimum.

2. Common fill shall be compacted to at least ninety per cent of maximum density as determined by ASTM D698.

3. Materials placed in fill areas shall be deposited to the lines and grades shown on the Drawings, making due allowance for settlement of the material and for the placing of loam thereon.

4. The surfaces of filled areas shall be graded to smooth true lines, strictly conforming to grades indicated on the grading plan. No soft spots or uncompacted areas will be allowed in the Work.

5. No compaction shall be done when the material is too wet either from rain or from excess application of water.

3.4 GRADING

A. Grading in preparation for placing of loam, planting areas, paved walks and roadways, and appurtenances shall be performed at all places that are indicated, to the lines, grades, and elevations shown on the Drawings or as directed by the Engineer. All material encountered of whatever nature within the limits indicated, shall be removed and disposed of. During the process of grading, the sub-grade shall be maintained in such condition that it will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water that may affect the condition of the Work.

B. If at the time of grading, it is not possible to place any material in its proper section of the permanent structure, it shall be stockpiled in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.

C. The right is reserved to make minor adjustments or revisions in lines or grades, if found necessary as the work progresses, due to discrepancies on the Drawings or in order to obtain satisfactory construction.

D. Stones or rock fragments larger than 100mm in their greatest dimensions will not be permitted in the top 150mm of the finished sub-grade of all fills or embankments.

E. In cuts, all loose or protruding rocks on the back slopes shall be barred loose or otherwise removed to line or finished grade of slope. All cut and fill slopes shall be uniformly dressed to the slope, cross section, and alignment shown on the Drawings, or as directed by the Engineer.

3.5 DISPOSAL OF UNSUITABLE/SURPLUS MATERIALS AND ROCKS

A. Unsuitable excavated materials shall be removed from the immediate site of work and disposed of by the Contractor on the Owner's land as directed by the Engineer.

B. Suitable excavated material may be used for fill or backfill, if it meets the specifications for common fill. Excavated material so approved may be neatly stockpiled at the site where designated by the Engineer provided there is an area available that will not inconvenience traffic or adjoining property owners. If space limitations do not permit stockpiling on the site, the Contractor will be required to make arrangements for off-site stockpiling. Transport of such material from and to the immediate site, including any stockpiling agreements, shall be entirely at the Contractor's expense and shall not constitute grounds for additional payment.

C. Surplus excavated material shall be used to fill depressions or other purposes as the Engineer may direct.

D. The Contractor shall remove and dispose of all pieces of rock which are not suitable for use in other parts of the Work. Rock disposed of by hauling away to spoil areas is to be replaced by approved surplus excavation obtained elsewhere on the Work, insofar as it is available. Any deficiency in the backfill material shall be made up with acceptable material approved by the Engineer.

E. Fragments of ledge and boulders smaller than 25kgs.weight may be used in backfilling trenches and other deep fills. If, in the opinion of the Engineer, the quantity is excessive, he may order the removal and disposal of some of this rock. The small pieces of rock used as backfill shall not be placed in trenches until the pipe has at least 0.7 meters of earth over it. The Contractor shall place these pieces of stone in thin layers, alternating them with earth to be sure that all voids between the stones are completely filled with earth to prevent the occurrence of voids and settlement which will result there from.

F. Rock may be used for fill only with the approval of the Engineer.

3.6 COMPACTION/FIELD DENSITY TESTS

Field density tests shall be performed in accordance with the test procedure specified in ASTM D1556.

The location and frequency of field tests shall be at the discretion of the Engineer. Necessary tests shall be performed by the Engineer for acceptance of a compacted layer before attempting to place new fill material. Any layer or portion thereof that does not meet minimum compaction requirements shall be reworked and re-compacted until it meets the specified density requirements as determined by the Engineer.

**** END OF SECTION ****

SECTION 03150
CONSTRUCTION JOINTS

PART 1 – GENERAL

1.1 SCOPE OF WORK

The Work includes furnishing all materials, labor, equipment and incidentals required to make all concrete joints tight as detailed on the Drawings.

1.2 RELATED SECTIONS

Other Sections of the Specifications shall also apply to the extent required for proper performance of this Work.

Section 33009	Concrete Reinforcement
Section 33010	Concrete Finishes

1.3 SPECIFICATIONS AND STANDARDS

Except as otherwise indicated, the current editions of the following Standards apply to the WORK of this Section:

ASTM D412	Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension
ASTM D746	Brittleness Temperature of Plastics and Elastomers by Impact
ASTM D1752	Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D2240	Rubber Property – Durometer Hardness

1.4 SUBMITTALS *(to be submitted during implementation stage)*

A. Detailed working drawings.
B. Samples/test reports/certificates as required by the applicable Reference Standards.

1.5 QUALITY ASSURANCE

The Contractor is responsible for the performance of all tests and inspection required by this Standard Specification. However, the owner reserves the right to perform any or all prescribed tests and inspection where such is deemed necessary to ensure that delivered materials conform to the specifications, and to be paid for by the Contractor. The Contractor shall furnish the owner certified copies of records showing that each material has been pre-tested, and complied with all applicable requirements of this Standard. The Contractor shall, at his own expense, replace all rejected materials for failure to comply with this Specification.

PART 2 - EXECUTION

2.1 INSTALLATION

- Construction joints shall be provided as indicated on the Drawings. Unless otherwise indicated on the Drawings, bonding will be required at all horizontal joints in walls. Surfaces shall be prepared in accordance with Section 33010.

- Construction joints will be permitted at locations other than those indicated on the Drawings provided, a written permission from the Engineer is obtained.

- The surfaces of the groove for the rubber sealant shall not be coated with curing compound.

- Where indicated on the Drawings, joint sealant shall be placed in all joints to the depth shown. Cleaning of the grooves, priming, handling and application of the materials, including bond breaker, shall be as recommended by the manufacturer.

- Waterstops for all joints shall be continuous around the corners and intersections, either in horizontal or vertical direction, as indicated on the Drawings. Field splices and joints shall be made in accordance with the waterstop manufacturer's instructions, using a thermostatically controlled heating iron.

- Holes for steel tying wires shall be drilled in the waterstops as recommended by the manufacturer.

- Steel tying wire shall be as specified in Section 33009, Concrete Reinforcement.

- A sufficient number of wire ties shall be installed to ensure that the waterstops remain in their original position during the placement of concrete.

**** END OF SECTION ****

SECTION 03200
CONCRETE REINFORCEMENT

PART 1 – GENERAL

1.1 SCOPE OF WORK

The WORK includes fabrication and installation of all steel bars and steel tie wire, clips, supports, chairs, and spacers required for the reinforcement of concrete as shown on the Drawings.

1.2 RELATED SECTIONS

Not Used

1.3 SPECIFICATIONS AND STANDARDS

Except as otherwise indicated, the current editions of the following Standards apply to the WORK of this Section:

ASTM A82	Steel Wire, Plain, for Concrete Reinforcement
ASTM A615	Deformed and Plain Billet – Steel Bars for Concrete Reinforcement
PNS 49	Philippine National Standard – Steel Bars for Concrete Reinforcement

1.4 SUBMITTALS *(to be submitted during implementation stage)*

A. Detailed working drawings and bending schedules of all reinforcement.
B. Samples and test certificates as required by the applicable Reference Standards.

1.5 QUALITY ASSURANCE

The Contractor is responsible for the performance of all tests and inspection required by this Standard Specification. However, the owner reserves the right to perform any or all prescribed tests and inspection where such is deemed necessary to ensure that delivered materials conform to the specifications, and shall be paid for by the Contractor. The Contractor shall furnish the owner certified copies of records showing that each material has been pre-tested, and complied with all applicable requirements of this Standard. The Contractor shall, at his own expense, replace all rejected materials for failure to comply with this Specification.

PART 2 – PRODUCTS

2.1 MATERIALS

Reinforcement steel shall be deformed, new billet steel bars conforming to ASTM A615, Grade 60 and 40, substantially free from mill scale, rust dirt, grease or other foreign matter.

Chemical Composition: The percentages of carbon, manganese, phosphorus, sulfur and silicon on finished bars shall conform to the specified values in PNS 49 as shown in Table 2.

Rail – steel bars will not be permitted in the Work.

Table 2 – Chemical Requirements

Element	Chemical Composition, Pecent Maximum	
	Hot-Rolled Non-weldable Deformed Steel Bar	Hot-Rolled Weldable Deformed or Plain Steel Bar
Carbon	-	0.38
Manganese	-	1.26
Phosphorus	0.0625	0.058
Sulfur	0.0625	0.058
Silicon	-	-

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

Steel wire for tying reinforcing bars and waterstops shall conform to ASTM A82.

The following reinforcing steel bar sizes shall be used for all reinforced concrete design under this Contract.

Bar Designation	Approximate Cross Sectional Area (mm^2)	Approximate Unit Weight (kg/m)
#10	78	0.616
#12	113	0.888
#16	201	1.579
#20	314	2.466
#25	492	3.854
#28	615	4.833
#32	804	6.313
#36	1018	7.991

Should the Contractor wish to use reinforcing steel bars having areas different from those shown (with consequent different designations), the following requirements shall apply:

- If the proposed substitute bar has an area from 97% to 105% of the designated bar, a direct substitution may be made without changes to bar spacing.

- If the proposed substitute bar has an area less than 97% of the designated bar, substitution may be allowed provided bar spacing is reduced to not less than the minimum clear distance between bars.

- If the proposed substitute bar has an area more than 105% of the designated bar, changes in spacing is limited to a maximum spacing of 300mm. All proposed changes shall be submitted to the Engineer for approval.

- Changes shall be implemented upon approval by the Engineer of the reinforcing arrangement Drawings, required as shop drawings, which shall be finalized upon issuance by the Engineer of the guidelines on related criteria, as maximum and minimum spacing and bond strength.

- Approval by the Engineer of bar size substitutions does not relieve the Contractor of other specified requirements, including steel grade and bar deformations.

PART 3 - EXECUTION

3.1 FABRICATION OF REINFORCEMENT

Reinforcement steel shall be accurately fabricated to the dimensions shown on the shop drawings and bar schedules.
All reinforcing bars shall be bent cold around a pin with a free revolving collar having a diameter of the bar of not less than the following:

- Two times for stirrups
- Six times for bars up to and including 25mm diameter
- Eight times for bars over 25mm diameter

Reinforcement steel shall not be straightened nor rebent. Bars with kinks or bends not shown on the Drawings will not be accepted.

3.2 INSTALLATION OF REINFORCEMENT

All reinforcing bars shall be accurately placed as shown on the Drawings, and in accordance with the shop drawings and bar schedules. The reinforcing bars shall be secured against displacement with annealed iron wire ties of minimum 1.0mm diameter or suitable clips at the intersections.

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

• Concrete placed directly on earth	75 mm
• Formed surfaces in contact with the soil, water or exposed to the weather	75 mm
• Concrete cover of main reinforcement steel for columns and beams	40 mm

No reinforcing bars shall be welded.

All reinforcing bars in slabs shall be supported on concrete cubes or chairs of the correct height, containing soft steel wires embedded therein for fastening to the reinforcement steel. Such spacers or chairs shall have a minimum compressive strength of 24 MPa.

Reinforcing bars for vertical surfaces in beams, columns and walls shall be properly and firmly positioned from the forms by means of stainless steel (tipped) bolsters or other equal methods approved by the Engineer.

Reinforcement steel projecting from structures that are to be concreted or where concrete has already been poured shall not be bent out of its correct position.

**** END OF SECTION ****

SECTION 03300
CONCRETE

PART 1 – GENERAL

1.1 SCOPE OF WORK

The WORK includes furnishing all labor, materials, equipment and incidentals necessary for the construction of all concrete work.

1.2 RELATED SECTIONS

Other Sections of the Specifications shall also apply to the extent required for proper performance of this Work.

Section 33009	Concrete Reinforcement
Section 33010	Concrete Finishes
Section 33011	Construction Joints

1.3 SPECIFICATIONS AND STANDARDS

Except as otherwise indicated, the current editions of the following Standards apply to the WORK of this Section:

ASTM C31	Making and Curing Concrete Test Specimens in the Field
ASTM C33	Concrete Aggregates
ASTM C39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C42	Obtaining and Testing Drilled Cores and Sawed Beams
ASTM C94	Ready-mixed Concrete
ASTM C143	Slump of Hydraulic-Cement Concrete
ASTM C150	Portland Cement
ASTM C347	Recommended Practice for Concrete Formwork, US Corps of Engineers CRD C-572
ASTM C494	Chemical Admixtures for Concrete
ASTM C805	Rebound Number of Hardened Concrete

1.4 SUBMITTALS *(to be submitted during implementation stage)*

A. Samples as required by the applicable Reference Standards and in accordance with Part 3 – EXECUTION of this Specification.

1.5 QUALITY ASSURANCE

The Contractor is responsible for the performance of all tests and inspection required by this Standard Specification. However, the owner reserves the right to perform any or all prescribed tests and inspection where such is deemed necessary to ensure that delivered materials conform to the specifications, and shall be paid for by the Contractor. The Contractor shall furnish the owner certified copies of records showing that each material has been pre-tested, and complied with all applicable requirements of this Standard. The Contractor shall, at his own expense, replace all rejected materials for failure to comply with this Specification.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Cement: Cement shall be Portland Cement conforming to ASTM C150, Type II, as follows:

Table 1- Physical Requirements of Cement

Test	Requirement
Compressive Strength for ages indicated, min. 3 days 7 days	 12.0 MPa 19.0 MPa
Time Setting by Vicat Method Initial Set, minimum Final Set, maximum	 45 minutes 375 minutes
Fineness, by turbidimeter test, minimum	160 m²/kg

B. Aggregates

1. Fine Aggregate: Fine aggregate shall be washed inert natural sand conforming to ASTM C33, and shall range in size from coarse to fine within the following limits of US Standard sieve sizes:

Table 2- Grading Requirements for Fine Aggregates

Sieve Designation	Percent (%) Passing
9.5 mm (3/8)	100
4.75 mm (No. 4)	95-100
2.36 mm (No. 8)	80-100
1.18 mm (No. 16)	50-85
0.60 mm (No. 30)	25-60
0.300 mm (No. 50)	5-30
0.150 mm (No. 100)	0-10
0.075 mm (No. 200)	0-3

2. Coarse Aggregate: Coarse aggregate shall be well graded crushed stone or washed gravel conforming to ASTM C33, size No. 67 as follows:

Table 3 – Grading Requirements for Coarse Aggregates

Sieve Designation	Weight Percent (%) Passing
25 mm (1”)	100
19.0 mm (3/4)	90-100
9.5 mm (3/8)	20-55
4.75 mm (No. 4)	0-10
2.36 mm (No. 8)	0-5
0.075 mm (No. 200)	0-1

3. Water: Water used in mixing, curing or other designated application shall be reasonably clean and free of oil, salt, acid, alkali, grass or other substances injurious to the finished product.

4. Admixtures

   - Admixtures conforming to ASTM C494 may be used upon approval of the Engineer in writing, to control the time setting, to effect water reduction and to increase workability. Proportioning and mixing shall be as recommended by the manufacturer.

   - The admixture may be a hydroxylated carboxylic acid type or a hydroxylated polymer type, but shall contain no calcium chloride. The use of an admixture shall not change the required quantities of cement specified under Table 4 of this Section.

   - The total air entrained measured at the discharge from the truck shall be 3.0 per cent maximum for finished slabs and 3.5 to 5.0 per cent for all other concrete.

2.2 QUALITY OF CONCRETE

A. Before placing any concrete, the Contractor shall discuss with the Engineer the source of materials and concrete he proposes to use. Samples of aggregate and cement shall be furnished to the Engineer for testing.

B. The Contractor shall submit to the Engineer, his proposed design mix for evaluation.

C. Compressive strength, water-cement ratio and cement factor specified in Table 4 shall apply for regular and pumped concrete:

Table 4 – Concrete Quality Requirements

Test	Requirements	
	Concrete Fill	All Structural Concrete
Minimum Compressive Strength at 28 days (Mpa)	17.0	21.0 – 42.0
Maximum Net Water Content (liters/100kg cement)	62.0	53.0
Minimum Cement Content (kg/m³)	260	330
Total Air Content (%)	3.5 – 5.0	3.5 – 5.0
Concrete Temp., Max. (°C)	32	32

D. Consistency of the concrete as measured in accordance with ASTM C143 shall be as shown in Table 5.

No excessively wet concrete will be permitted. Concrete delivered to the site having a slump more than that specified herein will be rejected.

Table 5 – Concrete Consistency

Type of Structure	Slump (mm)	
	Recommended	Range
Pavement and Slabs on Ground	50	25 – 75
Plain footings, gravity walls, slabs and beams	50 – 75	25 – 100
Heavy reinforced foundation walls and footings	75 – 100	50 – 125
Thin reinforced walls and columns	100	75 – 125

2.3 FORMS

A. Forms shall be made of either steel or new lumber approved by the Engineer and shall be free from roughness and imperfections, substantially watertight, adequately braced and tied to prevent movement when concrete is placed and vibrated. No wooden spreaders will be allowed in the concrete. Forms shall be thoroughly cleaned before using and shall be treated with non-staining oil or other approved material and allowed to dry before placement of the reinforcing steel.

B. Form ties in concrete exposed to view shall be the cone-washer type. Throughbolts or common wire shall not be used for form ties.

C. Molding or bevels shall be built into the forms to produce a 20-mm chamfer on all exposed projecting corners.

D. Forms for walls shall have removable panels at the bottom for cleaning, inspection and scrubbing-in of bonding paste.

PART 3 - EXECUTION

3.1 MIXING CONCRETE

A. Ready-mixed or transit-mixed concrete shall conform to ASTM C94. The concrete supplier shall furnish to the Engineer for his approval, the dry proportions to be used, with evidence that these will produce concrete of the quality specified.

B. Ready-mixed or transit-mixed concrete shall be transported to the site in watertight agitator or mixer trucks. Discharge at the site shall be within one (1) hour after the cement was first introduced into the mix. Retempering (i.e. mixing with or without additional cement, aggregate or water) of the concrete which has partially hardened, will not be permitted.

3.2 PLACING OF CONCRETE

A. All debris, dirt and water shall be removed from the forms. Forms, reinforcement steel, pipes, conduits, sleeves, anchors and other embedded items shall be inspected and approved by the Engineer before placing any concrete. The Contractor shall advise the Engineer of his readiness to proceed at least 12 hours before each placement of concrete.

B. The surfaces of previously placed concrete, such as vertical or horizontal construction joints, shall be roughened, cleaned of foreign matter and laitance, and saturated with water.

Immediately before the new concrete is placed, all hardened surfaces shall receive a thorough coating of neat cement grout at least 5 mm thick which shall be well scrubbed in by means of stiff bristle brushes. The new concrete then shall be placed before the grout sets up.

Concrete shall be uniformly placed during the process of depositing until the completion of the layer to maintain an approximately horizontal plastic surface. The rate of placing concrete in forms shall not exceed o.60 meter of vertical rise per hour. The spreading of mounds of concrete with vibrator or by shoveling will not be permitted.

C. Concrete shall not be placed in water or stay submerged within 24 hours after placing, except for curing nor shall running water be permitted to flow over concrete surfaces within four days after the placing of concrete.

D. Chutes for conveying concrete shall be of U-shaped metal and provided with a baffle plate at the end. Chutes shall be placed at an angle of not less than 25 degrees, nor more than 45 degrees from horizontal and shall be kept clean and free from hardened concrete. Maximum length of chute to be traveled by plastic concrete shall not be more than 1.50 meters.

E. In thin walls or columns of considerable height, the concrete shall be placed in such a manner as to prevent segregation and accumulation of hardened concrete on the forms or the reinforcement steel located above the concrete mass. Free fall of concrete shall not be permitted to exceed 1.50 meters below the ends of hoppers, chutes, ducts, tremies, or “windows” in wall forms, without approval of the Engineer.

F. Where waterstop type construction joints are provided, the concrete shall be properly worked by rodding and vibrating around the waterstops to produce

watertight joints, before any concrete is poured on the upper surfaces, particularly in the case of horizontal waterstops in slabs.

Waterstops shall be accurately positioned and securely held in place, and shall be protected at all times to prevent damage or displacement. Any damage to, or displacement of waterstops shall be corrected by the Contractor to the satisfaction of the Engineer.

3.3 TAMPING AND VIBRATING

A. During and immediately after placing the concrete, compaction shall be carried out by experienced operators using high-speed internal mechanical vibrators. Care shall be taken to ensure that vibration is continued long enough to produce optimum consolidation without segregation of the aggregates or migration of air.

B. At least one vibrator shall be used for every eight cubic meters of concrete placed per hour. One spare vibrator in operating condition shall be available on the site.

C. Vibrators shall be supplemented with proper wooden spade, puddling adjacent to forms and rodding around embedded fixtures, to remove trapped air bubbles and to prevent honeycombing.

3.4 CURING AND PROTECTION

A. All concrete work shall be properly cured. Details of the Contractor's curing procedures and curing compounds intended to be used shall be subject to the approval of the Engineer.

B. All exposed surfaces including finished surfaces shall be treated immediately after concrete has been poured, to provide continuous moist curing for at least 7 days. Walls and vertical surfaces may be covered with continuously saturated burlap or kept moist by other approved means. Horizontal surfaces, slabs, etc. shall be ponded to a depth of 15mm or kept continuously wet by means of sprinklers or other approved methods.

C. Formed surfaces shall be thoroughly soaked with water at least twice each day until the forms are removed. Curing shall continue as specified above.

D. Where finishing of concrete surfaces is performed before the end of the curing period, the concrete shall not be permitted to dry out and shall be kept continuously damp by means of a fog of water from the time the concrete has been placed until the end of the curing period.

E. The Contractor shall protect all concrete work against injury from the elements and defacements of any nature during construction operations.

3.5 REMOVAL OF FORMS

A. The Contractor shall not remove any forms for at least 48 hours or until the concrete has attained a strength of at least 30 per cent of the ultimate 28- day strength. This is equivalent to approximately 50-day-degrees of moist curing. Day degree represents the total number of days times the average daily air temperature in °C at the surface of the concrete, e.g. 2 days at an average temperature of 25°C equals 50 day-degrees.

B. Forms for beams and slabs shall not be stripped for at least 150-day degrees and supports shall not be removed until the concrete has attained at least 60% of the

specified 28-day strength and is capable of safely supporting its own weight. Construction live loads shall not be placed upon it until the concrete has attained its specified 28-day strength.

C. Removal of forms shall be in accordance with ACI – 347. Forms shall be stripped such that they will not damage the concrete. No forms shall be removed until the concrete has gained sufficient strength to support itself. The Contractor is responsible for the safety of all structures.

3.6 REPAIR OF DEFECTIVE CONCRETE

A. Defective or honeycombed areas, as determined by the Engineer, shall be chipped down to at least 25mm deep into sound concrete by means of chisels or chipping hammers. If honeycombs exist around reinforcement steel a clear space, at least 10mm wide shall be chipped all around the steel.

B. For areas less than 40mm deep, the patch may be made as in filling form-tie holes.

C. Thicker repairs will require build-up in successive 40mm deep layers on successive days, and each layer shall be applied with neat cement pastes.

D. For very deep patches, a non-shrink aggregate, with or without the addition of pea gravel, may be the used subject to the approval of the Engineer.

E. The materials shall be mixed as recommended by the manufacturer of the non-shrink aggregate or as directed by the Engineer.

Where a metallic non-shrink aggregate is utilized, the final 15mm of the patch shall be composed of 1 to 1-1/2 cement / sand mortar without the non-shrink aggregate to prevent rust staining of the surface. After hardening, the patch shall be rubbed as for filling form-tie voids, in accordance with Section 33010, Rubbed Finish.

F. All exposed concrete surfaces and adjoining work stained by spilling or leakage of concrete shall be cleaned to the satisfaction of the Engineer.

3.7 INSPECTION

Installation of reinforcing steel, pipes, sleeves, anchors and other embedded items, batching, mixing, transportation, placing, curing and finishing of concrete shall at all times be subject to the inspection of the Engineer. No concrete shall be placed without the prior approval of the Engineer.

3.8 FIELD CONTROL

A. Sets of six (6) cylinder specimens shall be taken at random by the Contractor in the presence of the Engineer in accordance with ASTM C31. One (1) set per 50 cubic meters of concrete, or fraction thereof, poured during the day shall be made for the compressive strength test. At least one set of samples for strength test shall be made for each class of concrete.

B. Two (2) cylinders shall be tested after 7 days and two cylinders after 28 days. Should the average strength of the 28-day test specimens be less than the specified value, a verification test shall be conducted on the remaining two (2) cylinder samples, after 28 to 45 days. Compressive tests shall be in accordance with ASTM C39 and shall be performed by a laboratory engaged by the Owner. Testing fees shall be paid by the Contractor.

C. The Contractor shall assist, cooperate and provide the concrete for the test cylinders and such auxiliary personnel and equipment needed to take the test specimens.

D. Ready-mixed concrete shall be sampled and tested in accordance with the following methods.

Table 9 – Sampling and Test Methods for Ready-Mixed Concrete

Sampling/Test Method	Applicable ASTM Standard
Compressive Test Specimens	C31
Compression Tests	C39
Yield, Unit Weight	C138
Air Content	C138/C173/C231
Slump	C143
Sampling Fresh Concrete	C172
Temperature	C1064

3.9 FIELD TESTING

A. Should the average strength of the verification test specimens be less than the specified value, the Engineer may take further core samples from the portion of the structure which was determined by the Engineer to represent the deficient 28-day/verification test specimens.

B. If the strength of any core samples is less than the minimum requirements shown in Table 4, the Contractor shall strengthen or replace the portions of the structure concerned at no additional cost and to the satisfaction of the Engineer.

C. The Contractor shall also deduct from payments otherwise due to him, the actual cost to the Owner for taking all core samples extracted from that portion of the Work.

D. Slump tests, temperature and entrained air measurements shall be made when specimens for strength tests are taken and during placement of concrete, as often as necessary for control checks. If measured slump or air content falls outside the specified limits, a check test shall be made immediately on another portion of the same composite sample. In the event of a second failure, the concrete shall be considered to have failed the requirements of the specification and the whole batch shall be rejected.

3.10 BASIS OF ACCEPTANCE / REJECTION

Final acceptance of all concrete will be based on satisfactory results of compressive strength tests.

Strength tests representing each class of concrete must meet the following two requirements:

- The average of any three consecutive strength tests shall be equal to, or greater than the specified strength.

- No individual strength strength test shall be more than 15% below the specified strength.

Except as provided below, acceptance criteria will be as outlined in ASTM C94 and ACI 318. Concrete which achieves the required compressive strength will be accepted as satisfactory for payment provided placement, finish and tolerance meet the specified requirements.

Concrete with average strength deficient by not more than fifteen percent (15%) of the required strength may be accepted, subject to cost reduction given in the following schedule:

Per Cent (%) Deficiency In Average Strength	Per Cent (%) of Unit Price Reduction
Less than 3	0
0 to less than 5	15
5 to less than 10	30
10 to 15	40
more than 15	100

Concrete represented by test results wherein the average strength indicated a deficiency of not more than fifteen percent (15%) but with an individual test deficient by more than fifteen percent (15%) will not be eligible for payment but may be accepted or ordered replaced at the discretion of the Engineer.

Concrete represented by compressive strength tests that fail to achieve the required strength as specified, shall be liable to rejection and subsequent removal and replacement.

However, if any strength tests falls below the specified value by more than 15%, or an individual test is deficient by more than 15%, and load carrying capacity has been significantly reduced, tests of cores drilled from the area in question may be required in accordance with ASTM C42, wherein L/D ratio is not less than 1.25 prior to capping. In such cases, three (3) cores shall be taken for each strength test more than 15% below the required value.

If concrete in the structure will be dry under service conditions, cores shall be air dried for 7 days before test and shall be tested dry. If concrete in the structure will be more than superficially wet under service conditions, cores shall be immersed in water for at least 40 hours and be tested wet.

Concrete in an area represented by core tests shall be considered structurally adequate if the average of three (3) cores is equal to at least 85% of the specified strength, and if no single core is less than 75% of the minimum requirement. Additional testing of cores extracted from locations represented by erratic core strength results shall be permitted.

Acceptance and subsequent payment of concrete in question shall be based on the results of such tests, provided the complete operation has been supervised by the Engineer.

Rebound hammer test (ASTM C805) may be carried out by the Contractor prior to drilling core samples from structure in question, but the results of such rebound tests shall not be used as basis for acceptance or rejection of the concrete.

**** END OF SECTION ****

SECTION 03300
EXISTING CONCRETE ENLARGEMENT

PART 1 – GENERAL

1.1 SCOPE OF WORK

The Work includes furnishing all labor, materials, equipment and incidentals necessary for the construction of all concrete retrofitting work.

1.2 RELATED SECTIONS

Other Sections of the Specifications shall also apply to the extent required for proper performance of this Work.

Section 33009	Concrete Reinforcement
Section 33010	Concrete Finishes

1.3 SPECIFICATIONS AND STANDARDS

Except as otherwise indicated, the current editions of the following Standards apply to the WORK of this Section:

ASTM C31	Making and Curing Concrete Test Specimens in the Field
ASTM C33	Concrete Aggregates
ASTM C39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C42	Obtaining and Testing Drilled Cores and Sawed Beams
ASTM C94	Ready-mixed Concrete
ASTM C143	Slump of Hydraulic-Cement Concrete
ASTM C150	Portland Cement
ASTM C347	Recommended Practice for Concrete Formwork, US Corps of Engineers CRD C-572
ASTM C494	Chemical Admixtures for Concrete
ASTM C805	Rebound Number of Hardened Concrete

1.4 SUBMITTALS *(to be submitted during implementation stage)*

A. Samples as required by the applicable Reference Standards and in accordance with Part 3 – EXECUTION of this Specification.

1.5 QUALITY ASSURANCE

The Contractor is responsible for the performance of all tests and inspection required by this Standard Specification. However, the owner reserves the right to perform any or all prescribed tests and inspection where such is deemed necessary to ensure that delivered materials conform to the specifications, and shall be paid for by the

Contractor. The Contractor shall furnish the owner certified copies of records showing that each material has been pre-tested, and complied with all applicable requirements of this Standard. The Contractor shall, at his own expense, replace all rejected materials for failure to comply with this Specification.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Cement: Cement shall be Portland Cement conforming to ASTM C150, Type II, as follows:

Table 1- Physical Requirements of Cement

Test	Requirement
Compressive Strength for ages indicated, min. 3 days 7 days	 12.0 MPa 19.0 MPa
Time Setting by Vicat Method Initial Set, minimum Final Set, maximum	 45 minutes 375 minutes
Fineness, by turbidimeter test, minimum	160 m^2/kg

B. Aggregates

1. Fine Aggregate: Fine aggregate shall be washed inert natural sand conforming to ASTM C33, and shall range in size from coarse to fine within the following limits of US Standard sieve sizes:

Table 2- Grading Requirements for Fine Aggregates

Sieve Designation	Percent (%) Passing
9.5 mm (3/8)	100
4.75 mm (No. 4)	95-100
2.36 mm (No. 8)	80-100
1.18 mm (No. 16)	50-85
0.60 mm (No. 30)	25-60
0.300 mm (No. 50)	5-30
0.150 mm (No. 100)	0-10
0.075 mm (No. 200)	0-3

2. Coarse Aggregate: Coarse aggregate shall be well graded crushed stone or washed gravel conforming to ASTM C33, size No. 67 as follows:

Table 3 – Grading Requirements for Coarse Aggregates

Sieve Designation	Weight Percent (%) Passing
25 mm (1”)	100
19.0 mm (3/4)	90-100
9.5 mm (3/8)	20-55
4.75 mm (No. 4)	0-10
2.36 mm (No. 8)	0-5
0.075 mm (No. 200)	0-1

3. Water: Water used in mixing, curing or other designated application shall be reasonably clean and free of oil, salt, acid, alkali, grass or other substances injurious to the finished product.

4. Admixtures
   - Admixtures conforming to ASTM C494 may be used upon approval of the Engineer in writing, to control the time setting, to effect water reduction and to increase workability. Proportioning and mixing shall be as recommended by the manufacturer.

   - The admixture may be a hydroxylated carboxylic acid type or a hydroxylated polymer type, but shall contain no calcium chloride. The use of an admixture shall not change the required quantities of cement specified under Table 4 of this Section.

   - The total air entrained measured at the discharge from the truck shall be 3.0 per cent maximum for finished slabs and 3.5 to 5.0 per cent for all other concrete.

2.2 QUALITY OF CONCRETE

A. Before placing any concrete, the Contractor shall discuss with the Engineer the source of materials and concrete he proposes to use. Samples of aggregate and cement shall be furnished to the Engineer for testing.

B. The Contractor shall submit to the Engineer, his proposed design mix for evaluation.

C. Compressive strength, water-cement ratio and cement factor specified in Table 4 shall apply for regular and pumped concrete:

Table 4 – Concrete Quality Requirements

Test	Requirements	
	Concrete Fill	All Structural Concrete
Minimum Compressive Strength at 28 days (Mpa)	17.0	21.0 – 42.0
Maximum Net Water Content (liters/100kg cement)	62.0	53.0
Minimum Cement Content (kg/m³)	260	330
Total Air Content (%)	3.5 – 5.0	3.5 – 5.0
Concrete Temp., Max. (°C)	32	32

D. Consistency of the concrete as measured in accordance with ASTM C143 shall be as shown in Table 5.

No excessively wet concrete will be permitted. Concrete delivered to the site having a slump more than that specified herein will be rejected.

Table 5 – Concrete Consistency

Type of Structure	Slump (mm)	
	Recommended	Range
Pavement and Slabs on Ground	50	25 – 75
Plain footings, gravity walls, slabs and beams	50 – 75	25 – 100
Heavy reinforced foundation walls and footings	75 – 100	50 – 125
Thin reinforced walls and columns	100	75 – 125

2.3 FORMS

A. Forms shall be made of either steel or new lumber approved by the Engineer and shall be free from roughness and imperfections, substantially watertight, adequately braced and tied to prevent movement when concrete is placed and vibrated. No wooden spreaders will be allowed in the concrete. Forms shall be thoroughly cleaned before using and shall be treated with non-staining oil or other approved material and allowed to dry before placement of the reinforcing steel.

B. Form ties in concrete exposed to view shall be the cone-washer type. Through bolts or common wire shall not be used for form ties.

C. Molding or bevels shall be built into the forms to produce a 20-mm chamfer on all exposed projecting corners.

D. Forms for walls shall have removable panels at the bottom for cleaning, inspection and scrubbing-in of bonding paste.

PART 3 - EXECUTION

3.1 MIXING CONCRETE

A. Ready-mixed or transit-mixed concrete shall conform to ASTM C94. The concrete supplier shall furnish to the Engineer for his approval, the dry proportions to be used, with evidence that these will produce concrete of the quality specified.

B. Ready-mixed or transit-mixed concrete shall be transported to the site in watertight agitator or mixer trucks. Discharge at the site shall be within one (1) hour after the cement was first introduced into the mix. Retempering (i.e. mixing with or without additional cement, aggregate or water) of the concrete which has partially hardened, will not be permitted.

3.2 PLACING OF CONCRETE

A. All debris, dirt and water shall be removed from the forms. Forms, reinforcement steel, pipes, conduits, sleeves, anchors and other embedded items shall be inspected and approved by the Engineer before placing any concrete. The Contractor shall advise the Engineer of his readiness to proceed at least 12 hours before each placement of concrete.

B. The surfaces of previously placed concrete, such as vertical or horizontal construction joints, shall be roughened, cleaned of foreign matter and laitance, and saturated with water.

Immediately before the new concrete is placed, all hardened surfaces shall receive a thorough coating of neat cement grout at least 5 mm thick which shall be well scrubbed in by means of stiff bristle brushes. The new concrete then shall be placed before the grout sets up.

Concrete shall be uniformly placed during the process of depositing until the completion of the layer to maintain an approximately horizontal plastic surface. The rate of placing concrete in forms shall not exceed o.60 meter of vertical rise per hour. The spreading of mounds of concrete with vibrator or by shoveling will not be permitted.

C. Concrete shall not be placed in water or stay submerged within 24 hours after placing, except for curing nor shall running water be permitted to flow over concrete surfaces within four days after the placing of concrete.

D. Chutes for conveying concrete shall be of U-shaped metal and provided with a baffle plate at the end. Chutes shall be placed at an angle of not less than 25 degrees, nor more than 45 degrees from horizontal and shall be kept clean and free from hardened concrete. Maximum length of chute to be traveled by plastic concrete shall not be more than 1.50 meters.

E. In thin walls or columns of considerable height, the concrete shall be placed in such a manner as to prevent segregation and accumulation of hardened concrete on the forms or the reinforcement steel located above the concrete mass. Free fall of concrete shall not be permitted to exceed 1.50 meters below the ends of hoppers, chutes, ducts, tremies, or “windows” in wall forms, without approval of the Engineer.

F. Where waterstop type construction joints are provided, the concrete shall be properly worked by rodding and vibrating around the waterstops to produce

watertight joints, before any concrete is poured on the upper surfaces, particularly in the case of horizontal waterstops in slabs.

Waterstops shall be accurately positioned and securely held in place, and shall be protected at all times to prevent damage or displacement. Any damage to, or displacement of waterstops shall be corrected by the Contractor to the satisfaction of the Engineer.

3.3 TAMPING AND VIBRATING

A. During and immediately after placing the concrete, compaction shall be carried out by experienced operators using high-speed internal mechanical vibrators. Care shall be taken to ensure that vibration is continued long enough to produce optimum consolidation without segregation of the aggregates or migration of air.

B. At least one vibrator shall be used for every eight cubic meters of concrete placed per hour. One spare vibrator in operating condition shall be available on the site.

C. Vibrators shall be supplemented with proper wooden spade, puddling adjacent to forms and rodding around embedded fixtures, to remove trapped air bubbles and to prevent honeycombing.

3.4 CURING AND PROTECTION

A. All concrete work shall be properly cured. Details of the Contractor's curing procedures and curing compounds intended to be used shall be subject to the approval of the Engineer.

B. All exposed surfaces including finished surfaces shall be treated immediately after concrete has been poured, to provide continuous moist curing for at least 7 days. Walls and vertical surfaces may be covered with continuously saturated burlap or kept moist by other approved means. Horizontal surfaces, slabs, etc. shall be ponded to a depth of 15mm or kept continuously wet by means of sprinklers or other approved methods.

C. Formed surfaces shall be thoroughly soaked with water at least twice each day until the forms are removed. Curing shall continue as specified above.

D. Where finishing of concrete surfaces is performed before the end of the curing period, the concrete shall not be permitted to dry out and shall be kept continuously damp by means of a fog of water from the time the concrete has been placed until the end of the curing period.

E. The Contractor shall protect all concrete work against injury from the elements and defacements of any nature during construction operations.

3.5 REMOVAL OF FORMS

A. The Contractor shall not remove any forms for at least 48 hours or until the concrete has attained a strength of at least 30 per cent of the ultimate 28-day strength. This is equivalent to approximately 50-day-degrees of moist curing. Day degree represents the total number of days times the average daily air temperature in °C at the surface of the concrete, e.g. 2 days at an average temperature of 25°C equals 50 day-degrees.

B. Forms for beams and slabs shall not be stripped for at least 150-day degrees and supports shall not be removed until the concrete has attained at least 60% of the

specified 28-day strength and is capable of safely supporting its own weight. Construction live loads shall not be placed upon it until the concrete has attained its specified 28-day strength.

C. Removal of forms shall be in accordance with ACI – 347. Forms shall be stripped such that they will not damage the concrete. No forms shall be removed until the concrete has gained sufficient strength to support itself. The Contractor is responsible for the safety of all structures.

3.6 REPAIR OF DEFECTIVE CONCRETE

A. Defective or honeycombed areas, as determined by the Engineer, shall be chipped down to at least 25mm deep into sound concrete by means of chisels or chipping hammers. If honeycombs exist around reinforcement steel a clear space, at least 10mm wide shall be chipped all around the steel.

B. For areas less than 40mm deep, the patch may be made as in filling formtie holes.

C. Thicker repairs will require build-up in successive 40mm deep layers on successive days, and each layer shall be applied with neat cement pastes.

D. For very deep patches, a non-shrink aggregate, with or without the addition of pea gravel, may be the used subject to the approval of the Engineer.

E. The materials shall be mixed as recommended by the manufacturer of the non-shrink aggregate or as directed by the Engineer.

Where a metallic non-shrink aggregate is utilized, the final 15mm of the patch shall be composed of 1 to 1-1/2 cement / sand mortar without the non-shrink aggregate to prevent rust staining of the surface. After hardening, the patch shall be rubbed as for filling form-tie voids, in accordance with Section 33010, Rubbed Finish.

F. All exposed concrete surfaces and adjoining work stained by spilling or leakage of concrete shall be cleaned to the satisfaction of the Engineer.

3.7 INSPECTION

Batching, mixing, transportation, placing, curing and finishing of concrete shall at all times be subject to the inspection of the Engineer. No concrete shall be placed without the prior approval of the Engineer.

3.8 FIELD CONTROL

A. Sets of six (6) cylinder specimens shall be taken at random by the Contractor in the presence of the Engineer in accordance with ASTM C31. One (1) set per 50 cubic meters of concrete, or fraction thereof, poured during the day shall be made for the compressive strength test. At least one set of samples for strength test shall be made for each class of concrete.

B. Two (2) cylinders shall be tested after 7 days and two cylinders after 28 days. Should the average strength of the 28-day test specimens be less than the specified value, a verification test shall be conducted on the remaining two (2) cylinder samples, after 28 to 45 days. Compressive tests shall be in accordance with ASTM C39 and shall be performed by a laboratory engaged by the Owner. Testing fees shall be paid by the Contractor.

C. The Contractor shall assist, cooperate and provide the concrete for the test cylinders and such auxiliary personnel and equipment needed to take the test specimens.

D. Ready-mixed concrete shall be sampled and tested in accordance with the following methods.

Table 9 – Sampling and Test Methods for Ready-Mixed Concrete

Sampling/Test Method	Applicable ASTM Standard
Compressive Test Specimens	C31
Compression Tests	C39
Yield, Unit Weight	C138
Air Content	C138/C173/C231
Slump	C143
Sampling Fresh Concrete	C172
Temperature	C1064

3.9 FIELD TESTING

A. If the strength of any core samples is less than the minimum requirements shown in Table 4, the Contractor shall strengthen or replace the portions of the structure concerned at no additional cost and to the satisfaction of the Engineer.

B. The Contractor shall also deduct from payments otherwise due to him, the actual cost to the Owner for taking all core samples extracted from that portion of the Work.

C. Slump tests, temperature and entrained air measurements shall be made when specimens for strength tests are taken and during placement of concrete, as often as necessary for control checks. If measured slump or air content fall outside the specified limits, a check test shall be made immediately on another portion of the same composite sample. In the event of a second failure, the concrete shall be considered to have failed the requirements of the specification and the whole batch shall be rejected.

3.10 BASIS OF ACCEPTANCE / REJECTION

Final acceptance of all concrete will be based on satisfactory results of compressive strength tests.

Strength tests representing each class of concrete must meet the following two requirements:

- The average of any three consecutive strength tests shall be equal to, or greater than the specified strength.
- No individual strength test shall be more than 15% below the specified strength.

Except as provided below, acceptance criteria will be as outlined in ASTM C94 and ACI 318. Concrete which achieves the required compressive strength will be accepted as satisfactory for payment provided placement, finish and tolerance meet the specified requirements.

Concrete with average strength deficient by not more than fifteen per cent (15%) of the required strength may be accepted, subject to cost reduction given in the following schedule:

Per Cent (%) Deficiency In Average Strength	Per Cent (%) of Unit Price Reduction
Less than 3	0
0 to less than 5	15
5 to less than 10	30
10 to 15	40
more than 15	100

Concrete represented by test results wherein the average strength indicated a deficiency of not more than fifteen percent (15%) but with an individual test deficient by more than fifteen percent (15%) will not be eligible for payment but may be accepted or ordered replaced at the discretion of the Engineer.

Concrete represented by compressive strength tests that fail to achieve the required strength as specified, shall be liable to rejection and subsequent removal and replacement.

However, if any strength tests falls below the specified value by more than 15%, or an individual test is deficient by more than 15%, and load carrying capacity has been significantly reduced, tests of cores drilled from the area in question may be required in accordance with ASTM C42, wherein L/D ratio is not less than 1.25 prior to capping. In such cases, three (3) cores shall be taken for each strength test more than 15% below the required value.

If concrete in the structure will be dry under service conditions, cores shall be air dried for 7 days before test and shall be tested dry. If concrete in the structure will be more than superficially wet under service conditions, cores shall be immersed in water for at least 40 hours and be tested wet.

Concrete in an area represented by core tests shall be considered structurally adequate if the average of three (3) cores is equal to at least 85% of the specified strength, and if no single core is less than 75% of the minimum requirement. Additional testing of cores extracted from locations represented by erratic core strength results shall be permitted.

Acceptance and subsequent payment of concrete in question shall be based on the results of such tests, provided the complete operation has been supervised by the Engineer.

Rebound hammer test (ASTM C805) may be carried out by the Contractor prior to drilling core samples from structure in question, but the results of such rebound tests shall not be used as basis for acceptance or rejection of the concrete.

**** END OF SECTION ****

SECTION 03730
CONCRETE REPAIR USING EPOXY RESIN
CONCRETE GROUTS AND MORTARS

PART 1 – GENERAL

1.1 APPLICABLE PUBLICATIONS

The publications listed below form part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1.1 Military Specification

MIL-L-51149	Liquid Polymer, Polysulfide

1.1.2 American Society for Testing of Materials (ASTM) Publications

C 33-81	Concrete Aggregates
C 117-80	Materials Finer than No. 200 Sieve in Mineral Aggregates by Washing
C 136-81	Sieve Analysis of Fine and Coarse Aggregates
C 144-81	Aggregate for Masonry Works
C 881-78	Epoxy-Resin-Base Bonding System for Concrete
D 1652-73	Epoxy Content of Epoxy Resins (R1980)
D 1824-66	Apparent Viscosity of Plastisols and Organosols at Low Shear Rates by Brookfield Viscometer
D 1963-74	Specific Gravity of Drying Oils, Varnishes Resins, and Related Materials at 25/25 Degrees (C).
D 2419-74	Sand Equivalent Value of Soils and Fine Aggregates (R1982)
E 70-77	PH of Aqueous Solutions with the Glass Electrode

1.2 SUBMITTALS *(to be submitted during implementation stage)*

1.2.1 Certified Test Reports

a. Aggregates: Sieve analysis test in accordance with ASTM C136 and ASTM C117.

b. Epoxy Resin Binder: Conforming to ASTM C881 and covering the following:
   1. Viscosity
   2. Consistency
   3. Gel Time
   4. Absorption
   5. Shrinkage

6. Thermal Compatibility

c. Epoxy Resin Binder: Conforming to the two component epoxy resin binder type 1 specified hereinafter and covering the following.
   1. Epoxy Number
   2. Epoxy Viscosity
   3. Epoxy Specific Gravity
   4. Polysulfide Viscosity
   5. Polysulfide Specific Gravity
   6. Polysulfide pH
   7. Polysulfide Water Content
   8. Polysulfide Sulfur Content

1.2.2 Job Mix Formula: Submit for approval at least 15 days before work commences a job-mix formula for each use of epoxy resin. Test reports shall accompany the mix design. The formula shall identify the proposed source of the materials and state the proportions of aggregates and epoxy resin. Samples of materials to be used on the job shall be used to determine the job mix.

1.2.3 Samples: Submit the following samples for approval:

a. Not less than two sample epoxy concrete and epoxy mortar specimens for each mix design, 6-inches, ¾ inch thick.
b. Aggregates, 1-lb sample size, fine and coarse aggregates combined.
c. Epoxy resin components, 1 pint each

1.2.4 Equipment: Submit descriptive information on the mixing and application equipment.

1.3 QUALITY ASSURANCE

The Contractor is responsible for the performance of all tests and inspection required by this Standard Specification. However, the Owner reserves the right to perform any or all prescribed tests and inspection where such is deemed necessary to ensure that delivered materials conform to the specifications, and shall be paid for by the Contractor. The Contractor shall furnish the Owner certified copies of records showing that each material has been pre-tested, and complied with all applicable requirements of this Standard.

PART 2 – PRODUCTS

2.1 MATERIALS

2.1.1 Epoxy Concrete and Epoxy Mortar:

2.1.1.1 Epoxy Resin Binder

2.1.1.1.1 ASTM C 881, Type III, Grade 2, Class C, with a bond strength of 1,400 psi.

2.1.1.1.2 A two-component epoxy resin-base binder of the epoxy resin-polysulfide polymer type with a suitable curing agent. The ratio of epoxy resin to polysulfide polymer shall be approximately 2:1 (by weight). The epoxy binder shall be a 100 percent solids system and no diluents, wetting agents, or volatile solvents shall be incorporated. The epoxy resin

binder shall be Type I and shall conform to the following requirements:

2.1.1.1.2.1 Base Polymer: The base polymer shall be thermosetting resin of the epoxy type and shall be a transluscent liquid having properties as specified herein. The epoxy resin shall be completed of 100 percent reactive constituents, which are condensation products of the reaction of epichlorohydrin with bisphenol A. This product shall be essentially pure liquid dislycidly either ofnbisphenol A and maybe allowed to contain only trace amounts of hydrolyzable chlorine, but no reactive diluents. The epoxy resin or base polymer shall conform to the requirements specified in the Table I.

Table I. Requirements for the Epoxy Resin or Base Polymer

Property	Test Method	Requirements	
		Min.	Max.
Epoxy Number	ASTM D 1652	175	210
Viscosity, Poises at 23C	ASTM D 1824	100	180
Specific Gravity at 25/25 C	ASTM D 1963	1.15	1.18

2.1.1.1.2.2 Polysulfide Polymer. The polysulfide polymer flexibilizer shall be a dichloroethylformal polysulfide in the 1000-molecular weight range conforming to the requirements specified in Table II.

Table II. Requirements for Polysulfide Polymer

Property	Test Method	Requirements	
		Min.	Max.
Viscosity at 23C centipoises	ASTM D 1824	700	1200
Specific Gravity at 25/25 C	ASTM D 1963	1.24	1.30
pH	ASTM E 70	6.0	8.0
Water content, percent	MIL-L-51149	-	0.1
Sulfur content, percent	ASTM D 129	36	40

2.1.1.1.2.3 Curing Agent: The curing agent shall be furnished combined with the polysulfide polymer flexibilizer as the polysulfide-curing agent component. The curing agent used shall be a tertiary amine type. When incorporated in the binder system, the curing agent shall be unaffected by moisture present on the surfaces to which the epoxy resin binder is applied or that moisture present in unhardened Portland cement concrete at the time of placement on the surface of the binder. These agents shall be a combination of 2-, 4-, 6-trimethylaminomethyl phenol and

dimethylaminomethyl phenol. The 2-, 4-, 6-trimethylaminomethyl phenol may be used alone when application condition warrant.

2.1.2.2 Aggregate: Aggregate shall conform to the quality requirements of ASTM C 33 for epoxy concrete and shall have a minimum sand equivalent of 75 percent when tested in accordance with ASTM D 2419. ASTM C 144 for epoxy mortar. The material passing the No. 200 sieve shall be non-plastic and it shall be composed of a minimum of 75 percent limestone dust, talc or silica inert filler.

2.1.2.2.1 For Epoxy Concrete: Maximum size 3/8-inch. Shall conform to the following requirements:

Sieve Designation	Percent Passing by Weight
3/8 in	100
No. 4	70-80
No. 8	50-65
No. 16	37-53
No. 30	20-37
No. 50	10-20
No. 100	5-10
No. 200	3-5

2.1.2.2.2 For Epoxy Mortar: Maximum size: No 8 sieve

2.1.2 Pressure Grouting Epoxy:

2.1.2.1 For Pumping Into Cracks: ASTM 881, Type I, Grade I, Class C.

2.1.3 Bond Breakers : Use the type and consistency recommended by the sealant manufacturer for the particular application.

2.2 EQUIPMENT: The equipment for blending the epoxy resin binder and mixing the binder and aggregates shall be approve by the Engineers. A suitable capacity metal or polyethylene container recommended by the epoxy manufacturer shall be used as the mixing vessel for blending the epoxy resin. Mixing shall be accomplished using a poser drive (air or spark-proof) propeller type blade except that hand mixing maybe used for small batches. Equipment for field mixing of aggregates and epoxy resin shall be as specified by the epoxy manufacturer.

PART 3 – EXECUTION

3.1 CONSTRUCTION PROCEDURES

3.1.1 General: Mix the epoxy materials with or without files in strict accordance with the manufacturer's instruction. All application of the mixed materials shall be performed within the working life or pot life of the epoxy resin system. Unused mixed materials which have reached the end of the working or pot life, shall be removed from the jobsite. Field mixing and size of batch shall determine by the Contractor. Epoxy concrete, epoxy mortar, non-pressure epoxy grout, and

pressure grouting of cracks shall be provided as indicated and required by this specification.

3.1.2 Epoxy Concrete:

3.1.2.1 Preparation of Patch Area: Remove loose concrete from the spalled areas indicated. Inspect the cavity of any remaining defective concrete by tapping with a hammer or steel rod throughout the areas and listening for dull or hollow sounds. In areas where tapping does not produce a solid tone, remove additional concrete until resting produces a solid tone. Use a high frequency chipping hammer or concrete saw to deepened cavity. Make maw cuts a minimum of ½ inch deep at a minimum distance of one inch outside the farthest edge of the spall. Roughen saw cuts surface by sand blasting. Remove residual fines from all surfaces with a high pressure water jet. Remove any free water with an oil free air jet.

3.1.2.2 Spalls at Joint: Spalls to be repaired that are adjacent to all joints and working cracks shall have performed joint filler of proper dimensions inserted to the bottom of the chipped spall cavities and shall be expanded a minimum of one inch beyond (horizontally) the entire working faces of the spall. The filler strip shall be secured in place prior to and during placement of epoxy concrete. A bituminous cement bond breaker shall be applied to all working faces at keyed joints. Care shall be exercised to keep bituminous cement bond breaker off of concrete surface to be bonded. After the epoxy concrete has completely cured, the top inch of the preformed joint filler shall be sawed out and liquid joint sealer installed.

3.1.2.3 Mixing materials: Make batches small enough to assure placement before binder sets.

3.1.2.4 Prime coat: prime all surfaces of the cavity with the epoxy resin binder. Scrub prime coat into the surface with the stiff bristle brush. Make coating approximately 20 mils thick.

3.1.2.5 Epoxy Concrete Preparation: Mix epoxy resin binder and aggregates in accordance with manufacturer’s recommendations.

3.1.2.6 Placement of Epoxy Concrete: Place epoxy in layers not exceeding 2 inches thick. Use vibratory floats, plates, or hand tampers to consolidate the concrete. Level each layer and screed the final surface to match the adjoining surfaces. Remove excess epoxy concrete on adjacent surfaces before concrete hardens. After the finishing operations and while the epoxy resin concrete is still tacky, uniformly spread a thin coating of Portland cement on the surface of the repaired area and lightly brush the cement into the surface. Upon completion of finishing operations, cure epoxy concrete in accordance with the manufacturer’s recommendations.

3.1.3 Epoxy Mortar for cracks and saw Kerfs:

3.1.3.1 Preparation of Area: Concrete to which epoxy mortar is to be applied shall be newly exposed concrete free of loose and unsound materials: Prepare surfaces by sandblasting, scarifying or water blasting. Surfaces shall be dry before application of epoxy mortar.

3.1.3.2 Mixing Materials: Make batches small enough to assure placement before binder sets.

3.1.3.3 Prime Coat: Prime all surfaces with the epoxy resin binder. Scrub prime coat into the surface with a stiff bristle brush. Make coating approximately 20 mils thick.

3.1.3.4 Epoxy Mortar preparation: Mix epoxy resin binder and aggregates in accordance with manufacturer's recommendations.

3.1.3.5 Placement of Epoxy mortar: Apply epoxy mortar to concrete surface by trowel, roller or squeegee at a thickness not less than, nor more than, that recommended by the manufacturer. Work mortar into place and consolidate thoroughly so that all contact surfaces are wet by the feather edge epoxy mortar into adjacent surfaces.

3.1.4 Non-Pressure epoxy Grout: Prepare grout accordance with the manufacturer's instructions.

3.1.4.1 Cement Dowels: Immediately prior to placing dowel clean the hole of dust and other deleterious materials. Fill the hole with grout to a level that leaves enough space for the dowel without overflowing. Insert the dowel in the hole and tap down. If necessary add more grout.

3.1.4.2 Grout Cracks

3.1.4.2.1 Preparation of Area: Concrete to which epoxy grout in to be applied shall be newly exposed concrete free of loose and unsound materials. Prepare surfaces by sandblasting, scarifying or water blasting. Surfaces shall be dry before application of epoxy grout.

3.1.4.2.2 Apply epoxy grout to concrete surface by trowel, roller or squeegee at a thickness not more than 2-inches or as recommended by the manufacturer. Work grout into place and consolidate thoroughly so that all contact surfaces are wet by the grout. Finish surface of grout to the required texture. Do not feather edge epoxy grout into adjacent surfaces.

3.1.5 Pressure Grouting of Cracks: Fill cracks in concrete slabs, beams an by pumping a low viscosity epoxy resin system under pressure into the cracks. Install valves into position along the cracks by bonding in concrete with high viscosity, non-sagging epoxy resin paste mixture. Cracks shall be filled by pumping the low viscosity epoxy system through the valves.

3.1.5.1 Grout out cracks along its entire length to a depth of ¼ inch and a width of 3/8 inch. Vacuum or jet-blow off all dust and particles an the area of the groove.

3.1.5.2 At maximum intervals equivalent to the thickness of the member being repaired or 12 inches and at the juncture of two cracks the bottom of the groove shall be sawed flat and a valve inserted at each interval.

3.1.5.3 The groove between valves shall be filled flush with the concrete surface with the high viscosity epoxy mixture.

3.1.5.4 After the resin mixture has hardened and curved, a tube from a pressure pot containing the low viscosity resin mixture shall be attached t the first valve and the resin mixture pumped into the crack. Use a maximum pressure of 60 psi or less to protect the existing concrete.

3.1.5.5 As the resin mixture appears in the second valve, pinch closed the first valve, and attached the tube from the pressure pot to the second valve and commence pumping. Avoid delays in the pumping operations.

3.1.5.6 After the epoxy mixture has been pumped through all of the valves and the mixture has hardened, removed the valves by grinding off the valves flush with the concrete. Coat the areas of the valves with the high viscosity resin mixture and allow to curve.

3.2 FIELD TESTING AND INSPECTION:

3.2.1 Sampling: As soon as the epoxy resin and aggregate materials are available for sampling, obtain by random selection a sample of each batch in the presence of the Engineer. A batch is defined as that quantity of material processed by the manufacturer at one time and identified by designated name, specification number, batch number, project contact number, intended use and quantity involved.

3.2.2 Testing: At the discretion of the Engineer, samples provided maybe tested for verification.

3.2.3 Inspection: Examine material at the jobsite to determine that it is material referenced in the report o test result or certificate of compliance.

3.2.3.1 Surface preparations and application procedures will be examined by the Engineer to determine conformance with the requirements specified. Approve each separate operation prior to initiation of subsequent operations.

**** END OF SECTION ****

SECTION 04200
MASONRY

PART 1 – GENERAL

1.1 SCOPE OF WORK

The Work includes furnishing all labor, materials, equipment and incidentals required to construct all concrete masonry unit walls including the following:

- Concrete hollow block walls.
- Masonry reinforcing bars for concrete blocks.
- Grouting.
- Connecting wall anchors, ties, bolts and related embedded items.
- Installation of frames for doors, windows, louvers, steel lintels, and recessed fixtures.

1.2 RELATED SECTIONS

Other Sections of the Specifications shall also apply to the extent required for proper performance of this Work.

Section 33030	Cement Plastering
Section 33019	Caulking and Dampproofing
Sections 33020 to 33028	Doors, Windows and Glass

1.3 SPECIFICATIONS AND STANDARDS

Except as otherwise indicated, the current editions of the following Standards apply to the WORK of this Section:

ASTM C33	Concrete Aggregates
ASTM C90	Loadbearing Concrete Masonry Units
ASTM C144	Aggregate for Masonry Mortar
ASTM C150	Portland Cement

1.4 SUBMITTALS *(to be submitted during implementation stage)*

A. Detailed working drawings.
B. Samples as required by the applicable Reference Standards.

1.5 QUALITY ASSURANCE

The Contractor is responsible for the performance of all tests and inspection required by this Standard Specification. However, the owner reserves the right to perform any or all prescribed tests and inspection where such is deemed necessary to ensure that delivered materials conform to the specifications, and shall be paid for by the Contractor. The Contractor shall furnish the owner certified copies of records showing that each material has been pre-tested, and complied with all applicable requirements of this Standard. The Contractor shall, at his own expense, replace all rejected materials for failure to comply with this Specification.

1.6 PROTECTION OF MATERIALS

All perishable materials for the Work of this Section shall be delivered, stored and handled to preclude damage of any nature. Manufactured materials, such as cement, shall be delivered and stored in their original containers, plainly marked with identification of material and maker. Materials in broken containers, or in packages showing watermarks or other evidence of damage, shall not be used and shall be removed from the site.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Cement

Portland cement shall conform to ASTM C150, Type I. Masonry cements shall not be used. One color of cement shall be used throughout the Work. Cement shall be used for the application intended and in accordance with the approved recommendation of the manufacturer.

B. Sand for Mortar

Sand shall be clean, durable particles, free from injurious amounts of organic matter and shall conform to the requirements of ASTM C144, Aggregate for Masonry Mortar.

Sand for grout shall conform to ASTM C144 or C33 as required.

C. Water

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

D. Concrete Hollow Blocks

1. Classification

Concrete block shall conform to ASTM C90, Type I, Normal Weight.

2. Manufacturing Requirements

Concrete hollow blocks shall be manufactured from Portland cement conforming to ASTM C150.

Aggregates for concrete blocks shall consist of sand and evenly graded pea gravel conforming to ASTM C33.

All concrete hollow blocks shall be even textured with straight and true edges, wet steam cured for at least 18 hours and then air cured in covered storage for not less than 28 days before delivery to the job site and shall conform to the requirements of Table 1.

Table 1 – Quality Requirements

Compressive Strength (Minimum, MPa)		Water Absorption (Maximum,kg/m³)	Moisture Content (Maximum, % of Total Absorption)
Average of Five (3) Samples	Individual Sample	Average of Five (3) Samples	Average of Five (3) Samples
7.1	6.9	208	40

The moisture content of hollow blocks when laid shall not exceed 35 per cent.

3. Dimensions

The actual dimensions of the concrete hollow blocks shall be as shown in Table 2.

Table 2 – Dimensions

Nominal Dimension (mm)			*Actual Dimension (mm)		
Width	Height	Length	Width	Height	Length
100	200	400	92	194	397
150	200	400	143	194	397
200	200	400	194	194	397

No average dimension shall differ from the specified actual dimensions by more than 3 mm.

4. Minimum Face Shell and Web Thickness

The following dimensions shown in Table 3 shall apply for minimum face and web thickness.

Table 3 - Minimum Thickness of Face Shells and Webs

Nominal Width mm (in.)	Face Shell Thickness (Minimum, mm)	Web Thickness (Minimum, mm)
102 (4”)	19	19
152 (6”)	25	25
203 (8”)	32	25

2.2 MORTAR MIXES

Masonry mortar for setting blocks shall be in the proportion of 1 part cement to 3 parts sand or as otherwise approved by the Engineer. Mortar shall be mixed with water in an amount compatible with workability. Ingredients shall be accurately measured by volume.

Mixing shall be done immediately before usage. The Contractor shall use the dry-mix method, wherein the materials for each batch shall be well turned together until the cementitious materials has been thoroughly distributed throughout the mass, after

which the water shall be gradually added until a thoroughly mixed mortar of the required plasticity is obtained.
Mortar boxes shall be cleaned out at the end of each day's work and all tools shall be kept clean. Mortar that has begun to set shall not be used.

The mixing of mortar by hand will be permitted only when the quality of hand mixing is comparable to mechanical mixing. The Engineer reserves the right to reject hand mixing and require all mixing by mechanical means. Mortar shall not be retained for more than 1-1/2 hours and shall be constantly mixed until used.

Pointing mortar shall be prehydrated mortar mixed dry, and water added while mixing to obtain a damp, or workable mix. After one or two hours, sufficient water shall be added to bring it to proper consistency, which shall be somewhat drier than masonry mortar.

The color of mortars shall be uniform throughout for adjoining areas, and shall be satisfactory to the Engineer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General

All masonry shall be laid plumb and true to lines. Masonry shall be carried up in a uniform manner. No portion shall be raised more than one meter above adjacent portions, except with the approval of the Engineer.

B. Concrete Hollow Block

Concrete blocks shall be laid in running bond, unless otherwise indicated. Joints shall not exceed 10 mm, shall be uniform throughout, and finished slightly concave and smooth.

Pointing shall be performed with the proper tools to a dense and neat finish. Finger pointing will not be allowed.

All blocks shall be laid in a full bed of mortar applied to shells. Apply mortar to the vertical joint of blocks that have already set in the wall, and to all contact faces of the unit. Each unit shall be placed and shoved against the previously laid block to produce a well-compacted vertical mortar joint for the full shell thickness.

Intersecting bearing walls shall be tied together with metal ties at 0.80-meter vertical spacing. Bends of tie and reinforcing bars shall be embedded in cells filled with mortar.

Concrete blocks shall be reinforced with gage #10 bars at 0.80 meter on centers in vertical and horizontal direction.

- All necessary block cutting shall be neatly done by an approved hand tool.

- Unless otherwise shown on the Drawings, door, window and louver frames shall be installed using screws and expansion shields. All frames shall be set tightly against the masonry wall.

- Control joints shall be installed as detailed on the Drawings. The joints shall be raked out to a depth of 20 mm for the full height of the wall and caulked. The

maximum length between joints shall be 10 meters, if not shown on the Drawings, or as directed by the Engineer.
Joints made at the intersection of block walls with structural concrete, and where indicated, shall be filled with mortar grout and pointed.

C. Concrete Hollow Block to be Plastered

Concrete block walls, which are to be plastered, shall be laid in running bond. Joints are to be left rough to assist in the bonding of plaster. Otherwise, concrete block masonry shall conform to paragraph B, Concrete Hollow Block. Control joints in plastered block walls shall be carried through the plaster, but the joints shall not be plastered.

3.2 LINTELS, TIES AND MICELLANEOUS ITEMS

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

3.3 GROUTING

Grout and cement mortar for setting railings, frames in walls and where otherwise required shall be done with mortar of 1 part cement to 1 part sand. Before placing grout, thoroughly clean all surfaces. Grout shall be tamped into place with a blunt tool to fill the entire void. In the event space does not permit tamping, the Contractor shall build the necessary forms and place the grout by pouring from one side only. When grout is placed by pouring, a head of grout shall be maintained in the form. Grout shall be kept wet for three days after the temporary supports or adjusting wedges are removed; the empty space shall be filled with grout and shall be pointed.

3.4 CLEANING

All exposed masonry work shall be thoroughly cleaned. Mortar smears and droppings on concrete block walls shall be dry before removal with a trowel. Masonry work may be cleaned using a mild muriatic acid solution.

**** END OF SECTION ****

SECTION 05100
STRUCTURAL STEEL

PART 1 – GENERAL

1.1 SCOPE OF WORK

The Work includes providing all labor, materials, equipment and incidentals necessary to furnish and install all structural steel items including bearing plates and miscellaneous shapes and plates required for proper erection of structural materials as shown on the Drawings.

1.2 RELATED SECTIONS

Other sections of the Specifications shall also apply to the extent required for proper performance of this Work.

Section 33014	Miscellaneous Metals

1.3 SPECIFICATIONS AND STANDARDS

Except as otherwise indicated, the current editions of the following Standards apply to the WORK of this Section:

ASTM A36	Carbon Structural Steel
ASTM A325	Structural Bolts, Steel, Heat Treated, 120/105 Ksi Minimum Tensile Strength
ISO 261	ISO General Purpose Metric Screw Threads - General Plan
AWS A5.1	Mild Steel Covered Arc-Welding Electrodes
AWS D1.4	Structural Welding Code – Reinforcing Steel
ACI 315	Details and Detailing of Concrete Reinforcement
ACI 318	Building Code Requirements for Reinforced Concrete

1.4 SUBMITTALS *(to be submitted during implementation stage)*

A. Detailed shop drawings of all structural steel items.
B. Samples as required by the applicable Reference Standards.

1.5 QUALITY ASSURANCE

The Contractor is responsible for the performance of all tests and inspection required by this Standard Specification. However, the owner reserves the right to perform any or all prescribed tests and inspection where such is deemed necessary to ensure that delivered materials conform to the specifications, and shall be paid for by the Contractor. The Contractor shall furnish the owner certified copies of records showing that each material has been pre-tested, and complied with all applicable requirements of this Standard. The Contractor shall, at his own expense, replace all rejected materials for failure to comply with this Specification.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Structural shapes, plates and bars unless otherwise noted shall conform to the requirements of ASTM A36.

B. Welding rods shall conform to AWS A5.1.

C. High strength steel bolts shall conform to ASTM A325.

PART 3 - EXECUTION

3.1 FABRICATION AND ERECTION

A. Details of concrete reinforcement steel for fabrication and erection shall conform to ACI 315, unless otherwise specified.

All members shall fit closely together and shall be straight and true; the finished work shall be free from burrs, bends, twists and open joints.

Materials for welding shall be the best available as recommended by the manufacturer of the materials to be welded, and in accordance with AWS Standards.

B. All holes, angles, supports, and braces shall be provided as required. Any unmatched holes in shop assembly of field connections shall be reamed and the pieces match marked before disassembly.

Drift pins shall be used only for bringing members into position and not to enlarge or distort holes.

Any piece weakened by reaming to compensate for eccentricity to a point where the strength of the joint is impaired will be rejected and a new and satisfactory piece shall be provided by the Contractor at his own expense.

Slotted holes and washers shall be provided for truing-up steel requiring accurate alignment.

C. Anchor bolts shall be accurately located on the base plates and welded in position.

3.2 FIELD CONNECTIONS

Base plates where required shall be accurately placed in position.

Field connections shall be made by welding or high strength bolting.

3.3 WELDING

Welding of parts shall be in accordance with the Structural Welding Code D1.1 of the AWS and shall only be done by welders certified as to their ability to perform welding in accordance with the locally accepted requirements.

The Contractor may substitute field bolting where field welding is shown, provided bolting details have been approved by the Engineer.

3.4 BOLTING

High-strength bolts shall conform to ASTM A325.

Anchor bolts shall be of mild steel with hexagonal nuts. Threads shall be clean cut and conform to ISO 261. Anchor bolts shall be hot-dip galvanized and shall be accurately set before the concrete is poured unless specifically permitted otherwise by the Engineer. To facilitate the setting of anchor bolts, the Contractor shall use screed plates, or may substitute wooden templates instead of screed plates upon written approval of the Engineer.

Anchor bolts with pipe sleeves shall be in accordance with the details shown on the Drawings.

3.5 PAINTING

A. Shop Painting

All structural steel shall be shop primed in accordance with Section 33035 after fabrication and cleaning.

All steelwork shall be thoroughly cleaned of all loose mill scale, rust, and foreign matter before shop painting.

Each individual piece shall be painted before assembly. Paint shall be applied only to dry surfaces.

Edges where field welding is required shall not be painted.

B. Field Painting

After erection, the Contractor shall thoroughly prepare and clean the structural steel surfaces of all dirt, grease, rust or other foreign matter.

**** END OF SECTION ****

SECTION 33015A
RETROFITTING (USING CARBON FIBER)

PART 1 – GENERAL

1.1 SCOPE OF WORK

The WORK includes furnishing all labor, materials, equipment and incidentals necessary for the completion of the steel piles corrosion protection system.

1.2 RELATED SECTIONS

Not Used

1.3 SUBMITTALS *(to be submitted during implementation stage)*

A. Samples / test reports / certificates as required.
B. Detailed working drawings.

1.4 QUALITY ASSURANCE

The Contractor is responsible for the performance of all tests and inspection required by this Standard Specification. However, the owner reserves the right to perform any or all prescribed tests and inspection where such is deemed necessary to ensure that delivered materials conform to the specifications, and shall be paid for by the Contractor. The Contractor shall furnish the owner certified copies of records showing that each material has been pre-tested, and complied with all applicable requirements of this Standard. The Contractor shall, at his own expense, replace all rejected materials for failure to comply with this Specification.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Composite Strengthening System

1. Carbon fabric or the approved equivalent.

   A material which is used where additional strength, modulus or environmental durability is required and is compatible with all commonly used epoxy resin systems.

Table 1 – Graphite Fiber Properties

Number of Filaments	12,000
Tensile strength (ksi)	550
Tensile modulus (msi)	34
Density (g/cc)	1.80
Elongation (%)	1.5

2. Epoxy Resin or the approved equivalent.

Clear Epoxy Resin Laminating Properties – Solvent Free Type

Component Properties		Resin	Hardener
Mix Ration (by weight)		100	33.3
Mix Ratio (by volume)		100	40
Viscosity @ 15 ◦C	mPAs	1869	231
Viscosity @ 20 ◦C	mPAs	1166	173
Viscosity @ 25 ◦C	mPAs	723	131
Viscosity @ 30 ◦C	mPAs	451	98
Shelf Life (month)		24	12
Color (Gadner)		Pale Violet	1
Mixed Color (Gadner)		1.163	0.969
Mixed Density	g/cm3		1.115
Hazard Definition		Xi, N	C

Cured System Properties		Cured 28 days @ 21 ◦C	Cured 24 hrs @ 21 ◦C + 16 hrs @ 50 ◦C
Tg DMTA (Peak Tan□δ)	◦C	64.4	84.2
Tg Ult – DMTA	◦C	97.5	97.5
□H – DSC	J/g	39	5
Tg1 – DMTA	◦C	54.4	74.2
Est. HDT	◦C	49	69
Moisture Absorption	%	1.37	1.20
Cured Density	g/cm3	1.161	1.16
Linear Shrinkage	%	1.6	1.6
Barcol Hardness		30	37
Cast Tensile Strength	Mpa	70.3	75.9
Cast Tensile Modulus	Gpa	3.67	3.70
Cast Strain to Failure	%	1.9	4.7
Laminates Comp. Strength	Mpa	398	444
Laminates T.V.M Strain	%	2.1	2.0
Laminates ILSS	Mpa	49.9	60.2
ILSS Wet Retention	%	76	77

	Resin/ Hardener			
Working Prop. Vs. Temp.	15 ◦C	20 ◦C	25 ◦C	30 ◦C
Initial Mixed Viscosity (cP)	1265	856	576	384
Gel Time – 150g Mix in water (hours : min)	-	0:58	0:35	0:21
Pot Life – 500g Mix in water (hours : min)	0:45	0:33	0:23	0:16
Latest Vacuum Flow Time (hours : min)	2:50	2:10	1:45	1:25
Earliest Vacuum Off Time (hours : min)	4:00	3:10	2:30	2:00
Demould Time (hours : min)	4:40	3:40	2:50	2:10

Resin Properties or the approved equivalent:

Table 2 - Mechanical properties – 1/8 inch castings with 72hr 140 ◦F cure

Test	Value	ASTM Test Method
Heat Deflection Temperature (HDT)	170□◦F	D648
Tensile Strength	10,500 psi	D638
Tensile Modulus	459,000 psi	D638
Elongation at Break	4.8%	D638
Flexural Strength	17,900 psi	D790
Flexural Modulus	452,000 psi	D790
Density	1.1567 g/cc	D792
Specific Gravity	1.1597	D792
Glass Transition Temperature (Tg) (ultimate 250□◦F cure)	188□◦F	D4065
Glass Transition Temperature (Tg) DMTA	174□◦F	D4065

PART 3 - EXECUTION

3.1 SAFETY

A. Safety policy issued shall be posted at a noticeable place in the site.

B. All personal protective equipment required for safe completion of the job shall be worn properly.

3.2 PRE – PROJECT PREPARATION

A. Obtain all equipment and materials as per checklist and any special project requirements.

3.3 SURFACE PREPARATION

A. Surfaces where the Composite Strengthening System is to be applied must be sound.

B. Rust scales, oil or grease, old paint coating, and other contaminants must be removed by any applicable method approved by the Engineer.

C. Inject cracks. Cracks greater than 0.25mm (0.010 in.) must be stabilized using epoxy injection methods.

D. Honeycombs and bug holes shall be filled up.

E. Remove form lines, sharp edges and protrusions by grinding or filling with putty. Ridges greater than 5mm may need to be ground down as per engineer's inspection.

F. Sharp edges, fins, and protrusions that can cause voids between the wrap and the steel girder surface or those that are injurious to the fibers shall be removed by grinding or any approved method approved by the Engineer. Ridges greater than 5mm may need to be ground down as per engineer's inspection.

G. Smoothen any surface undulations greater than 15mm over 1m as per the inspection of the engineer.

H. Radius corners perpendicular to the fiber orientation by grinding as per the project specifications.

I. Ensure and open pore structure of the substrate by either sandblasting, high-pressure water blasting or wire brushing.

J. Surfaces must be cleaned of dust and debris by blowing with air or broom cleaning.

K. The substrate should be dry before the application of the Composite Strengthening System.

L. All other method of surface preparation equal to the above standard maybe permitted subject for approval by the Engineer.

3.4 PREPARATION WORK FOR PROJECT

A. Review project specifications in detail.

B. Pre-cut fabric with off-site labor where possible.

C. Check surface-prep of substrate to make sure all patchwork is complete and cured.

3.5 SET – UP OF SATURATOR AND AUTOMATIC MIXING UNIT

A. When using automatic mixing unit, setting up shall be supervised and meticulously checked by the properly trained foreman or supervisor.

B. When using saturator, setting up shall be supervised and meticulously checked by the properly trained foreman or supervisor as per the manufacturer’s instructions. Gap to be measured and set for a ratio of 0.8:1.0 of epoxy to fabric by weight.

C. Equipment should be located in a well-ventilated and well lighted area.

3.6 EPOXY MIXING

A. Hand mix or use the automatic mixing unit to obtain proper mix ratio of 100 parts A to 40 parts B by volume OR 100 parts A to 33 parts B by weight from Epoxy Resin component container. The batch ratio tolerance is 5%.

   NOTE: Batching down from the pre-packaged units is not recommended.

B. Mix thoroughly as per instructions, for 5 minutes on low using a paddle-style mixer until uniformly blended.

3.7 SATURATION

A. Hand Saturation.

   1. Cover a smooth flat level surface with polyethylene sheeting, i.e., VISQUEEN™ or 0.5mm (20 mil) plastic film, approximately the length and width of the average size of the Carbon Fabric sheet to be applied.

   2. Prime the surface of the plastic sheeting by pouring a bead of the mixed Epoxy down the center, then spreading it out the epoxy with a spatula.

   3. Lay the pre-cut Carbon Fabric sheet down onto the epoxy covered plastic sheet and then pour another bead of Resin Epoxy directly on top.

   4. "Saturate" the Carbon Fabric sheet by applying smooth, even pressure with a spatula or roller to the fabric surface. The surface of the carbon fabric will have sheen to it and yet still appear to have some texture.

   5. A good way to check proper saturation is to periodically check the resin/fabric usage ratios. All of the epoxy that is recommended for a given square meters (footage) of fabric should be used up.

   6. Carefully roll-up the saturated Carbon Fabric onto a take-up roller (PVC tube) and use immediately.

3.8 APPLICATION

A. Beginning with a clean work area (free of dust and debris), place VISQUEEN™ or paper a minimum of four (4) feet around or under the element where the strengthening system is to be applied.

B. Using a roller, prime the area to be wrapped by applying Resin Epoxy. Wait approximately 1 hour to allow the epoxy to penetrate the substrate pores and to become "tacky".

C. Apply the saturated Carbon Fabric to the element to be strengthened as indicated on the drawings.

D. For maximum adhesion of vertical or overhead applications, apply the layers of Carbon Fabric individually, waiting approximately 1 hour in between layers. Columns may be continuously wrapped.

E. Apply Carbon Fabric with uniform and smooth pressure either with a stiff spatula or a surface roller removing and air bubbles caught beneath the fabric surface. More resin may be added to the applied Carbon Fabric with a wetted roller if necessary.

F. For Columns:

- Wrap the column with the specified number of wraps as calculated and indicated on the specification. Wrap TOP first; BOTTOM second or as per project specifications. Sequence to be advised on daily work sheet for each column. Follow the approved drawings.

- While continuously wrapping, apply Carbon Fabric with uniform and smooth pressure either with a stiff spatula or a surface roller, securing and smoothing each layer.

G. For Beams (including shear strengthening):

- Wrap the beam with the specified number of wraps as calculated and indicated on the specification. Sequence to be advised on daily work sheet for each beam. Follow the approved drawings.

- Apply shear strengthening layers on top of the flexural strengthening layers or as per engineering drawings. This method helps to secure the ends of the flexural strengthening.

- Install FibrAnchors as per specifications if required.

H. For Walls (including URM walls):

- Apply specified number of layers as calculated and indicated on the specification. Application sequence to be advised on daily work sheet. Follow the approved drawings.

- Install FibrAnchors as per specifications if required.

I. For Slabs

- Apply specified number of layers as calculated and indicated on the specification. Application sequence to be advised on daily work sheet. Follow the approved drawings.

- Additional set time may be necessary to properly adhere large sheets of Carbon Fabric in overhead applications.

- Install FibrAnchors as per specifications if required.

J. At Wall / Slab Connections:

- Install specified radius bedding of Epoxy Putty at joint of wall and slab, insuring that radius extends equally between the wall and slab as per drawings. Allow the Epoxy Putty to cure overnight to a tacky, firm state.

- Apply primer coat as per section "3.8."

- Apply Carbon Fabric with uniform and smooth pressure, either with a stiff spatula or a surface roller, onto the wall/slab and over the joint as per the drawings.

- Install FibrAnchors as per specifications if required.

3.9 FINISH

A. Cover the top and bottom of fiber or cut trim for aesthetics.

B. Paint as specified. Always wait until epoxy final coat is dry-tacky to touch. If over 72 hours, surface must be brush blasted.

3.10 CLEAN UP

A. Clean all equipment each day. Uncured epoxy should be wiped up with a rags wetted with MEK solvent or the equivalent.

B. If there is any uncured epoxy left at the end of the day, pour it out thinly on a flat polyethylene lined surface where it will cure safely overnight.

3.11 FIELD CONTROL

A. The Contractor shall assist, cooperate, and provide the necessary material samples and such auxiliary personnel and equipment needed to procure the test specimens.

B. The Contractor shall protect all retrofitting works against injury from the elements and defacements of any nature during construction operations.

3.12 INSPECTION

All finished works related to this section shall at all times be subject to the inspection and approval of the Engineer. Any defects found shall be repaired or restored by the contractor to the satisfaction of the Engineer.

3.13 FIELD TESTING

A. All samples selected shall undergo testing by an independent testing laboratory duly approved or recommended by the Engineer for verification.

B. Laboratory should precondition procured samples 48 hours at 60°C (140°F) before testing.

C. Laboratory must return results within ten days maximum.

**** END OF SECTION ****

Section VII. Drawings

SOCIAL SECURITY SYSTEM

EAST AVENUE, DILIMAN, QUEZON CITY

PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING

J.P. LAUREL AVE., BAJADA, DAVAO CITY

VICINITY MAP

PERSPECTIVE

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ALDEN C. ONG
ENGINEER

TABLE OF CONTENTS

GENERAL NOTES:

A. GENERAL

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SPECIFIED.
2. ALL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE SPECIFICATIONS.
3. ALL DIMENSIONS SHALL TAKE PRECEDENCE OVER THE SCALE SHOWN ON PLANS, SECTIONS, AND DETAILS.
4. THE CONTRACTOR SHALL VERIFY ALL ACTUAL DIMENSIONS AND CONDITIONS AT THE SITE PRIOR TO CONSTRUCTION.
5. THE CONTRACTOR SHALL SUBMIT WORKING / SHOP DRAWINGS FOR ANY PROPOSED CHANGES TO SUIT ACTUAL FIELD CONDITIONS WHICH ARE SUBJECT FOR THE APPROVAL OF THE CONSULTANT.
6. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SAFETY MEASURES AT THE SITE TO PROTECT LIVES, PROPERTIES, EXISTING STRUCTURES AND ENVIRONMENT.
7. NO STRUCTURE SHALL BE CONSTRUCTED UNTIL ALL PREPARATIONS HAS BEEN APPROVED BY THE CONSULTANT.

B. CONCRETE

1. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE AT 28 DAYS PERIOD: f'c = 28 MPa
2. CONCRETE COVER TO STIRRUPS & TIES = 40MM
3. ALL DEPOSITED CONCRETE SHALL BE COMPACTED USING VIBRATORS.
4. BEFORE CONCRETE IS POURED, CHECK WITH ALL TRADES TO ENSURE PROPER PLACEMENT OF ALL OPENINGS, SLEEVES, CURBS, CONDUITS, ETC. RELATIVE TO THE WORK.
5. WHEN CONCRETE WILL BE EXPOSED TO EXTERNAL SOURCES OF CHLORIDES IN SERVICES, SUCH AS DEICING SALTS, BRACKISH WATER, SEAWATER OR SPRAY FROM THESE SOURCES, CONCRETE MUST BE PROPORTIONED TO SATISFY THE SPECIAL EXPOSURE REQUIREMENTS OF ACI 318-14.
6. ALL CONCRETE SHALL BE KEPT MOIST FOR A MINIMUM OF 7 CONSECUTIVE DAYS IMMEDIATELY AFTER POURING BY THE USE OF WET BURLAP.

C. REINFORCING STEEL:

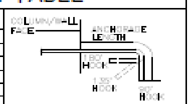
1. UNLESS OTHERWISE SPECIFIED ON PLANS, ALL REINFORCING BARS SHALL BE DEFORMED WITH A MINIMUM YIELD STRENGTH fy = 414 MPa (60000 PSI) FOR #12 AND ABOVE AND fy = 275 MPa (40000 PSI) FOR #10 AND BELOW.
2. ALL REINFORCING BARS SHALL BE CLEANED OF RUST, GREASE OR OTHER MATERIALS WHICH TEND TO IMPAIR BOND.
3. ALL REINFORCING BARS SHALL BE ACCURATELY AND SECURELY PLACED BEFORE POURING CONCRETE OR APPLYING MORTAR OR GROUT.
4. LAPPED SPLICES SHALL BE STAGGERED WHERE POSSIBLE.
5. UNLESS INDICATED OTHERWISE, SPLICING OF REINFORCEMENT SHALL BE IN ACCORDANCE WITH ACI- 318-95.

LAP SPLICES IN TENSION FOR BEAMS, COLUMNS AND WALLS (MM)

BAR DIA. (MM)	fy (Mpa)	fy (ksi)	f'c = 21 MPa (3000 psi)		f'c = 28-35 MPa (4000-5000 psi)	
			TOP	OTHERS	TOP	OTHERS
10	275	40	300	300	300	300
12	275	40	300	300	300	300
12	414	60	525	400	450	350
16	414	60	775	600	675	525
20	414	60	1075	825	925	725
25	414	60	1800	1375	1550	1200
28	414	60	2075	1600	1800	1400
32	414	60	2475	1900	2150	1650
36	414	60	2900	2225	2500	1925

ANCHORAGE LENGTH TABLE

BAR DIAMETER (mm)	ANCHORAGE LENGTH (m)	STANDARD HOOK (m)		
		90°	180°	135°
10	0.50	0.15	0.13	0.10
12	0.50	0.20	0.15	0.12
16	0.60	0.25	0.18	0.14
20	0.60	0.30	0.20	0.20
25	0.68	0.40	0.28	0.28
28	0.86	0.48	0.38	-
32	1.12	0.56	0.43	-
36	1.43	0.61	0.48	-



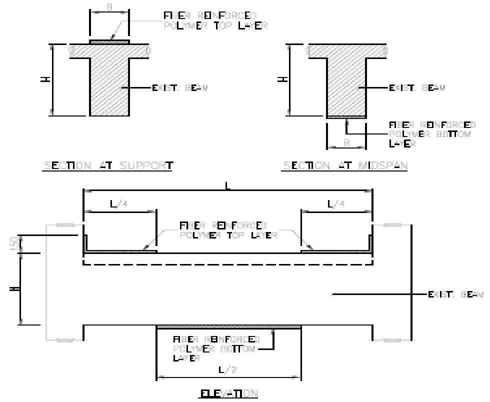
1 DETAIL
S-001 SCALE NTS

NOTES:

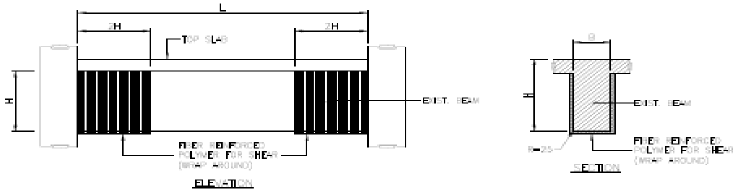
1. ACI SECTION 12.4 STATES THAT DEVELOPMENT LENGTH OF INDIVIDUAL BARS W/ IN A BUNDLE, IN TENSION OR COMPRESSION, SHALL BE THAT FOR THE INDIVIDUAL BAR, INCREASED 20% FOR THREE BAR BUNDLE, AND 33% FOR FOUR BAR BUNDLE.
2. FOR COLUMNS, AT ANY LEVEL NO MORE THAN ALTERNATE BARS SHOULD BE SPLICED. NOT MORE THAN 33% OF THE BARS SHALL BE SPLICED W/ IN THE REQUIRED LAP LENGTH. MIN. DISTANCE BETWEEN TWO ADJACENT BAR SPLICES SHALL BE 600MM. TOP BARS ARE HORIZONTAL BARS W/ MORE THAN 300MM DEPTH OF CONCRETE CAST BELOW THE REINFORCEMENT.
3. TOP BARS ARE HORIZONTAL BARS W/ MORE THAN 300MM DEPTH OF CONCRETE CAST BELOW THE REINFORCEMENT.
4. AS MUCH AS POSSIBLE, SPLICES SUBJECTED TO TENSILE STRESSES ARE DISCOURAGE. THESE SHOULD BE AVOIDED OR PROVIDED W/ STANDARD HOOKS.

D. FRP RETROFITTING

1. USE FIBER REINFORCED POLYMER (FRP) USING CARBON WITH A MINIMUM LAMINATE THICKNESS OF 1.0MM PER LAYER AND MINIMUM TENSILE STRENGTH IN PRIMARY FIBER DIRECTION OF 1000 MPa. CONCRETE REPAIR SHALL BE PERFORMED FOR ALL MEMBERS WITH DEFECTIVE CONCRETE PRIOR TO APPLICATION OF FRP.
2. CONTRACTOR TO SUBMIT CONSTRUCTION METHODOLOGY AND TECHNICAL SPECIFICATIONS FOR APPROVAL PRIOR TO IMPLEMENTATION.
3. CONTRACTOR TO PERFORM MATERIAL TESTING PRIOR TO FINAL ACCEPTANCE OF WORK.
4. THE CONTRACTOR SHALL CAREFULLY EXAMINE, COMPARE AND VERIFY THE DATA FURNISHED BY THE DRAWINGS AND SPECIFICATIONS. ANY QUERIES AS TO THE MEANING OF THE DRAWINGS OR OF THE SPECIFICATIONS OR OF ANY ERRORS/OMISSIONS AFTER ITS DISCOVERY, ANY WORK INVOLVING SUCH DISCREPANCIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
5. CONTRACTOR TO VERIFY ALL DIMENSIONS AND LENGTHS OF MEMBERS.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
7. THIS DRAWING IS TO BE READ SIMULTANEOUSLY WITH ALL RELEVANT ENGINEER'S AND ARCHITECT'S DRAWINGS AND WITH ALL RELEVANT SPECIFICATIONS.
8. FOR FRP RETROFITTING:
   A. CONCRETE SURFACE PREPARATION AND CLEANLINESS PRIOR TO APPLICATION OF FRP WRAP SHALL BE INACCORDANCE TO MANUFACTURER'S REQUIREMENTS.
   B. BEAMS SHALL BE RETROFITTED USING SIKAWRAP 600C FOR FLEXURE (TOP & BOTTOM) & SIKAWRAP 300C FOR SHEAR. SEE PLANS FOR THE NUMBER OF LAYERS.



2 TYP. BEAM RETROFITTING DETAIL FOR FLEXURE
S-001 SCALE NTS



3 TYP. BEAM RETROFITTING DETAIL FOR SHEAR
S-001 SCALE NTS

E. CONCRETE REPAIR

METHOD 1: CONCRETE REPAIR BY EPOXY PATCHING

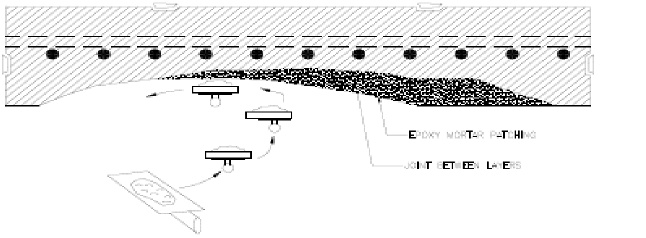
1. IDENTIFY SPALLED AREAS.
2. CHIPPING-REMOVE LOOSE CONCRETE AND CHIP TILL GOOD CONCRETE IS REACHED.
3. PREPARE STRUCTURAL EPOXY 316 PUTTY AND APPLY TO SPALLED AREA. LET EPOXY PUTTY CURE.
4. GRIND PROTRUDING EPOXY PUTTY FLUSH TO CONCRETE SURFACE.

METHOD 2: CONCRETE AND MASONRY REPAIR BY EPOXY INJECTION

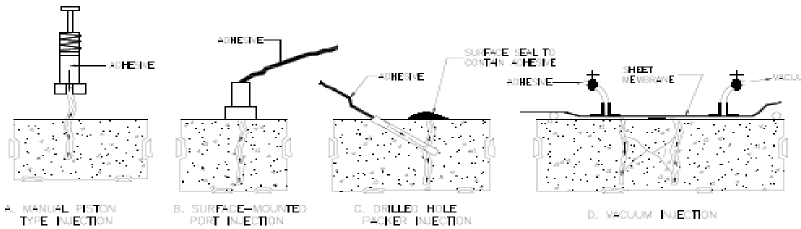
1. IDENTIFY CRACKS.
2. V-CUT ALONG CRACKS AND DRILL 1/2"ø HOLES TO A DEPTH OF APPROXIMATELY HALF THE STRUCTURES DIMENSION.
3. CLEANING - REMOVE LOOSE CONCRETE AND CONCRETE POWDERS.
4. INSTALL 1/4"ø COPPER TUBINGS INTO THE DRILLED HOLES.
5. APPLICATION OF STRUCTURAL EPOXY 316 PUTTY ON V-CUTS AND AROUND PERIPHERIES OF COPPER TUBINGS, AND ALLOW PUTTY TO CURE.
6. PRESSURE INJECT STRUCTURAL EPOXY 316 PUTTY THRU THE COPPER TUBES TO FILL CRACKS AND HONEYCOMBS (REPEAT #6 UNTIL ALL CRACKS AND HONEYCOMBS ARE FILLED WITH STRUCTURAL EPOXY 316 AND ALLOW EPOXY TO CURE).
7. GRIND PROTRUDING COPPER TUBES AND PUTTY FLUSH TO CONCRETE SURFACE.
8. APPLY REQUIRED FINISHES (IF NECESSARY).

NOTES:

1. UNLESS NOTED OTHERWISE, REPAIR METHOD(S) TO BE ADOPTED SHALL BE AS FOLLOWS:
   - SPALLING OF CONCRETE/POOR WORKMANSHIP/ HAIRLINE CRACKS - METHOD 1
   - CRACKING OF CONCRETE/ HONEYCOMB - METHOD 2
2. METHODS TO ADOPTED MAY VARY AS PER ENGINEER'S INSTRUCTION UPON CONFIRMATION OF ACTUAL CONDITION DURING REPAIR.
3. THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS SHOWING MAPPING PLAN FOR EACH METHOD USED IN THE REPAIR WORKS.



METHOD 1: CONCRETE REPAIR BY EPOXY PATCHING



METHOD 2: CONCRETE REPAIR BY EPOXY INJECTION

4 TYPICAL CONCRETE REPAIR DETAILS
S-001 SCALE NTS

RETROFITTING

a.c.ong CONSULTING INC. Engineering + Management ISO 9001:2015 Certified	DESIGNED BY: ALDEN C. ONG, M. Eng. ENGINEER	REG. NO.: 88251; TIN NO.: 158-850-786; PTR NO.: 8538852; DATE: JANUARY 08, 2021; PLACE: MAKATI CITY	OWNER: SOCIAL SECURITY SYSTEM (SSS) EAST AVENUE, DILIMAN, QUEZON CITY	CLIENT: APPROVED BY: EMMANUEL R. PALMA, SENIOR VICE PRESIDENT MINDANAO OPERATIONS GROUP	PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING, J.P. LAUREL AVE., BAJADA, DAVAO CITY	SHEET CONTENTS: GENERAL NOTES; TYP. BEAM RETROFITTING DETAIL FOR FLEXURE & SHEAR; TYPICAL CONCRETE REPAIR DETAILS

CADD	DATE	NO.	REVISIONS	CHK	DATE	PAPER SIZE	SHEET NO.
LMG	FEB 2021					20X30	S-001
DESIGNED	DATE					SCALE	PROJECT NO.
FAG	FEB 2021					AS SHOWN	SO-G-21-001
APPROVED	DATE						
ACO	FEB 2021	0					

SUMMARY OF BEAMS AND GIRDERS RETROFITTING

Floor Level	Retrofitting Method	Mark	Section		Flexure		Shear	GRID	Beam Enlargement Detail
			Width	Depth	ENDS	MIDSPAN			
Second Floor	FRP System	2B2	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top	1 Layer 450mm width SIKA Wrap 600C @ Bot	-	B/W B2-C2 & B1-C1	-
		2B2	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top	1 Layer 450mm width SIKA Wrap 600C @ Bot	-	B/W C2-D2 & C1-D1	-
		2B2	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top	1 Layer 450mm width SIKA Wrap 600C @ Bot	-	B/ WD4-E4 & D3-E3	-
		2CB3	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top	-	-	Left of Grid A & B/W Grid 4 and Grid 3	-
		2CB3	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top	-	-	Left of Grid A & B/W Grid 3 and Grid 2	-
		2CB3	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top	-	-	Left of Grid A & B/W Grid 2 and Grid 1	-
		2B5	200	400	1 Layer 200mm width SIKA Wrap 600C @ Top w/ 200mm lateral strip SIKA wrap	1 Layer 200mm width SIKA Wrap 600C @ Bottom w/ 200mm lateral strip SIKA wrap	1 Layer U-Wrap of SIKA 300C	Left of Grid A & B/W Grid 4 and Grid 3	-
		2B5	200	400	1 Layer 200mm width SIKA Wrap 600C @ Top w/ 200mm lateral strip SIKA wrap	1 Layer 200mm width SIKA Wrap 600C @ Bottom w/ 200mm lateral strip SIKA wrap	1 Layer U-Wrap of SIKA 300C	Left of Grid A & B/W Grid 3 and Grid 2	-
		2B3	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top	1 Layer 450mm width SIKA Wrap 600C @ Bot	-	Right of Grid E & Above Grid 4	-
		2B5	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Left of Grid A & B/W Grid 1-2, 2-3, and 3-4	-
		2B4	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & Part of Grid A-B and Grid D-E	-
		2B3	450	650	1 Layer 200mm width SIKA Wrap 600C @ Top w/ 200mm lateral strip SIKA wrap	1 Layer 200mm width SIKA Wrap 600C @ Bottom w/ 200mm lateral strip SIKA wrap	-	Left of Grid A & Below Grid 1	-
		2B4	200	400	1 Layer 200mm width SIKA Wrap 600C @ Top w/ 200mm lateral strip SIKA wrap	1 Layer 200mm width SIKA Wrap 600C @ Bottom w/ 200mm lateral strip SIKA wrap	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & Part of Grid D-E	-
		2B5	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & Part of Grid A-B	-
		2B5	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & Part of Grid B-C	-
		2B5	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & Part of Grid B-C	-
		2B5	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & Part of Grid C-D	-
		2B5	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & Part of Grid C-D	-
		2G9C	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top w/ 450mm lateral strip SIKA Wrap	1 Layer 450mm width SIKA Wrap 600C @ Bottom w/ 450mm lateral strip SIKA Wrap	-	Grid A4-B4	-
		2G8B	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top w/ 450mm lateral strip SIKA Wrap	1 Layer 450mm width SIKA Wrap 600C @ Bottom w/ 450mm lateral strip SIKA Wrap	-	Grid B3-C3	-
		2G4B	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top w/ 450mm lateral strip SIKA Wrap	1 Layer 450mm width SIKA Wrap 600C @ Bottom w/ 450mm lateral strip SIKA Wrap	-	Grid B3-B4	-
		2G2C	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top	1 Layer 450mm width SIKA Wrap 600C @ Bot	-	Grid D & Above Grid 4	-
		2CG4	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top	1 Layer 450mm width SIKA Wrap 600C @ Bot	-	Above Grid 4 & Part of Grid D-E	-
		2CG4	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top	1 Layer 450mm width SIKA Wrap 600C @ Bot	-	Above Grid 4 & Part of Grid D-E	-
		2CG2	450	650	1 Layer 450mm width SIKA Wrap 600C @ Top	1 Layer 450mm width SIKA Wrap 600C @ Bot	-	Above Grid 4 & Part of Grid D-E	-
Third Floor	FRP System	3G7C	450	650	1 Layer 250mm width SIKA Wrap 600C @ Top w/ 250mm lateral strip SIKA Wrap	2 Layers, 250 mm width SIKA Wrap 600c @ Top w/ 250mm lateral strip SIKA Wrap	1 Layer U-Wrap of SIKA 300C	Grid A2-B2	-
		3G7B	450	650	1 Layer 250mm width SIKA Wrap 600C @ Top w/ 250mm lateral strip SIKA Wrap	2 Layers, 250 mm width SIKA Wrap 600c @ Top w/ 250mm lateral strip SIKA Wrap	1 Layer U-Wrap of SIKA 300C	Grid B2-C2	-
		3G1B	450	650	1 Layers 250mm width SIKA Wrap 600C @ Top w/ 250mm lateral strip SIKA Wrap	-	1 Layer U-Wrap of SIKA 300C	Grid E3-E4	-
		3G2B	450	650	2 Layers 250mm width SIKA Wrap 600C @ Top w/ 250mm lateral strip SIKA Wrap	-	-	Grid D3-D4	-
Fourth Floor	FRP System	4CB1	200	400	1 Layers 250mm width SIKA Wrap 600C @ Top w/ 250mm lateral strip SIKA Wrap	-	1 Layer U-Wrap of SIKA 300C	Above Grid 4 & B/W Grid A-B	-
		4B3	250	500	1 Layer 200 mm width SIKA Wrap 600C @ Top w/ 200mm lateral strip SIKA Wrap	-	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & Left of Grid A	-
		4B5	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Left of Grid A & B/W Grid 1-2	-
		4B5	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Left of Grid A & B/W Grid 1-2	-
		4B5	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Left of Grid A & B/W Grid 2-3	-
		4B5	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Left of Grid A & B/W Grid 2-3	-
		4B5	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Left of Grid A & B/W Grid 3-4	-
		4B5	450	650	1 Layer 200mm width SIKA Wrap 600C @ Top w/ 200mm lateral strip SIKA wrap	-	-	Left of Grid A & B/W Grid 3-4	-
		4G9C	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Grid A4-B4	-
		4G9B	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid B4-C4	-
		4G9A	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid C4-D4	-
		4G9	450	650			1 Layer U-Wrap of SIKA 300C	Grid D4-E4	-
		4G8C	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid A3-B3	-
		4G8B	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid B3-C3	-
		4G8A	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid C3-D3	-
		4G8	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid D3-E3	-
		4G7C	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid A2-B2	-
		4G7B	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid B2-C2	-
		4G7A	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid C2-D2	-
		4G7	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid D2-E2	-
		4G6C	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid A1-B1	-
		4G6B	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid B1-B2	-
		4G6A	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid B2-B3	-
		4G6	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid B3-B4	-
		4CB1	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Above Grid 4 & B/W Grid A-B	-
		FSB1	250	500	-	-	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & B/W Grid A-B	-
		4B3	200	400	-	-	1 Layer U-Wrap of SIKA 300C	Left of Grid D & Below Grid 1	-
		4CG10	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid D4-E4	-
		4CG10A	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid D4-E4	-
		4CG10	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid D4-E4	-
Roof Deck	Enlargement	RG2B	450	650	-	-	-	Grid D3-D4	EB1
	FRP System	RB5	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & Right of Grid A	-
		RB5	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & Right of Grid A	-
		RB10	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Above Grid 4 & B/W Grid D-E	-
		RG5	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Below Grid 1 & B/W Grid A-B and Grid A1-A2	-
		RG5A	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid A2-A3	-
		RG5B	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid A3-A4	-
		RG3	450	650	-	-	1 Layer U-Wrap of SIKA 300C	Grid C1-C2	-

RETROFITTING

a.c.ong CONSULTING INC.
Engineering + Management
ISO 9001:2015 Certified

ALDEN C. ONG, M.Eng.

OWNER: SOCIAL SECURITY SYSTEM (SSS)
EAST AVENUE, DILIMAN, QUEZON CITY

CLIENT / APPROVED BY: EMMANUEL R. PALMA

PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING
J.P. LAUREL AVE., BAJADA, DAVAO CITY

SHEET CONTENTS: SUMMARY OF BEAMS AND GIRDER RETROFITTING

PAPER SIZE: 20X30
SHEET NO.: S-002
SCALE: AS SHOWN
PROJECT NO.: SO-G-21-001

SCHEDULE OF COLUMN RETROFITTING

MARK	LOCATION	GRID	COLUMN ENLARGEMENT			FRP SYSTEM
			DETAIL	EXISTING DIMENSION(MM)	PROPOSED NEW DIMENSION(MM)	
C1	Foundation to Ground	Grid A-4	EC1	600X600	800X800	-
		Grid E-1		600X600	800X800	
	Ground to Second	Grid A-4		600X600	800X800	
		Grid E-1		600X600	800X800	
	Second to Third	Grid A-4		600X600	800X800	
		Grid E-1		600X600	800X800	
	Third to Fourth	Grid A-4	-			1 Layer SIKA Wrap 600C @ H/4, Top and Bottom
		Grid E-1				
	Fourth to Roofdeck	Grid A-4				
		Grid E-1				
C2	Foundation to Ground	Grid A-2	EC2	600X600	800X700	-
		Grid A-3		600X600	800X700	
		Grid E-2		600X600	800X700	
		Grid E-3		600X600	800X700	
	Ground to Second	Grid A-3		600X600	800X700	
		Grid A-2		600X600	800X700	
		Grid E-2		600X600	800X700	
		Grid E-3		600X600	800X700	
	Second to Third	Grid A-3		600X600	800X700	
		Grid A-2		600X600	800X700	
		Grid E-2		600X600	800X700	
		Grid E-3		600X600	800X700	
	Third to Fourth	Grid A-3	-			1 Layer SIKA Wrap 600C @ H/4, Top and Bottom
		Grid A-2	EC2	600X600	800X700	-
		Grid E-2		600X600	800X700	
		Grid E-3		600X600	800X700	
	Fourth to Roofdeck	Grid A-3	-			1 Layer SIKA Wrap 600C @ H/4, Top and Bottom
		Grid A-2	EC2	600X600	800X700	-
		Grid E-2		600X600	800X700	
		Grid E-3		600X600	800X700	
C3	Foundation to Ground	Grid E-4	EC4	400X800	600X1000	-
	Ground to Second	Grid E-4		400X800	600X1000	
	Second to Third	Grid E-4		400X800	600X1000	
	Third to Fourth	Grid E-4		400X800	600X1000	
	Fourth to Roofdeck	Grid E-4		400X800	600X1000	
C4	Foundation to Ground	Grid D-4'	-			1 Layer SIKA Wrap 600C @ H/4, Top and Bottom
		Grid E-4'				
	Ground to Second	Grid D-4'				
		Grid E-4'				
	Second to Third	Grid D-4'				
		Grid E-4'				
	Third to Fourth	Grid D-4'				
		Grid E-4'				
	Fourth to Roofdeck	Grid D-4'				
		Grid E-4'				
C5	Foundation to Ground	Grid B-4	EC2	600X600	800X700	-
		Grid C-4		600X600	800X700	
		Grid B-2		600X600	800X700	
		Grid C-2		600X600	800X700	
		Grid D-2		600X600	800X700	
	Ground to Second	Grid B-4		600X600	800X700	
		Grid C-4		600X600	800X700	
		Grid B-2		600X600	800X700	
		Grid C-2		600X600	800X700	
		Grid D-2		600X600	800X700	
	Second to Third	Grid B-4		600X600	800X700	
		Grid C-4		600X600	800X700	
		Grid B-2		600X600	800X700	
		Grid C-2		600X600	800X700	
		Grid D-2		600X600	800X700	
	Third to Fourth	Grid B-4		600X600	800X700	
		Grid C-4		600X600	800X700	
		Grid B-2		600X600	800X700	
		Grid C-2		600X600	800X700	
		Grid D-2		600X600	800X700	
	Fourth to Roofdeck	Grid B-4	-			1 Layer SIKA Wrap 600C @ H/4, Top and Bottom
		Grid C-4				
		Grid B-2				
		Grid C-2				
		Grid D-2				

SCHEDULE OF COLUMN RETROFITTING

MARK	LOCATION	GRID	COLUMN ENLARGEMENT			FRP SYSTEM
			DETAIL	EXISTING DIMENSION(MM)	PROPOSED NEW DIMENSION(MM)	
C6	Foundation to Ground	Grid B-3	EC3	650X650	850X850	-
		Grid B-2		650X650	850X850	
		Grid C-2		650X650	850X850	
		Grid D-2		650X650	850X850	
	Ground to Second	Grid B-3		600X600	850X850	
		Grid B-2		600X600	850X850	
		Grid C-2		600X600	850X850	
		Grid D-2		600X600	850X850	
	Second to Third	Grid B-3		600X600	850X850	
		Grid B-2		600X600	850X850	
		Grid C-2		600X600	850X850	
		Grid D-2		600X600	850X850	
	Third to Fourth	Grid B-3	-			1 Layer SIKA Wrap 600C @ H/4, Top and Bottom
		Grid B-2				
		Grid C-2				
		Grid D-2	EC3	600X600	800X800	-
	Fourth to Roofdeck	Grid B-3	-			1 Layer SIKA Wrap 600C @ H/4, Top and Bottom
		Grid B-2				
		Grid C-2				
		Grid D-2				
C7	Foundation to Ground	Grid C-3	EC3	650X650	850X850	-
		Grid D-3		650X650	850X850	
	Ground to Second	Grid C-3		600X600	850X850	
		Grid D-3		600X600	850X850	
	Second to Third	Grid C-3		600X600	850X850	
		Grid D-3		600X600	850X850	
	Third to Fourth	Grid C-3		600X600	800X800	
		Grid D-3		600X600	800X800	
	Fourth to Roofdeck	Grid C-3	-			1 Layer SIKA Wrap 600C @ H/4, Top and Bottom
		Grid D-3	EC3	600X600	800X800	-
C8	Foundation to Ground	Grid D-4	-			1 Layer SIKA Wrap 600C @ H/4, Top and Bottom
	Ground to Second	Grid D-4				
	Second to Third	Grid D-4				
	Third to Fourth	Grid D-4				
	Fourth to Roofdeck	Grid D-4				
C9	Foundation to Ground	Grid A-1	EC1	600X600	800X800	-
	Ground to Second	Grid A-1		600X600	800X800	
	Second to Third	Grid A-1		600X600	800X800	
	Third to Fourth	Grid A-1	-			1 Layer SIKA Wrap 600C @ H/4, Top and Bottom
	Fourth to Roofdeck	Grid A-1				

RETROFITTING

a.C.ONG CONSULTING INC.
Engineering + Management
ISO 9001:2015 Certified

DESIGNED BY: ALDEN C. ONG, M. Eng.
DRAWN BY:
CHECKED BY:

OWNER: SOCIAL SECURITY SYSTEM (SSS)

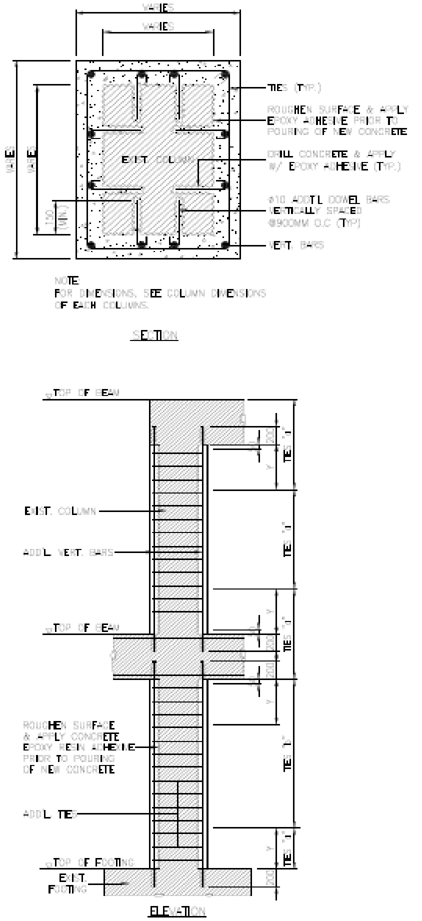
CLIENT
APPROVED BY: EMMANUEL R. DELA PEÑA

PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING

SHEET CONTENTS: SCHEDULE OF COLUMN RETROFITTING

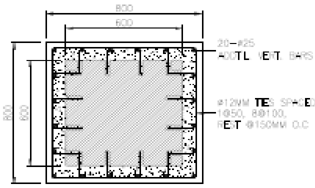
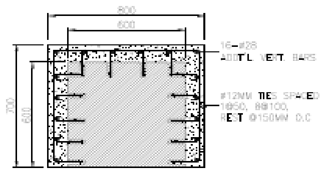
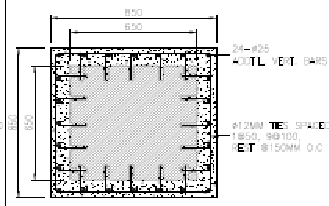
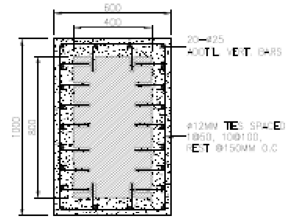
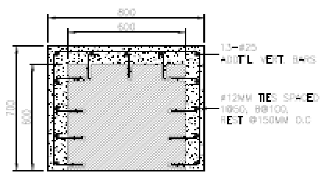
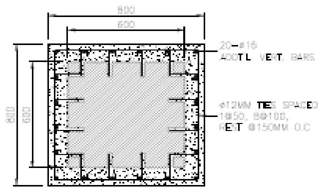
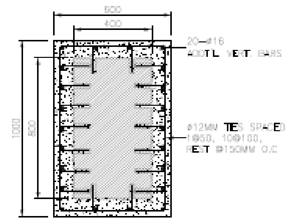
NO.	REVISIONS	BY	DATE

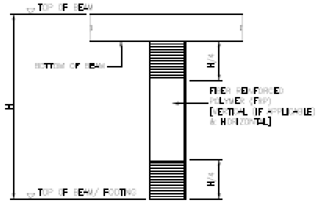
DATE: REV. 2021
SCALE: AS SHOWN
PROJECT NO.: SO-G-21-001
SHEET NO.: S-003



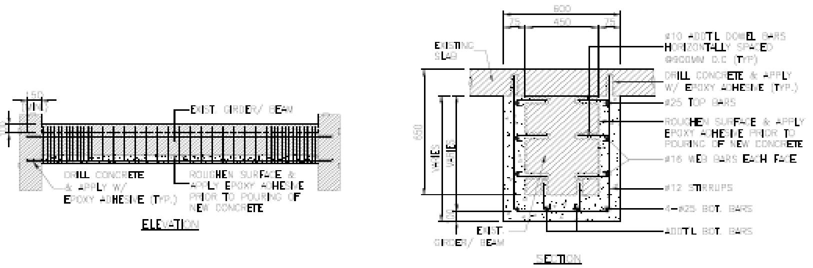
1 S-004 TYPICAL COLUMN ENLARGEMENT DETAIL
SCALE NTS

COLUMN ENLARGEMENT SCHEDULE

COL. MARK / FLOOR LEVEL	EC1	EC2	EC3	EC4
FOUNDATION TO 3RD FLOOR				
3RD FLOOR TO ROOF DECK				



2 S-004 TYPICAL COLUMN FRP RETROFITTING DETAIL
SCALE NTS

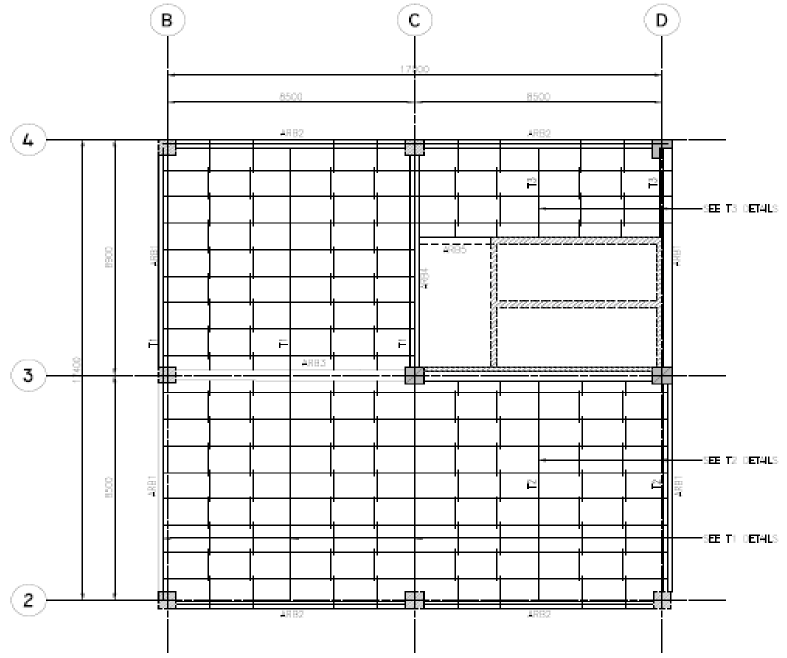


3 S-004 EB1 DETAIL
SCALE NTS

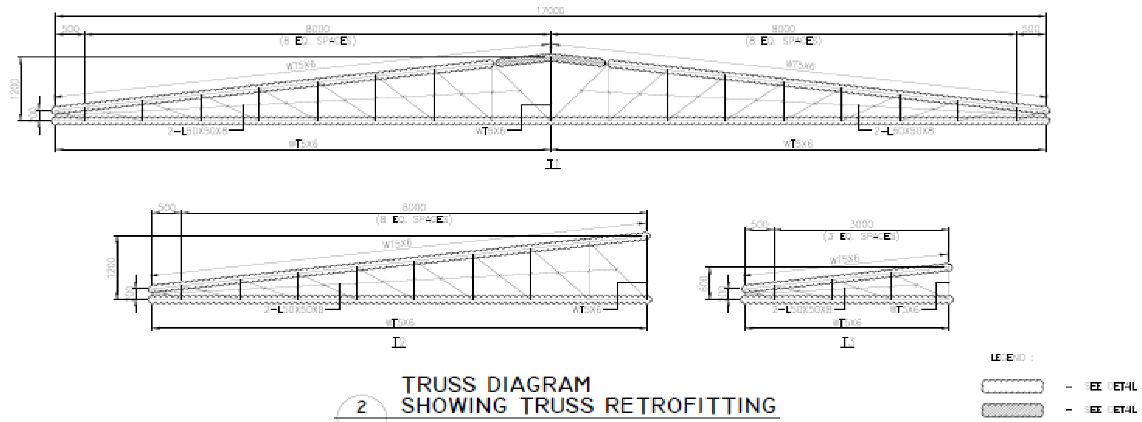
RETROFITTING

a.c.ONG CONSULTING INC. Engineering + Management ISO 9001:2015 Certified	DESIGNED BY: ALDEN C. ONG, M.Eng. ASEP ENGINEER	REG. NO.: 68251 TIN NO.: 168-050-786 PTR NO.: 8538952 DATE: JANUARY 08, 2021 PLACE: MAKATI CITY	OWNER: SOCIAL SECURITY SYSTEM (SSS) EAST AVENUE, DILIMAN, QUEZON CITY	CLIENT: APPROVED BY: EMMANUEL R. PALMA SENIOR VICE PRESIDENT MINDANAO OPERATIONS GROUP	PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING J.P. LAUREL AVE., BAJADA, DAVAO CITY	SHEET CONTENTS: TYPICAL COLUMN ENLARGEMENT DETAIL EB1 DETAIL

PAPER SIZE	SHEET NO.
20X30	S-004
SCALE	PROJECT NO.
AS SHOWN	SO-G-21-001



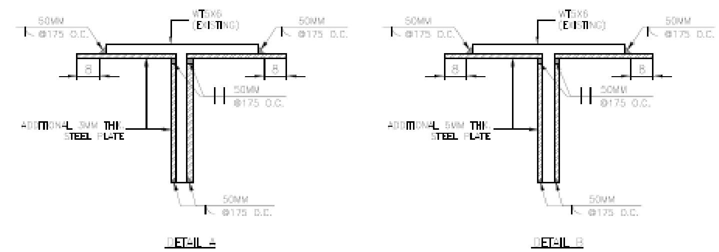
ROOF FRAMING PLAN
SHOWING TRUSS RETROFITTING
1 S-005 SCALE 1:100M



TRUSS DIAGRAM
SHOWING TRUSS RETROFITTING
2 S-005 SCALE 1:50M

NOTE :

1. THE CONTRACTOR SHALL BE RESPONSIBLE IN MAINTAINING THE GEOMETRY OF THE TRUSS AND ITS MEMBERS DURING STRENGTHENING AND INSTALLATION.
2. DURING THE WELDING PROCEDURE, THE CONTRACTOR SHALL PROVIDE SUPPORTS FOR THE TOP AND BOTTOM CHORD, OR OTHER MEANS NECESSARY TO ENSURE THAT THE MEMBERS WILL NOT UNDERGO DEFORMATION.
3. WHERE THE EXISTING TRUSS (ES) DIFFER SIGNIFICANTLY FROM AS-BUILT DRAWINGS, THE CONTRACTOR SHALL INFORM AND SUBMIT DRAWINGS OF THE ACTUAL TRUSS (ES) GEOMETRY AND MEMBER SIZES FOR ADJUSTMENT.



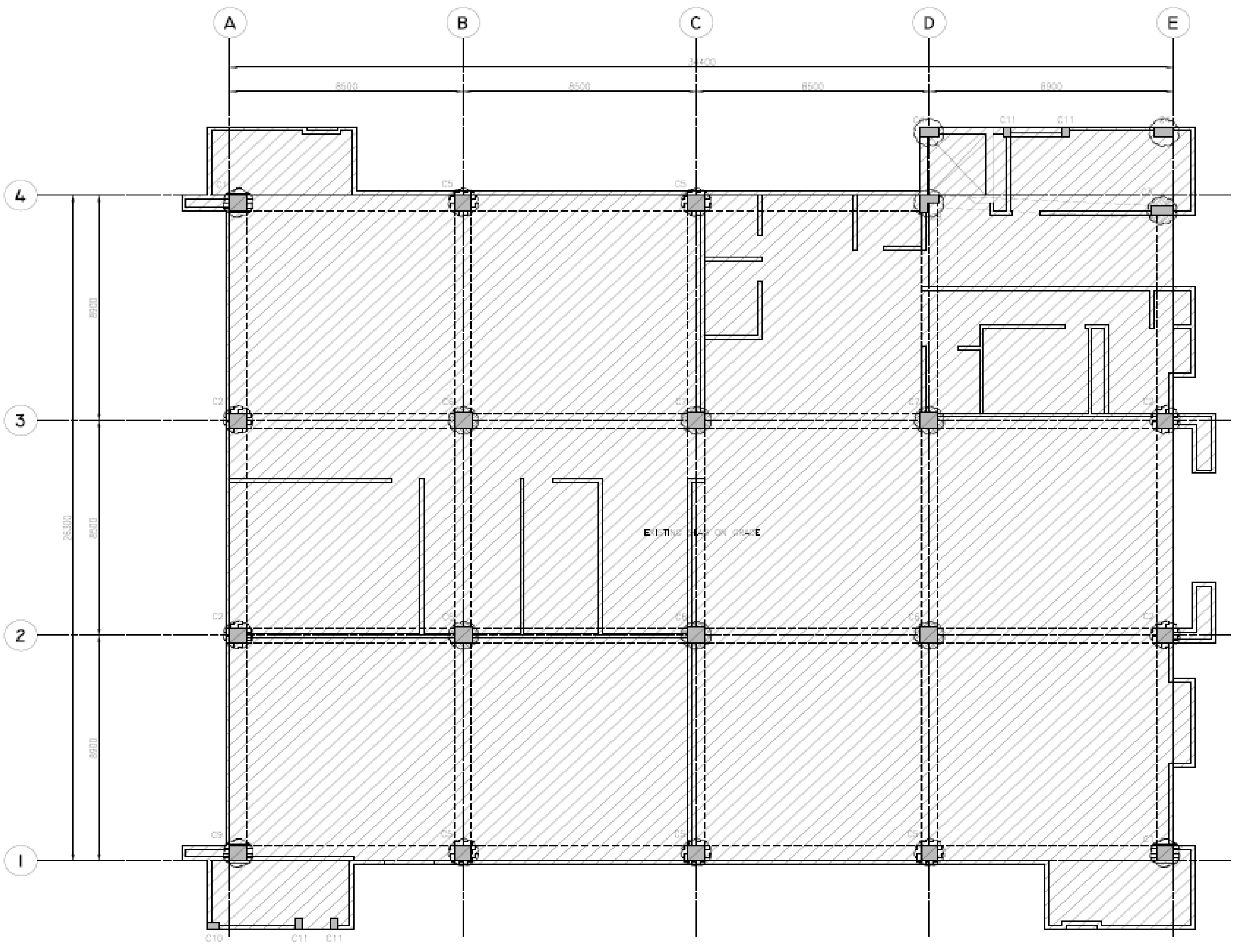
3 TRUSS MEMBERS RETROFITTING DETAILS
S-005 SCALE 1:40M

RETROFITTING

A.C.ONG CONSULTING INC. Engineering + Management ISO 9001:2015 Certified	DESIGNED BY: ALDEN C. ONG, M. Eng. ASEP ENGINEER	REG. NO.: 88251; TIN NO.: 188-050-788; PTR NO.: 8536852; DATE: JANUARY 08, 2021; PLACE: MAKATI CITY	OWNER: SOCIAL SECURITY SYSTEM (SSS) EAST AVENUE, DILIMAN, QUEZON CITY	CLIENT: APPROVED BY: EMMANUEL R. PALMA SENIOR VICE PRESIDENT MINDANAO OPERATIONS GROUP	PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING J.P. LAUREL AVE., BAJADA, DAVAO CITY	SHEET CONTENTS: ROOF FRAMING PLAN SHOWING TRUSS RETROFITTING TRUSS MEMBERS RETROFITTING DETAILS

CADD	DATE	NO.	REVISIONS	CHK	DATE
DWG	FEB 2021				
DESIGNED	DATE				
PMG	FEB 2021				
APPROVED	DATE				
ACO	FEB 2021	0			

PAPER SIZE	SHEET NO.
20X30	S-005
SCALE	PROJECT NO.
AS SHOWN	SO-G-21-001



GROUND FLOOR PLAN
SHOWING COLUMNS FOR RETROFITTING
1 / S-006 SCALE 1:100M

LEGEND :

- EC1
- EC2
- EC3
- EC4
- 1 LAYER SIKA WRAP 600C

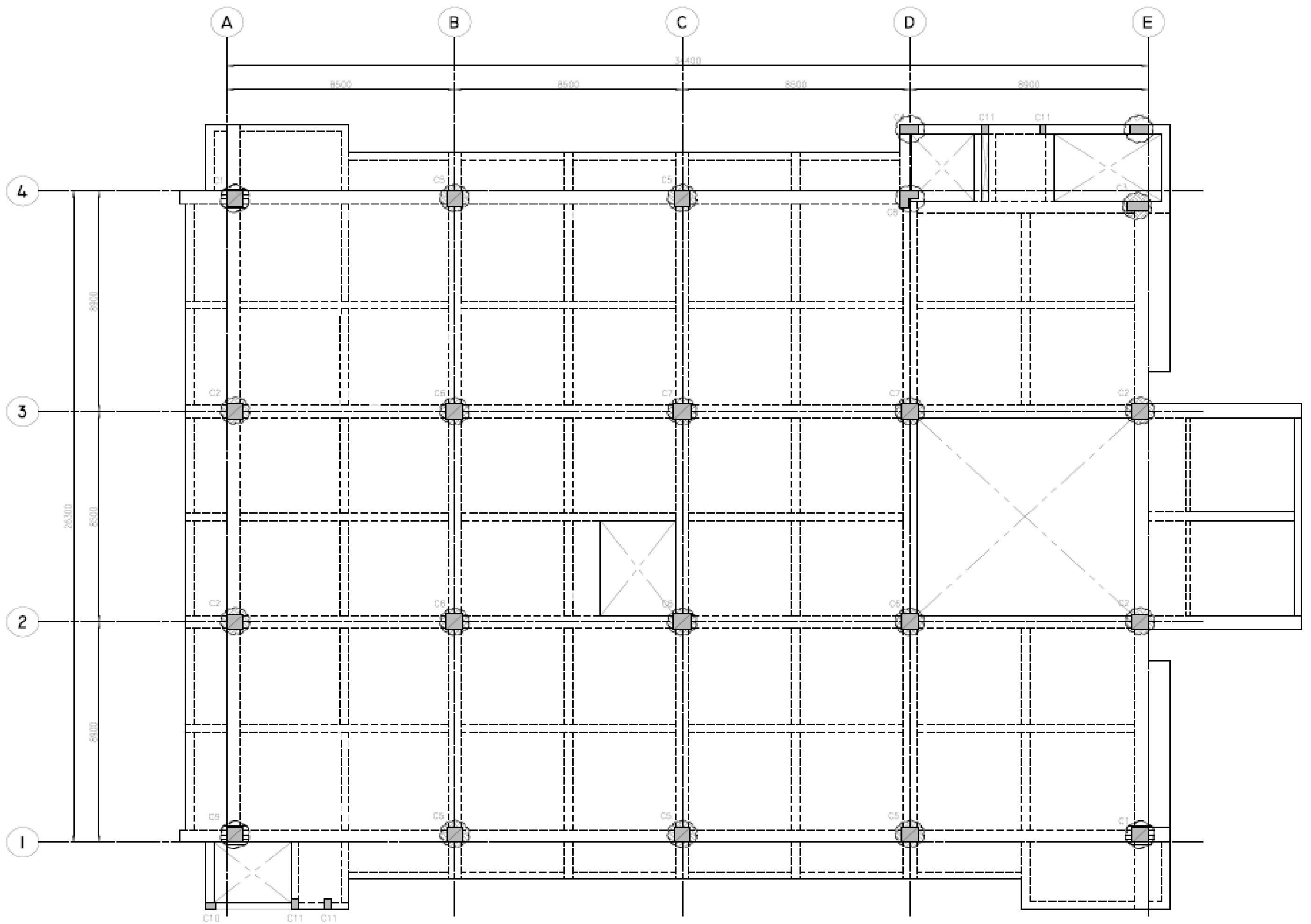
RETROFITTING

a.c.ong CONSULTING INC. Engineering + Management ISO 9001:2015 Certified	DESIGNED BY: ALDEN C. ONG, M.Eng. ASEP ENGINEER	REG. NO.: 88251 TIN NO.: 158-950-788 PTR NO.: 8538852 DATE: JANUARY 08, 2021 PLACE: MAKATI CITY	OWNER: SOCIAL SECURITY SYSTEM (SSS) EAST AVENUE, DILIMAN, QUEZON CITY	CLIENT: APPROVED BY: EMMANUEL R. PALMA SENIOR VICE PRESIDENT MINDANAO OPERATIONS GROUP	PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING J.P. LAUREL AVE., BAJADA, DAVAO CITY	SHEET CONTENTS: GROUND FLOOR PLAN SHOWING ENLARGEMENT COLUMN

R.A. 9266 SEC. 33 DRAWINGS AND SPECIFICATIONS AND CONTRACT DOCUMENTS DULY SIGNED, STAMPED OR SEALED AS INSTRUMENTS FOR SERVICE ARE THE INTELLECTUAL PROPERTY AND DOCUMENTS OF ARCHITECT WHETHER THE OBJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. IT SHALL BE UNLAWFUL FOR ANY PERSON TO DUPLICATE OR TO MAKE COPIES OF SAID DOCUMENTS FOR USE IN THE REPETITION OF AND FOR OTHER PROJECTS OR BUILDINGS, WHETHER EXECUTED PARTLY OR IN WHOLE WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT OR AUTHOR OF SAID DOCUMENTS.

CADD	DATE	NO.	REVISIONS	CHK	DATE
LMG	FEB 2021				
DESIGNED	DATE				
PAG	FEB 2021				
APPROVED	DATE				
ACO	FEB 2021	0			

PAPER SIZE	SHEET NO.
20X30	S-006
SCALE	PROJECT NO.
AS SHOWN	SO-G-21-001



SECOND FLOOR FRAMING PLAN SHOWING COLUMNS FOR RETROFITTING

1 / S-007

SCALE 1:100M

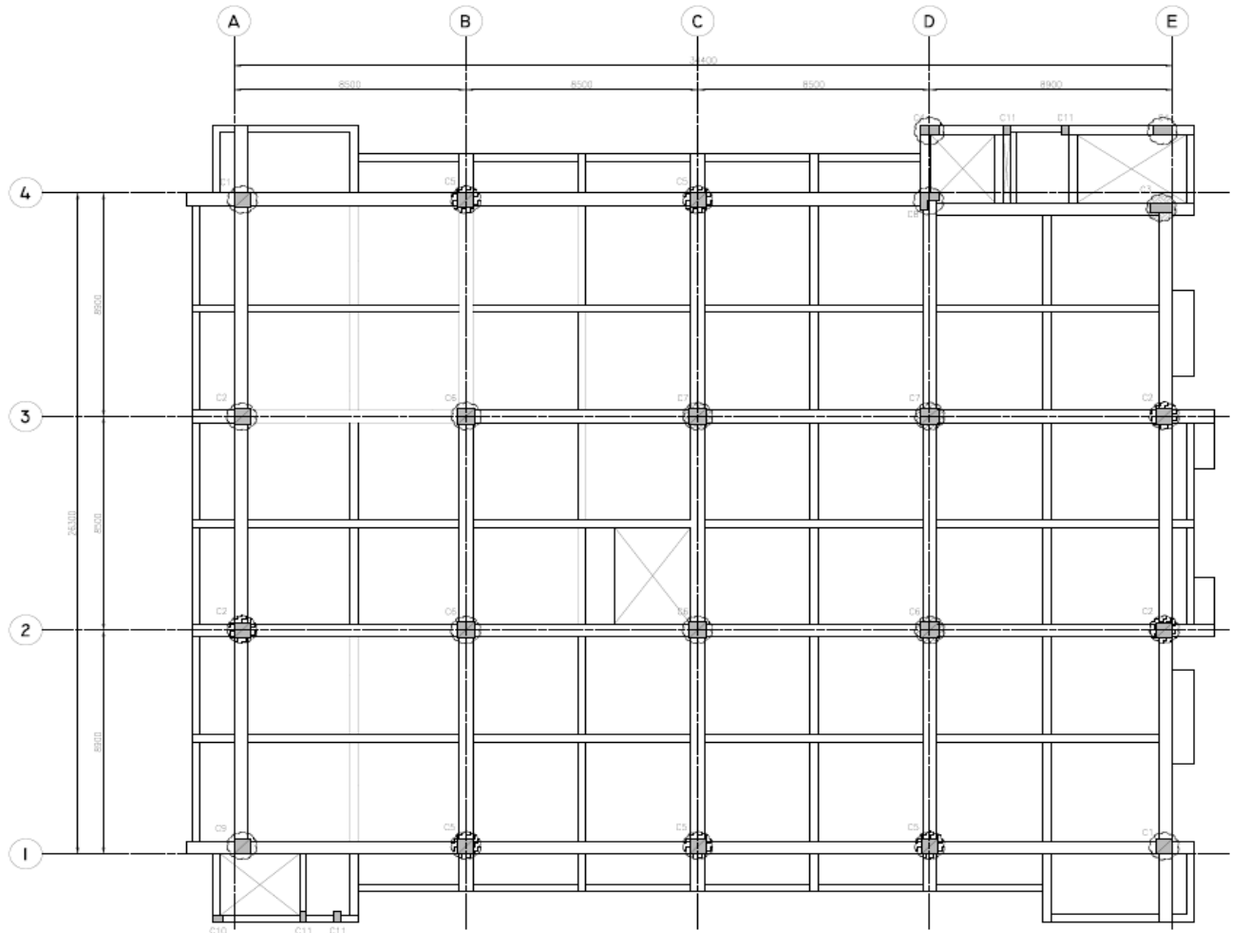
LEGEND :

- EC1
- EC2
- EC3
- EC4
- 1 LAYER SIKA WRAP 600C

RETROFITTING

a.c.ong CONSULTING INC. Engineering + Management ISO 9001:2015 Certified	DESIGNED BY: ALDEN C. ONG, M.Eng. ASEP, ENGINEER	REG. NO.: 58251; TIN NO.: 188-950-786; PTR NO.: 8538852; DATE: JANUARY 08, 2021; PLACE: MAKATI CITY	OWNER: SOCIAL SECURITY SYSTEM (SSS), EAST AVENUE, DILIMAN, QUEZON CITY	CLIENT: APPROVED BY: EMMANUEL R. PALMA, SENIOR VICE PRESIDENT, MINDANAO OPERATIONS GROUP	PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING, J.P. LAUREL AVE., BAJADA, DAVAO CITY	SHEET CONTENTS: SECOND FLOOR FRAMING PLAN SHOWING COLUMNS FOR RETROFITTING

CADD	DATE	NO.	REVISIONS	CHK	DATE	PAPER SIZE	SHEET NO.
LMC	FEB 2021					20X30	S-007
DESIGNED	DATE					SCALE	PROJECT NO.
RAG	FEB 2021					AS SHOWN	SO-G-21-001
APPROVED	DATE						
ACO	FEB 2021	0					



THIRD FLOOR FRAMING PLAN
SHOWING COLUMNS FOR RETROFITTING

I
S-008

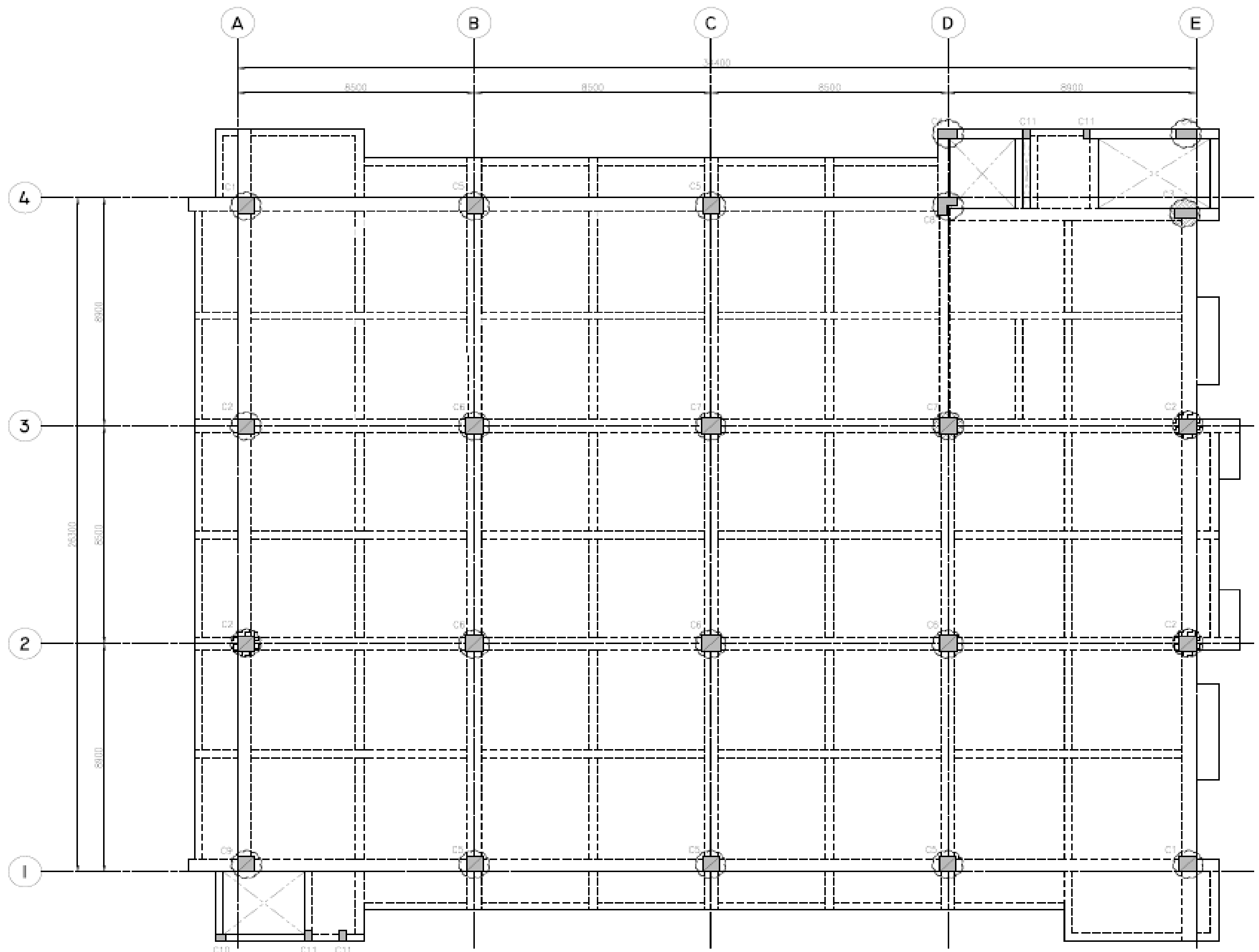
SCALE 1: 100M

LEGEND :

- E01
- E02
- E03
- E04
- 1 LAYER SIKA WRAP 600C

RETROFITTING

a.C.ONG CONSULTING INC. Engineering + Management ISO 9001:2015 Certified	DESIGNED BY: ALDEN C. ONG, M. Eng. CIVIL ENGINEER	OWNER: SOCIAL SECURITY SYSTEM (SSS)	CLIENT: APPROVED BY:	PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING	SHEET CONTENTS: THIRD FLOOR FRAMING PLAN SHOWING COLUMNS FOR RETROFITTING	RA 9266 SEC. 33	CADD	DATE	NO.	REVISIONS	NO.	DATE	FACILITY SIZE: 20X30	SHEET NO.: S-008
							DRG	REV 2021					SCALE: AS SHOWN	PROJECT NO.: SO-G-21-001
							DESIGNED	DATE						
							CHK	REV 2021						
							APPROVED	DATE						
							ACD	REV 2021	0					



FOURTH FLOOR FRAMING PLAN
SHOWING COLUMNS FOR RETROFITTING

1
S-009

SCALE 1:100M

LEGEND :

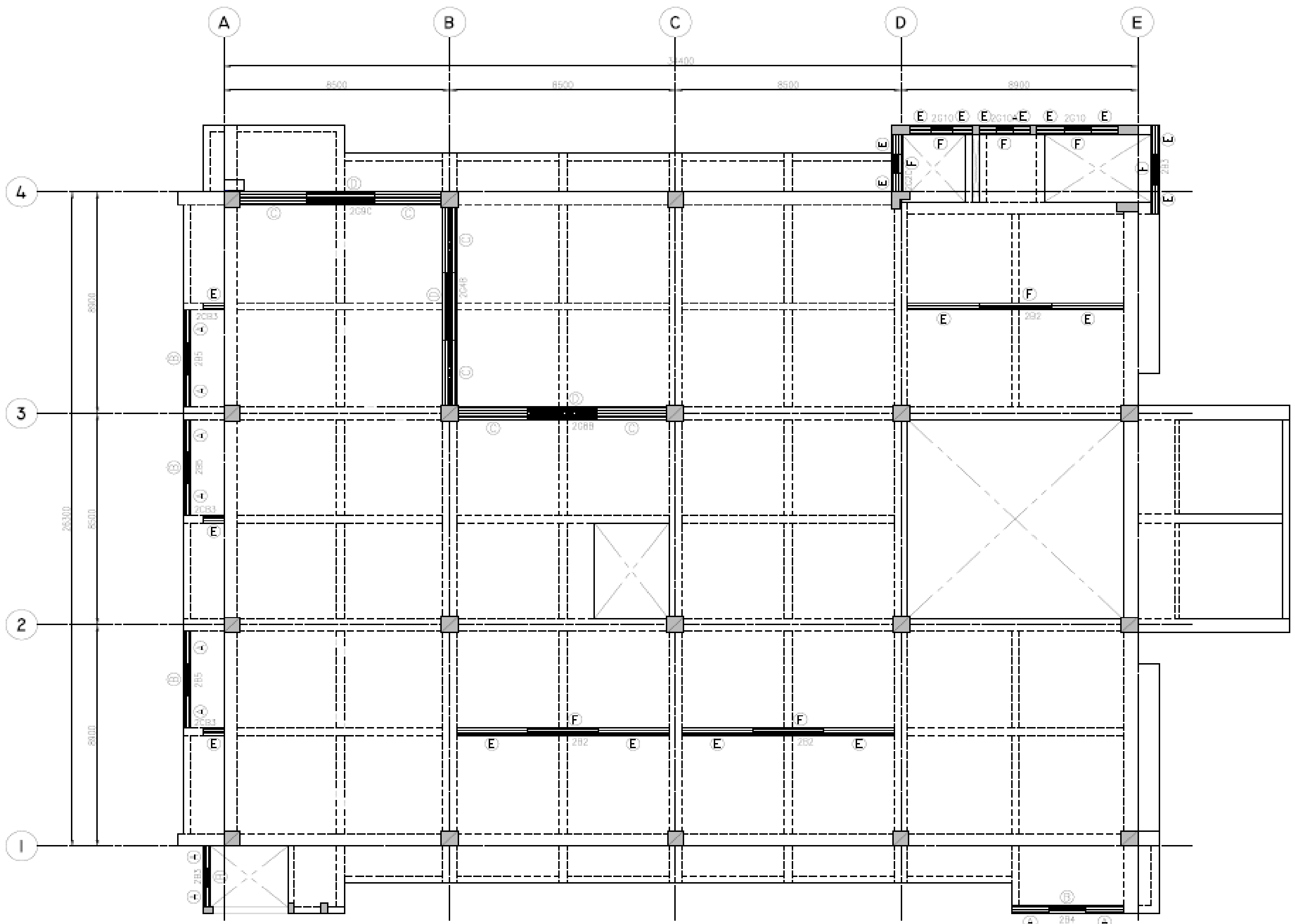
- EC1
- EC2
- EC3
- EC4
- 1 LAYER SIKA WRAP 600C

RETROFITTING

a.c.ong CONSULTING INC. Engineering + Management ISO 9001:2015 Certified	DESIGNED BY: ALDEN C. ONG, M. Eng. ASEP, ENGINEER	REG. NO.: 88251; TIN NO.: 168-950-788; PTR NO.: 8536952; DATE: JANUARY 08, 2021; PLACE: MAKATI CITY	OWNER: SOCIAL SECURITY SYSTEM (SSS), EAST AVENUE, DILIMAN, QUEZON CITY	CLIENT: APPROVED BY: EMMANUEL R. PALMA, SENIOR VICE PRESIDENT, MINDANAO OPERATIONS GROUP	PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING, J.P. LAUREL AVE., BAJADA, DAVAO CITY	SHEET CONTENTS: FOURTH FLOOR FRAMING PLAN SHOWING COLUMNS FOR RETROFITTING	R.A. 9266 SEC. 33

CADD	DATE	NO.	REVISIONS	CHK	DATE
LMG	FEB 2021				
DESIGNED	DATE				
RAG	FEB 2021				
APPROVED	DATE				
ACO	FEB 2021	0			

PAPER SIZE	SHEET NO.
20X30	S-009
SCALE	PROJECT NO.
AS SHOWN	SO-G-21-001



SECOND FLOOR FRAMING PLAN SHOWING FLEXURE ENHANCEMENT

1 / S-010 SCALE 1:100M

BEAM SCHEDULE	
2G2C	450X650
2G4B	450X650
2G8B	450X650
2G10	450X650
2G10A	450X650
2B2	250X500
2B3	250X500
2B5	200X400
2CB3	450X650

LEGEND :

- (A) – 1 LAYER, 200MM WIDTH SIKA WRAP @ TOP WITH 200MM STRIP SIKA WRAP (LATERAL)
- (B) – 1 LAYER, 200MM WIDTH SIKA WRAP @ BOTTOM WITH 200MM STRIP SIKA WRAP (LATERAL)
- (C) – 1 LAYER, 450MM WIDTH SIKA WRAP @ TOP WITH 450MM STRIP SIKA WRAP (LATERAL)
- (D) – 1 LAYER, 450MM WIDTH SIKA WRAP @ BOTTOM WITH 450MM STRIP SIKA WRAP (LATERAL)
- (E) – 1 LAYER, 450MM WIDTH SIKA WRAP @ TOP
- (F) – 1 LAYER, 450MM WIDTH SIKA WRAP @ BOTTOM

RETROFITTING

a.c.ong CONSULTING INC.
Engineering + Management
ISO 9001:2015 Certified

DESIGNED BY: ALDEN C. ONG, M. Eng. ASEP, ENGINEER
REG. NO.: 88251
TIN NO.: 168-050-786
PTR NO.: 8539952
DATE: JANUARY 08, 2021
PLACE: MAKATI CITY

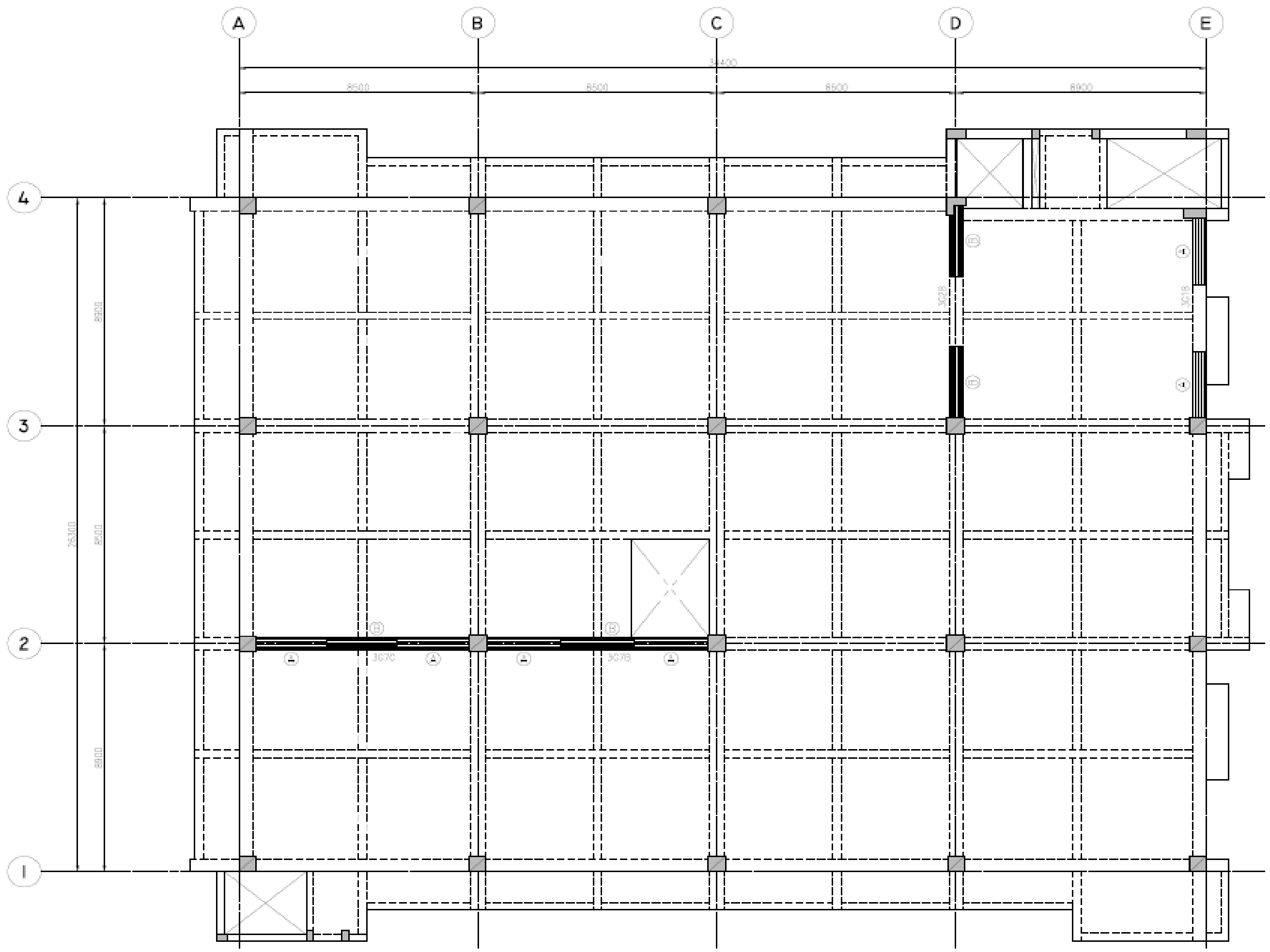
OWNER: SOCIAL SECURITY SYSTEM (SSS)
EAST AVENUE, DILIMAN, QUEZON CITY

CLIENT
APPROVED BY: EMMANUEL R. PALMA
SENIOR VICE PRESIDENT
MINDANAO OPERATIONS GROUP

PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING
J.P. LAUREL AVE., BAJADA, DAVAO CITY

SHEET CONTENTS: SECOND FLOOR FRAMING PLAN SHOWING FLEXURE ENHANCEMENT

CADD	DATE	NO.	REVISIONS	CHK	DATE	PAPER SIZE	SHEET NO.
LMG	FEB 2021					20X30	S-010
DESIGNED	DATE					SCALE	PROJECT NO.
FAG	FEB 2021					AS SHOWN	SO-G-21-001
APPROVED	DATE						
ACO	FEB 2021	0					



THIRD FLOOR FRAMING PLAN SHOWING FLEXURE ENHANCEMENT

1 / S-011 SCALE 1:100M

BEAM SCHEDULE	
3G1B	450X650
3G2B	450X650
3G7B	450X650
3G7C	450X650

LEGEND :

(A) – 1 LAYER, 250MM WIDTH SIKA WRAP @ TOP WITH 250MM STRIP SIKA WRAP (LATERAL)

(B) – 2 LAYERS, 250MM WIDTH SIKA WRAP @ TOP WITH 250MM STRIP SIKA WRAP (LATERAL)

RETROFITTING

a.c.ong CONSULTING INC.
Engineering + Management
ISO 9001:2015 Certified

DESIGNED BY: ALDEN C. ONG, M. Eng. ASEP
ENGINEER

REG. NO.: 88251
TIN NO. : 156-950-756
PTR NO. : 8538852
DATE : JANUARY 08, 2021
PLACE : MAKATI CITY

OWNER: SOCIAL SECURITY SYSTEM (SSS)
EAST AVENUE, DILIMAN, QUEZON CITY

CLIENT:
APPROVED BY:
EMMANUEL R. PALMA
SENIOR VICE PRESIDENT
MINDANAO OPERATIONS GROUP

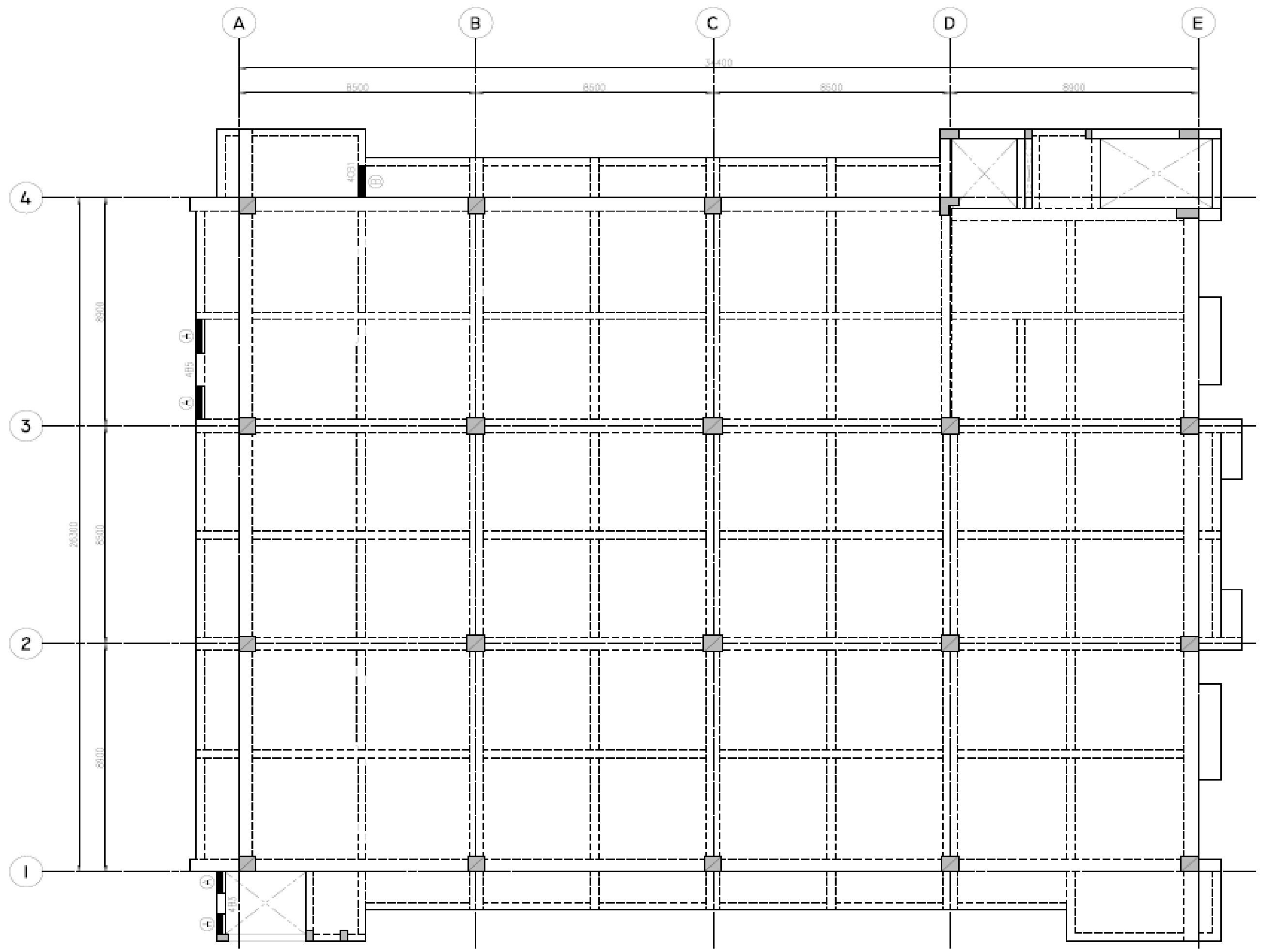
PROJECT TITLE/LOCATION:
PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING
J.P. LAUREL AVE., BAJADA, DAVAO CITY

SHEET CONTENTS:
THIRD FLOOR FRAMING PLAN SHOWING FLEXURE ENHANCEMENT

R.A. 9266 SEC. 33
DRAWINGS AND SPECIFICATIONS AND CONTRACT DOCUMENTS DULY SIGNED, STAMPED OR SEALED AS INSTRUMENTS FOR SERVICE ARE THE INTELLECTUAL PROPERTY AND DOCUMENTS OF ARCHITECT WHETHER THE OBJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. IT SHALL BE UNLAWFUL FOR ANY PERSON TO DUPLICATE OR TO MAKE COPIES OF SAID DOCUMENTS FOR USE IN THE REPETITION OF AND FOR OTHER PROJECTS OR BUILDINGS, WHETHER EXECUTED PARTLY OR IN WHOLE, WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT OR AUTHOR OF SAID DOCUMENTS.

CADD	DATE	NO.	REVISIONS	CHK	DATE
LRC	FEB 2021				
DESIGNED	DATE				
RAG	FEB 2021				
APPROVED	DATE				
ACO	FEB 2021	0			

PAPER SIZE: 20X30
SHEET NO.: S-011
SCALE: AS SHOWN
PROJECT NO.: SO-G-21-001



FOURTH FLOOR FRAMING PLAN SHOWING FLEXURE ENHANCEMENT

1 / S-012 SCALE 1:100M

BEAM SCHEDULE	
4B3	200X400
4B5	200X400
4CB1	250X500

LEGEND :

(A) – 1 LAYER, 200MM WIDTH SIKA WRAP @ TOP WITH 200MM STRIP SIKA WRAP (LATERAL)

(B) – 1 LAYER, 250MM WIDTH SIKA WRAP @ TOP WITH 250MM STRIP SIKA WRAP (LATERAL)

RETROFITTING

a.c.ong CONSULTING INC.
Engineering + Management
ISO 9001:2015 Certified

DESIGNED BY: ALDEN C. ONG, M.Eng. ASEP, ENGINEER
REG. NO.: 88251
TIN NO.: 188-950-786
PTR NO.: 8536952
DATE: JANUARY 08, 2021
PLACE: MAKATI CITY

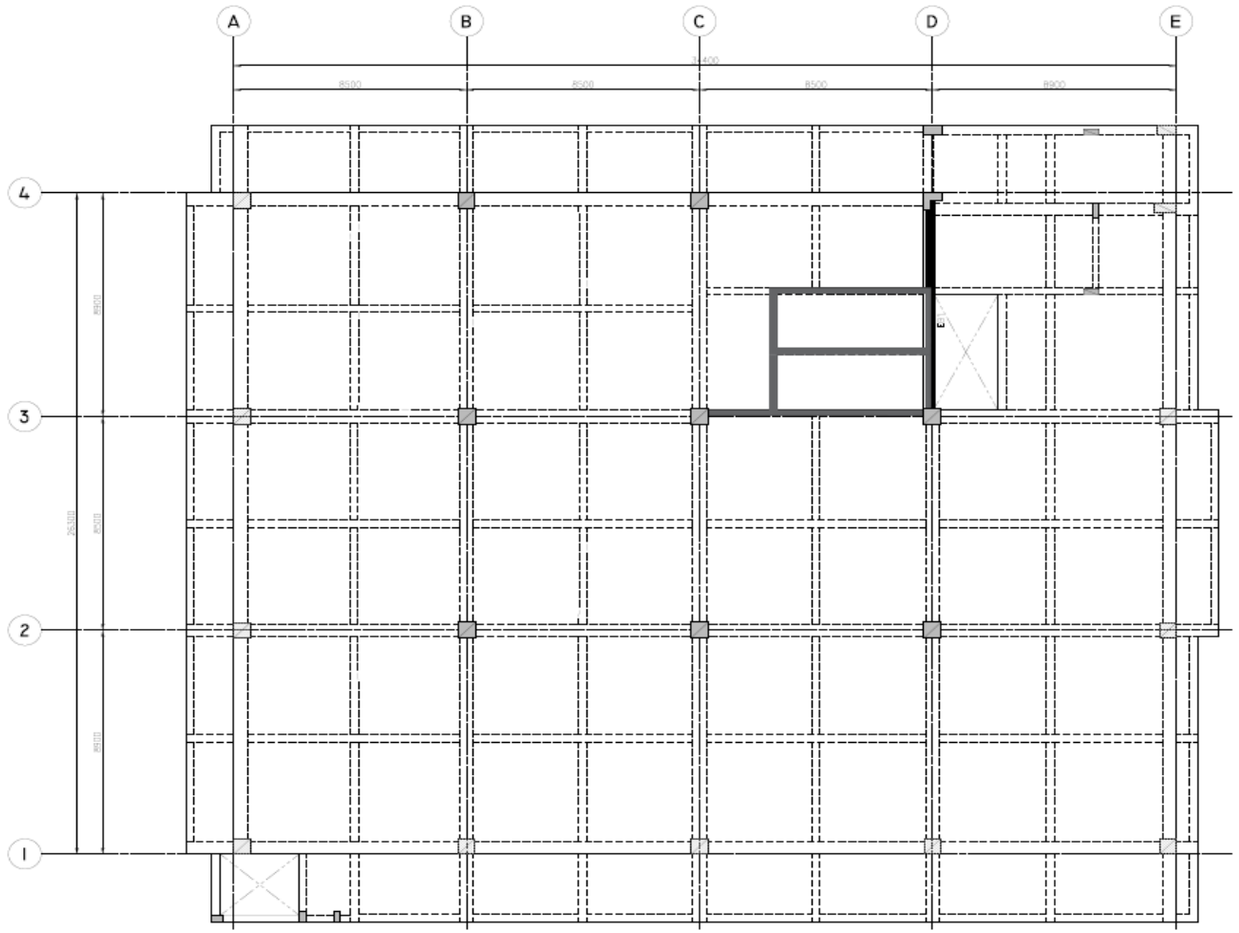
OWNER: SOCIAL SECURITY SYSTEM (SSS)
EAST AVENUE, DILIMAN, QUEZON CITY

CLIENT / APPROVED BY: EMMANUEL R. PALMA, SENIOR VICE PRESIDENT, MINDANAO OPERATIONS GROUP

PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING
J.P. LAUREL AVE., BAJADA, DAVAO CITY

SHEET CONTENTS: FOURTH FLOOR FRAMING PLAN SHOWING FLEXURE ENHANCEMENT

CADD	DATE	NO.	REVISIONS	CHK	DATE	PAPER SIZE	SHEET NO.
LMG	FEB 2021					20X30	S-012
DESIGNED	DATE						
RAG	FEB 2021					SCALE	PROJECT NO.
APPROVED	DATE					AS SHOWN	SO-G-21-001
ACO	FEB 2021	0					



ROOF DECK FRAMING PLAN
SHOWING FLEXURE ENHANCEMENT

1 — SCALE 1:100

LEGEND :

B1 – BEAM ENLARGEMENT

a.C.ONG CONSULTING INC. Engineering + Management ISO 9001:2015 Certified	PREPARED BY : MARY JANE C. SUBIJANO ENGINEER	OWNER: SOCIAL SECURITY SYSTEM (SSS)	PROJECT TITLE / LOCATION: SSS DAVAO BRANCH BLDG	SHEET CONTENTS: ROOF DECK FRAMING PLAN SHOWING FLEXURE ENHANCEMENT	R.A. 9266 SEC. 33	CADD	DATE	NO.	REVISIONS	BY	DATE	PAPER SIZE: 20X30	SHEET NO.: S-013
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						CHECKED	DATE						
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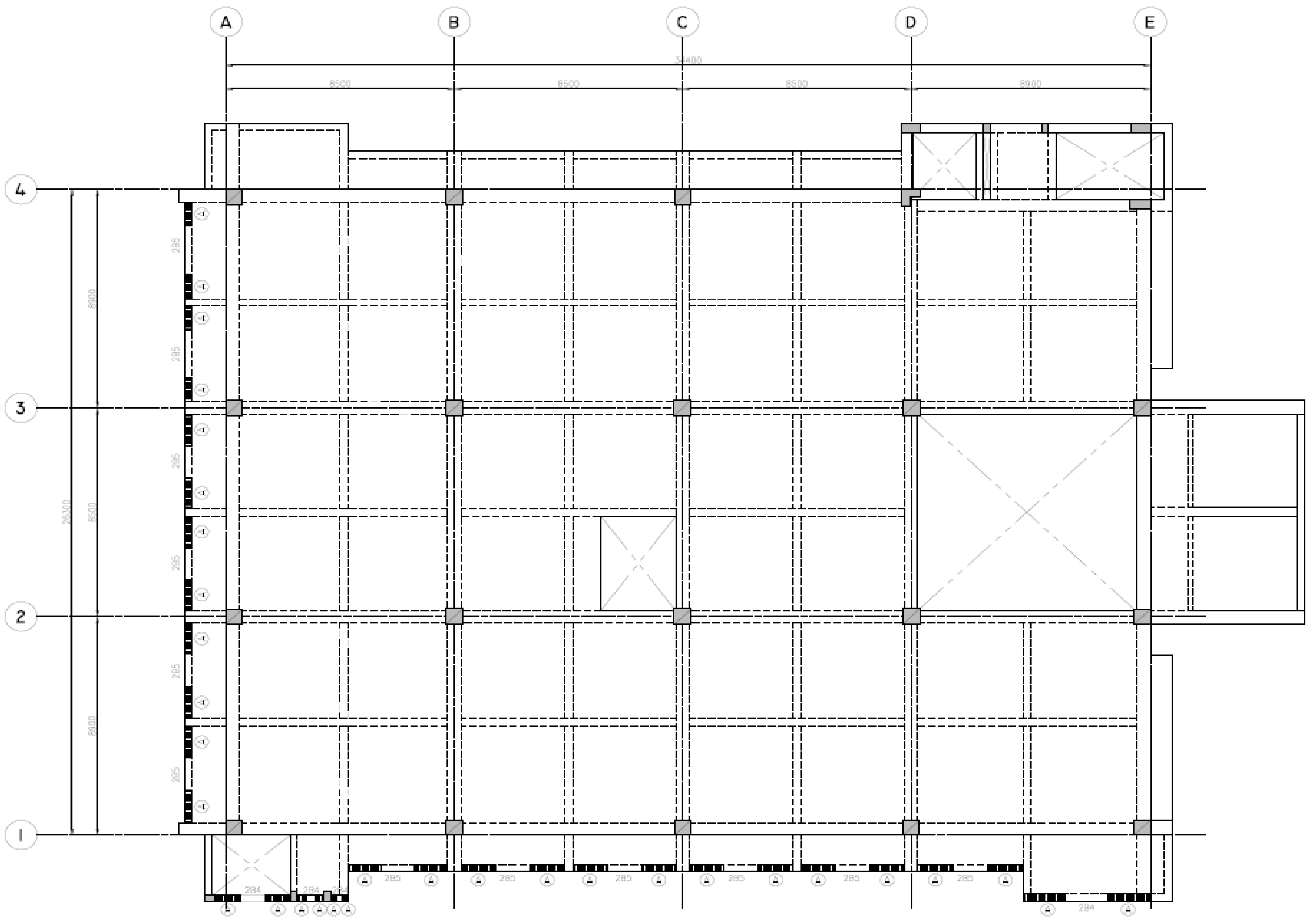
						ACD	REV 2021						



SECOND FLOOR FRAMING PLAN SHOWING SHEAR ENHANCEMENT

1 / S-014 SCALE 1:100M

BEAM SCHEDULE	
2B4	200X400
2B5	200X400

LEGEND :

(A) — 1 LAYER, U-WRAP OF SIKA WRAP 300C (SHEAR)

RETROFITTING

a.c.ong CONSULTING INC.
Engineering + Management
ISO 9001:2015 Certified

DESIGNED BY
ALDEN C. ONG, M.Eng. ASEP
ENGINEER
REG. NO.: 68251
TIN NO. : 188-050-786
PTR NO. : 8536852
DATE : JANUARY 08, 2021
PLACE : MAKATI CITY

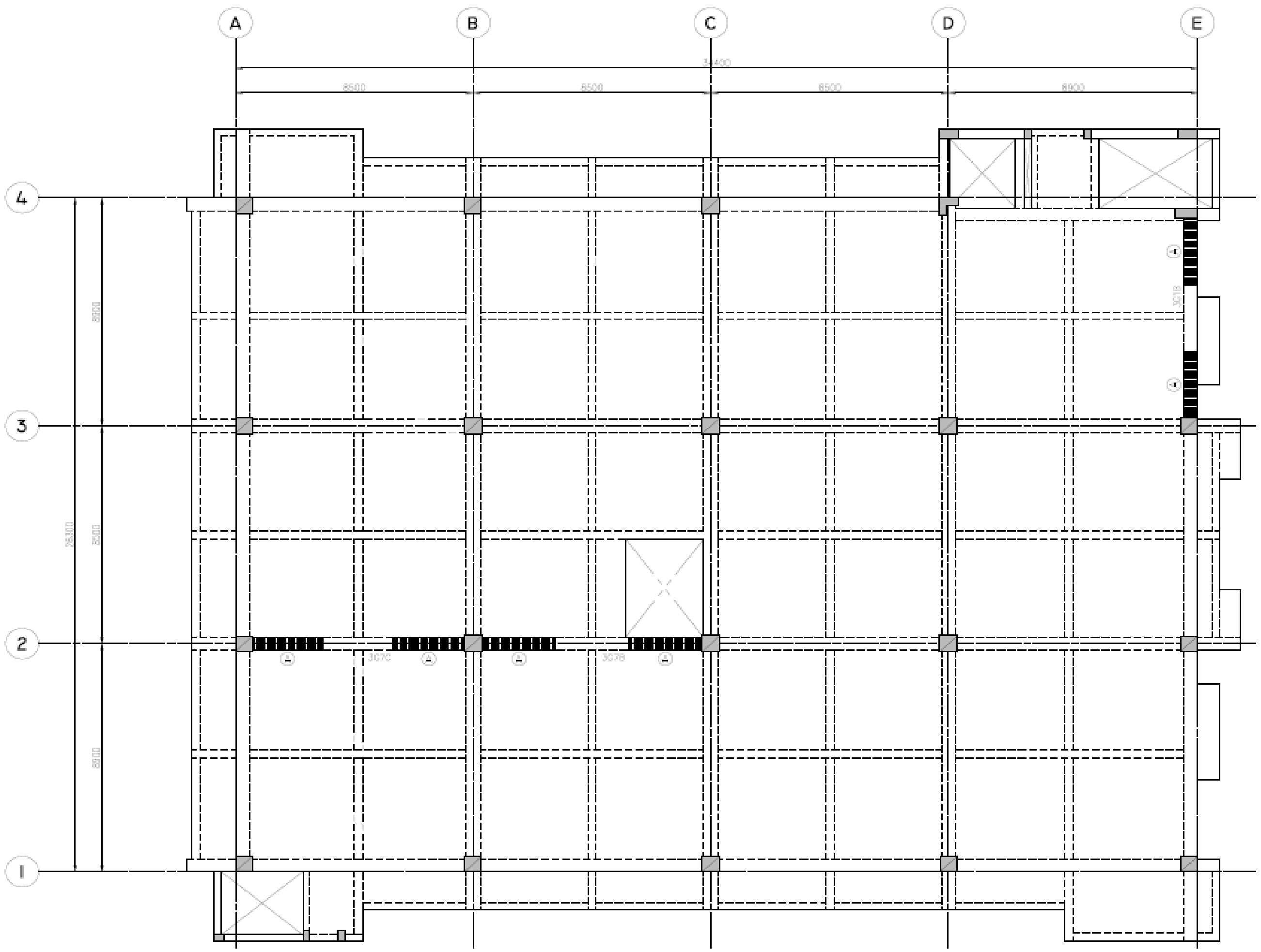
OWNER
SOCIAL SECURITY SYSTEM (SSS)
EAST AVENUE, DILIMAN, QUEZON CITY

CLIENT
APPROVED BY:
EMMANUEL R. PALMA
SENIOR VICE PRESIDENT
MINDANAO OPERATIONS GROUP

PROJECT TITLE/LOCATION
PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING
J.P. LAUREL AVE., BAJADA, DAVAO CITY

SHEET CONTENTS
SECOND FLOOR FRAMING PLAN SHOWING SHEAR ENHANCEMENT

CADD	DATE	NO.	REVISIONS	CHK	DATE	PAPER SIZE	SHEET NO.
LWG	FEB 2021					20X30	S-014
DESIGNED	DATE					SCALE	PROJECT NO.
PAG	FEB 2021					AS SHOWN	SO-G-21-001
APPROVED	DATE						
ACO	FEB 2021	0					



BEAM SCHEDULE	
3G1B	450X650
3G7B	450X650
3G7C	450X650

THIRD FLOOR FRAMING PLAN SHOWING SHEAR ENHANCEMENT

1 — S-015 — SCALE 1:100M

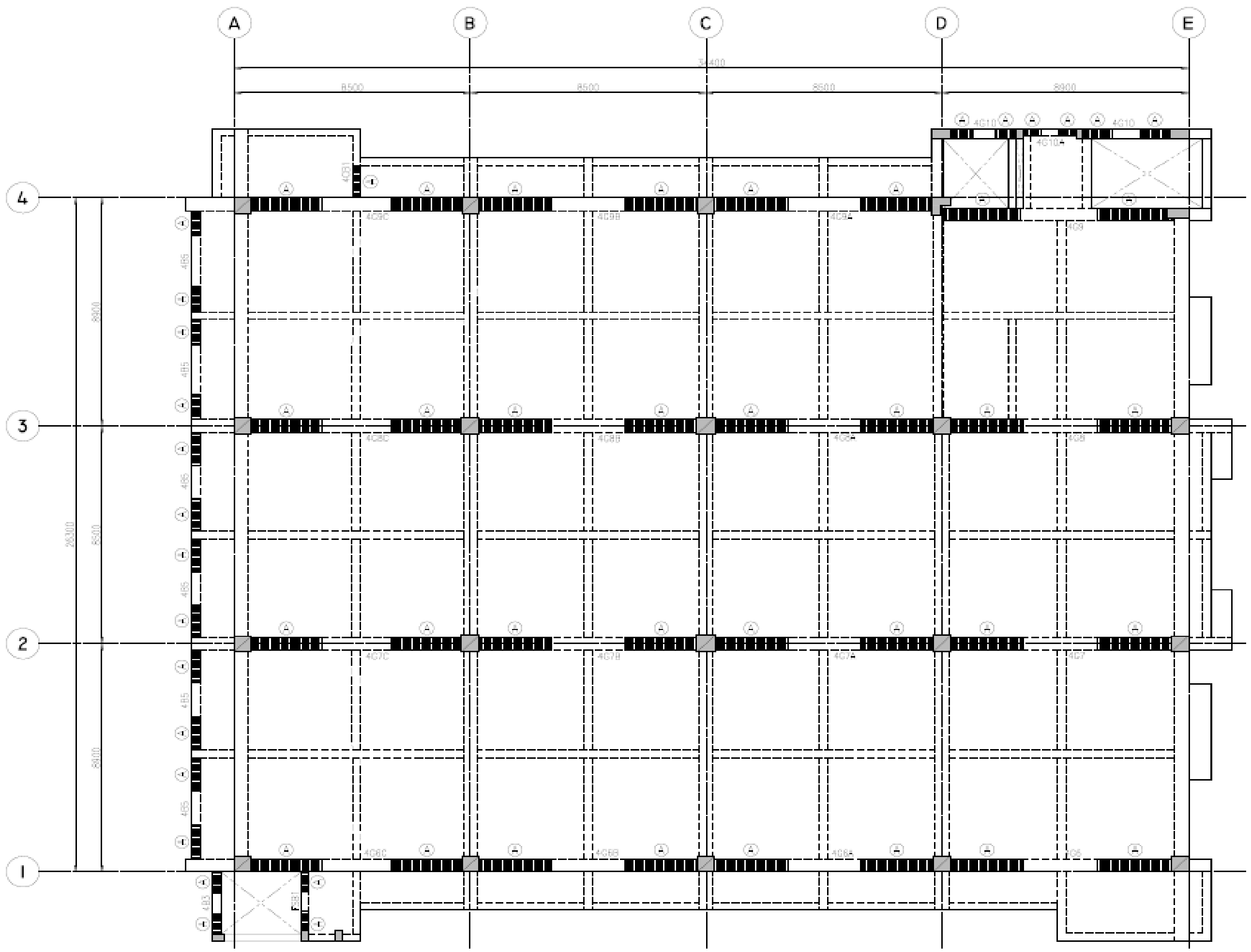
LEGEND :

(A) – 1 U-WRAP OF SIKA WRAP 300C (SHEAR)

RETROFITTING

a.c.ong CONSULTING INC. Engineering + Management ISO 9001:2015 Certified	DESIGNED BY: ALDEN C. ONG, M. Eng. ASEP, ENGINEER	REG. NO.: 88251; TIN NO.: 158-050-786; PTR NO.: 8538852; DATE: JANUARY 08, 2021; PLACE: MAKATI CITY	OWNER: SOCIAL SECURITY SYSTEM (SSS), EAST AVENUE, DILIMAN, QUEZON CITY	CLIENT: APPROVED BY: EMMANUEL R. PALMA, SENIOR VICE PRESIDENT, MINDANAO OPERATIONS GROUP	PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING, J.P. LAUREL AVE., DAVAO CITY	SHEET CONTENTS: THIRD FLOOR FRAMING PLAN SHOWING SHEAR ENHANCEMENT

CADD	DATE	NO.	REVISIONS	CHK	DATE	PAPER SIZE	SHEET NO.
LMG	FEB 2021					20X30	S-015
DESIGNED	DATE					SCALE	PROJECT NO.
RAG	FEB 2021					AS SHOWN	SO-G-21-001
APPROVED	DATE						
ACO	FEB 2021	0					



FOURTH FLOOR FRAMING PLAN SHOWING SHEAR ENHANCEMENT

1 S-016 SCALE 1:100M

BEAM SCHEDULE	
4G6	450X650
4G6A	450X650
4G6B	450X650
4G6C	450X650
4G7	450X650
4G7A	450X650
4G7B	450X650
4G7C	450X650
4G8	450X650
4G8A	450X650
4G8B	450X650
4G8C	450X650
4G9	450X650
4G9A	450X650
4G9B	450X650
4G9C	450X650
4G10	450X650
4G10A	450X650
4CG1	450X650
4CG8	450X650
4CG10	450X650
4B3	200X400
4B5	200X400
FSB1	250X500

LEGEND :

(A) – 1 U-WRAP OF SIKA WRAP 300C (SHEAR)

RETROFITTING

a.c.ONG CONSULTING INC.
Engineering + Management
ISO 9001:2015 Certified

DESIGNED BY: ALDEN C. ONG, M.Eng. ASEP, ENGINEER
REG. NO.: 58251
TIN NO.: 186-950-786
PTR NO.: 8539852
DATE: JANUARY 08, 2021
PLACE: MAKATI CITY

OWNER: SOCIAL SECURITY SYSTEM (SSS)
EAST AVENUE, DILIMAN, QUEZON CITY

CLIENT
APPROVED BY: EMMANUEL R. PALMA
SENIOR VICE PRESIDENT
MINDANAO OPERATIONS GROUP

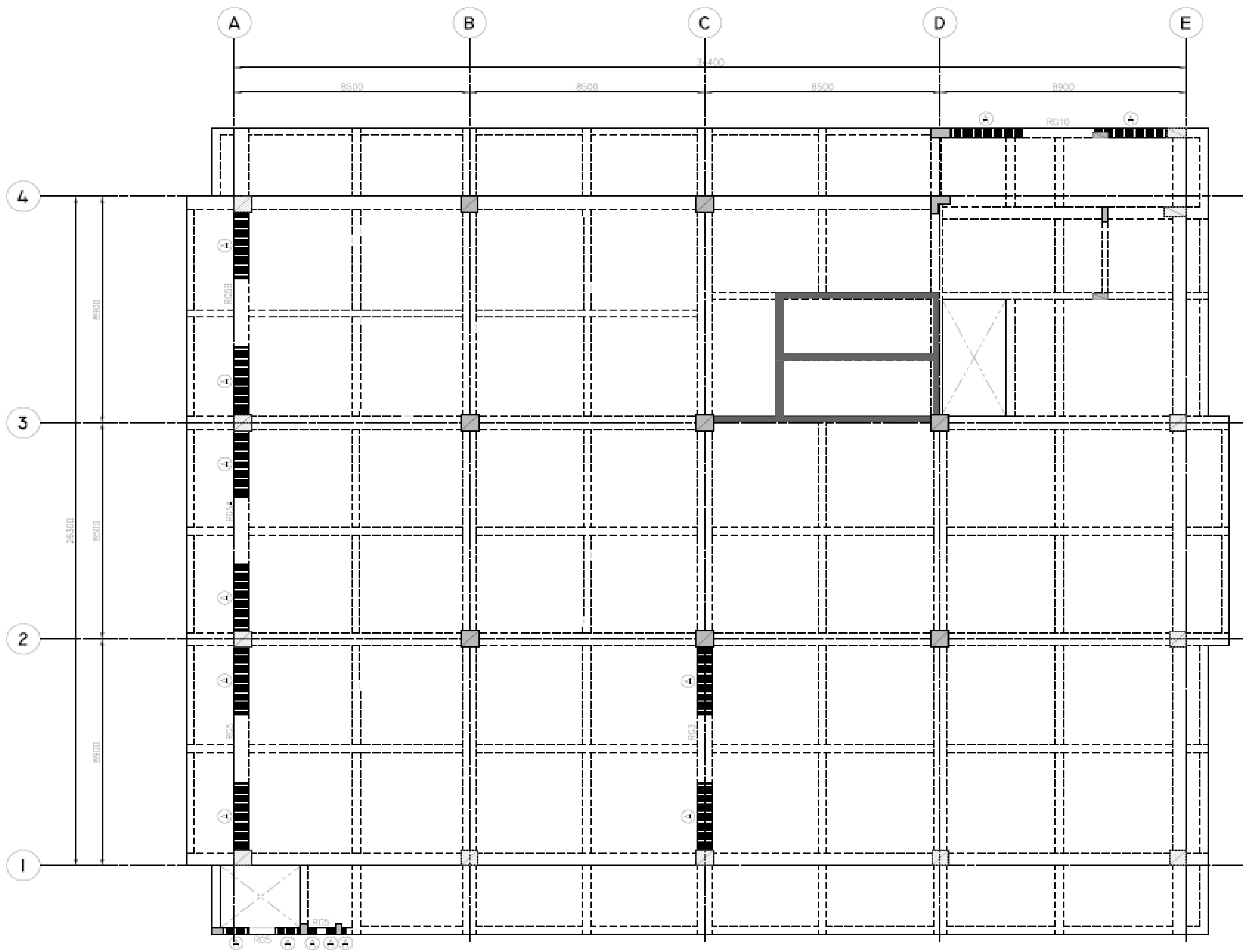
PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING
J.P. LAUREL AVE., BAJADA, DAVAO CITY

SHEET CONTENTS: FOURTH FLOOR FRAMING PLAN SHOWING SHEAR ENHANCEMENT

R.A. 9266 SEC. 33

CADD	DATE	NO.	REVISIONS	CHK	DATE
LMG	FEB 2021				
DESIGNED	DATE				
PAG	FEB 2021				
APPROVED	DATE				
ACO	FEB 2021	0			

PAPER SIZE: 20X30
SHEET NO.: S-016
SCALE: AS SHOWN
PROJECT NO.: SO-G-21-001



ROOF DECK FRAMING PLAN SHOWING SHEAR ENHANCEMENT

1 / S-017

SCALE 1:100M

BEAM SCHEDULE	
RG3	450X650
RG5	450X650
RG5A	450X650
RG5B	450X650
RG10	450X650

LEGEND :

(A) – 1 U-WRAP OF SIKA WRAP 300C (SHEAR)

RETROFITTING

a.c.ong CONSULTING INC.
Engineering + Management
ISO 9001:2015 Certified

DESIGNED BY: ALDEN C. ONG, M.Eng. ASEP, ENGINEER
REG. NO. : 88251
TIN NO. : 158-950-788
PTR NO. : 8538852
DATE : JANUARY 08, 2021
PLACE : MAKATI CITY

OWNER: SOCIAL SECURITY SYSTEM (SSS)
EAST AVENUE, DILIMAN, QUEZON CITY

CLIENT: APPROVED BY: EMMANUEL R. PALMA, SENIOR VICE PRESIDENT, MINDANAO OPERATIONS GROUP

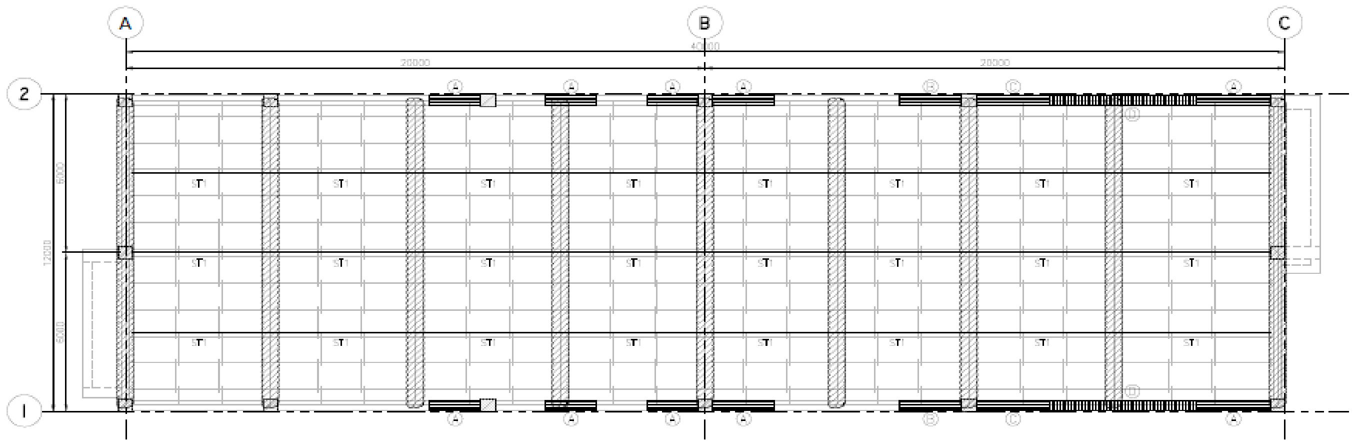
PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING
J.P. LAUREL AVE., BAJADA, DAVAO CITY

SHEET CONTENTS: ROOF DECK FRAMING PLAN SHOWING SHEAR ENHANCEMENT

R.A. 9266 SEC. 33
[illegible]

CADD	DATE	NO.	REVISIONS	CHK	DATE
LMG	FEB 2021				
DESIGNED	DATE				
RAG	FEB 2021				
APPROVED	DATE				
ACO	FEB 2021	0			

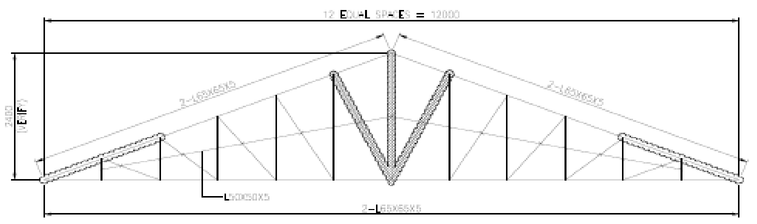
PAPER SIZE	SHEET NO.
20X30	S-017
SCALE	PROJECT NO.
AS SHOWN	SO-G-21-001



LEGEND :
- Ⓐ – 1 LAYER, 300MM SIKA WRAP 300C @ TOP
- Ⓑ – 1 LAYER, 300MM SIKA WRAP 600C @ TOP
- Ⓒ – 2 LAYERS, 300MM SIKA WRAP 600C @ TOP
- Ⓓ – 1 LAYER, 300MM SIKA WRAP 300C @ BOTTOM
- (hatched) – T1 FOR RETROFITTING
- ST1 – ADDITIONAL 2LC100X50X20X3.0 BOX STRUT @ TOP & BOTTOM

1 ANNEX BUILDING ROOF FRAMING PLAN (SHOWING MEMBERS FOR RETROFITTING)

S-018 SCALE 1:100M

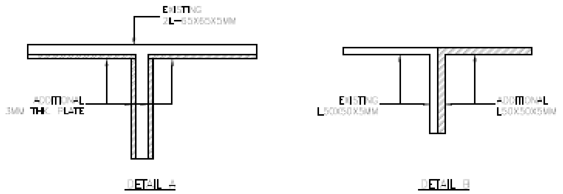


LEGEND :
- (unshaded) – SEE DETAIL A
- (shaded) – SEE DETAIL B

2 TI DIAGRAM SHOWING MEMBERS FOR RETROFITTING

S-018 SCALE 1:50M

SUMMARY OF BEAMS AND GIRDERS FOR RETROFITTING									
FLOOR LEVEL	RETROFITTING SYSTEM	MARK	SECTION		FLEXURE			SHEAR	GRID
			WIDTH	DEPTH	LEFT END	MIDSPAN	RIGHT END		
ROOF	FRP SYSTEM	RB2	300	550	–	–	1 LAYER 300MM SIKA WRAP 300C @ TOP	–	GL 1/A–B
		RB2	300	550	1 LAYER 300MM SIKA WRAP 300C @ TOP	–	1 LAYER 300MM SIKA WRAP 300C @ TOP	–	GL 1/A–B
		RB2	300	550	1 LAYER 300MM SIKA WRAP 300C @ TOP	–	1 LAYER 300MM SIKA WRAP 600C @ TOP	–	GL 1/A–B
		RB2	300	550	2 LAYERS 300MM SIKA WRAP 600C @ TOP	1 LAYER 300MM SIKA WRAP 300C @ BOT.	1 LAYER 300MM SIKA WRAP 300C @ TOP	–	GL 1/A–B
		RB2	300	550	–	–	1 LAYER 300MM SIKA WRAP 300C @ TOP	–	GL 2/A–B
		RB2	300	550	1 LAYER 300MM SIKA WRAP 300C @ TOP	–	1 LAYER 300MM SIKA WRAP 300C @ TOP	–	GL 2/A–B
		RB2	300	550	1 LAYER 300MM SIKA WRAP 300C @ TOP	–	1 LAYER 300MM SIKA WRAP 600C @ TOP	–	GL 2/A–B
		RB2	300	550	2 LAYERS 300MM SIKA WRAP 600C @ TOP	1 LAYER 300MM SIKA WRAP 300C @ BOT.	1 LAYER 300MM SIKA WRAP 300C @ TOP	–	GL 2/A–B



3 TRUSS MEMBERS RETROFITTING DETAILS

S-018 SCALE 1:40M

RETROFITTING

a.c.ong CONSULTING INC.
Engineering + Management
ISO 9001:2015 Certified

DESIGNED BY: ALDEN C. ONG, M.Eng. ASEP, ENGINEER
REG. NO.: 88251
TIN NO.: 166-950-786
PTR NO.: 8536952
DATE: JANUARY 08, 2021
PLACE: MAKATI CITY

OWNER: SOCIAL SECURITY SYSTEM (SSS)
EAST AVENUE, DILIMAN, QUEZON CITY

CLIENT / APPROVED BY: EMMANUEL R. PALMA
SENIOR VICE PRESIDENT
MINDANAO OPERATIONS GROUP

PROJECT TITLE/LOCATION: PROPOSED STRUCTURAL RETROFITTING OF SSS DAVAO BUILDING
J.P. LAUREL AVE., BAJADA, DAVAO CITY

SHEET CONTENTS:
ANNEX BUILDING ROOF FRAMING PLAN (SHOWING MEMBERS FOR RETROFITTING)
T1 DIAGRAM SHOWING MEMBERS FOR RETROFITTING
TRUSS MEMBERS RETROFITTING DETAILS

CADD	DATE	NO.	REVISIONS	CHK	DATE
LMG	FEB 2021				
DESIGNED	DATE				
PAG	FEB 2021				
APPROVED	DATE				
ACO	FEB 2021	0			

PAPER SIZE: 20X30
SHEET NO.: S-018
SCALE: AS SHOWN
PROJECT NO.: SO-G-21-001

Section VIII. Bill of Quantities

SSS Form No. _____

Republic of the Philippines
SOCIAL SECURITY SYSTEM
East Avenue, Diliman, Quezon City
ENGINEERING AND FACILITIES MANAGEMENT DEPARTMENT

PROJECT : **RETROFITTING OF SSS DAVAO BUILDING**
LOCATION : J.P. Laurel Ave., Bajada, Davao City

Date:

BILL OF QUANTITIES

ITEM NO.	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR & EQPT		MOB./ DEMOB.	TOTAL DIRECT COST	MARK-UP	VAT	TOTAL COST
				UNIT COST	AMOUNT	UNIT COST	AMOUNT					
(A)	(B)	(C)	(D)	(E)	(F) C x E	(G)	(H) C x G	(I) % * (F+H)	(J) F + H + I	(K) % x I	(L) % x (I + J)	(M) I + J + K
I	**RELOCATION OF AFFECTED EMPLOYEES' WORKSTATIONS AND OTHERS**											
1.0	**Cost of relocation of affected employees' work stations.**											
1.1	Relocation of furniture, equipment and documents affected including dismantling and all other works needed.	1.00	lot	0.00	0.00		0.00		0.00		0.00	0.00
1.2	Provision of new power outlets	1.00	lot		0.00		0.00		0.00		0.00	0.00
1.3	Provision of voice and data	1.00	lot		0.00		0.00		0.00		0.00	0.00
	TOTAL COST – RELOCATION OF AFFECTED EMPLOYEES' WORKSTATIONS AND OTHERS				**0.00**		**0.00**		**0.00**			**0.00**
II	**STRUCTURAL RETROFITTING**											
1.0	**General Requirements**											
1.1	Permits/Clearances and Other Government Taxes (Permit fees and expenses for processing of building permit and occupancy certification, BFP clearance, etc. including construction plans and as-built plans for permit purposes)	1.00	lot	0.00	0.00		0.00		0.00		0.00	0.00
1.2	Temporary Facilities	1.00	lot		0.00		0.00		0.00		0.00	0.00
1.3	Temporary Utilities (water and electricity)	1.00	lot	- To be provided by the Owner -								
1.4	Safety Requirements (DOLE - approved CHSP, PPE, dust barrier, safety nets/fall protection, board-up, safety signage/devices, floor coverings, etc.	1.00	lot		0.00		0.00		0.00		0.00	0.00
1.5	Closing-out Requirements (Signed and Sealed as-built retrofitting plans with minor civil-achitectural plans relative to restoration works i.e. fllor plans, elevations/sections)	1.00	lot	0.00	0.00		0.00		0.00		0.00	0.00
1.6	Site cleaning/clearing and hauling/disposal of construction debris, excess materials, contractor's garbage, etc.	1.00	lot	0.00	0.00		0.00		0.00		0.00	0.00
	SUBTOTAL COST – GENERAL REQUIREMENTS				**0.00**		**0.00**		**0.00**			**0.00**
2.0	**Structural Retrofitting Works**											
2.1	Enlargement of Column Section (Foundation to Roof)											
2.1.1	Removal of CHB partition walls	381.60	sq.m.		0.00		0.00		0.00		0.00	0.00
2.1.2	Earthworks - Structural Excavation	127.54	cu.m.		0.00		0.00		0.00		0.00	0.00
2.1.3	Earthworks - Backfilling and Compaction	109.70	cu.m.		0.00		0.00		0.00		0.00	0.00
2.1.4	Hauling and disposal of unnecessary debris	17.84	cu.m.		0.00		0.00		0.00		0.00	0.00
2.1.5	Chipping works	1.00	lot		0.00		0.00		0.00		0.00	0.00
2.1.6	Concreting Works											
	Concrete forms and accessories	695.30	sq.m.		0.00		0.00		0.00		0.00	0.00
	Concrete reinforcement	49,321.28	kgs		0.00		0.00		0.00		0.00	0.00
	Cast-in-place concrete	61.30	cu.m.		0.00		0.00		0.00		0.00	0.00
2.1.7	Application of cement plaster to finish on enlarged columns	695.30	sq.m.		0.00		0.00		0.00		0.00	0.00
2.1.8	Painting of column surfaces (enlarged columns)	695.30	sq.m.		0.00		0.00		0.00		0.00	0.00
2.1.9	Restoration of affected CHB partition and other finishes/surfaces	381.60	sq.m.		0.00		0.00		0.00		0.00	0.00

ITEM NO.	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR & EQPT		MOB./ DEMOB.	TOTAL DIRECT COST	MARK-UP	VAT	TOTAL COST
				UNIT COST	AMOUNT	UNIT COST	AMOUNT					
	2.2 Enlargement of Beam Section (Roofdeck Flexure Enhancement)											
	2.2.1 Removal of CHB partition walls	22.25	sq.m.		0.00		0.00		0.00		0.00	0.00
	2.2.2 Concreting Works											
	Concrete forms and accessories	19.58	sq.m.		0.00		0.00		0.00		0.00	0.00
	Concrete reinforcement	400.95	kgs		0.00		0.00		0.00		0.00	0.00
	Cast-in-place concrete	1.87	cu.m.		0.00		0.00		0.00		0.00	0.00
	2.2.3 Application of cement plaster to finish on enlarged columns	22.25	sq.m.		0.00		0.00		0.00		0.00	0.00
	2.2.4 Painting of column surfaces (enlarged columns)	22.25	sq.m.		0.00		0.00		0.00		0.00	0.00
	2.2.5 Restoration of affected CHB partition and other finishes/surfaces	22.25	sq.m.		0.00		0.00		0.00		0.00	0.00
	2.3 Fiber-reinforced Polymer System											
	2.3.1 FRP - Beams/Girder (Second to Roofdeck)											
	2.3.1.1 Removal of CHB partition walls	137.23	sq.m.		0.00		0.00		0.00		0.00	0.00
	2.3.1.2 Removal of mortar cement plaster	274.47	sq.m.		0.00		0.00		0.00		0.00	0.00
	2.3.1.3 Application of Structural Epoxy for cracks and uneven surface under abnormal condition/ Application of concrete repair by epoxy injection, if any	29.43	gals.		0.00		0.00		0.00		0.00	0.00
	2.3.1.4 Surface preparation and related works	420.39	sq.m.		0.00		0.00		0.00		0.00	0.00
	2.3.1.5 Application of FRP system											
	-Adhesive/Polymers:											
	Sikadur 300		kgs		0.00		0.00		0.00		0.00	0.00
	Sikadur 330	294.27	kgs		0.00		0.00		0.00		0.00	0.00
	Flexure Fiber (CFRP Wrap 600g/sqm) - 1 layer	62.58	sq.m.		0.00		0.00		0.00		0.00	0.00
	Flexure Fiber (CFRP Wrap 600g/sqm) - 2 layers	10.93	sq.m.		0.00		0.00		0.00		0.00	0.00
	Flexure Fiber (CFRP Wrap 300g/sqm) - 1 layer	346.89	sq.m.		0.00		0.00		0.00		0.00	0.00
	2.3.1.6 Restoration of CHB partition and other affected areas/ finishes/ fixtures including plastering cover or topcoat finish for composite retrofitting materials	137.23	sq.m.		0.00		0.00		0.00		0.00	0.00
	2.3 Restoration of affected Architectural, Mechanical, Electrical, Fire Protection, Sanitary Works and others.	1.00	lot	0.00	0.00		0.00		0.00		0.00	0.00
	SUBTOTAL COST – STRUCTURAL RETROFITTING				**0.00**		**0.00**		**0.00**			**0.00**
3.0	**Miscellaneous Items**											
	3.1 Equipment rental/expenses during construction/lifting	1.00	lot	0.00	0.00		0.00		0.00		0.00	0.00
	3.2 Scaffolding for enlargement of columns and application of FRP system	1.00	lot		0.00		0.00		0.00		0.00	0.00
	3.3 Mobilization/demobilization (Expenses for mobilization/demobilization of site office equipment, technical personnel and equipment to be used during construction/retrofitting)	1.00	lot	0.00	0.00		0.00		0.00		0.00	0.00
	SUBTOTAL COST – MISCELLANEOUS ITEMS				**0.00**		**0.00**		**0.00**			**0.00**
	TOTAL COST				**0.00**		**0.00**		**0.00**			**0.00**

ITEM NO.	DESCRIPTION	QTY	UNIT	MATERIALS		LABOR & EQPT		MOB./ DEMOB.	TOTAL DIRECT COST	MARK-UP	VAT	TOTAL COST
				UNIT COST	AMOUNT	UNIT COST	AMOUNT					

GENERAL CONDITIONS

1. For uniformity and evaluation purposes, a bidder shall adhere to the herein prescribed format of BOQ, specifically in the formula for computation, given quantity and exclusive pay items. Any deviation from the format shall be a ground for disqualification of bid.

   1.1 Fill up all required items/field in the BOQ. Failure to indicate any of the following shall mean outright disqualification since bid is considered Non-responsive:
   * if item is given for free, indicate dash (-), zero (0) or free
   * If the item is not applicable, indicate N/A

2. Each bidder shall be provided with hard copy of the BOQ Form (attached in the PBD) and an electronic copy for faster and easier encoding. The hard copy shall serve as the bidder's reference as to completeness of work items, quantity, formula, format, etc. in the BOQ Form considering that the electronic copy is prone to alterations during encoding. Any discrepancy on the contents (specially on the quantity and inclusive pay items) between the hard copy and electronic, the contents of the hard copy shall prevail.

3. Bidder are not allowed to include any pay items that were not indicated in the form supplied Bill of Quantities. In instances where necessary work items are inadvertently left out in BOQ Form, a bidder should make a written query to the Bids and Awards Committee so that the same shall be addressed in the Bid Bulletin which will be issued to all participating bidders.
4. All documents must be signed, and each and every page thereof must be initialed by the duly authorized representative/s of the Bidder per Section II. Instructions to Bidders, Item 19.4.
5. Unit Price of the Furniture Item shall include the following:
   5.1 Materials, fabrication and installation costs
   5.2 Overhead expenses such as office expenses, supervision, transportation allowances, and financing costs (Premium on CARI, Bid Security, Performance Security, Surety for advance payment, Warranty bond)
   5.3 Contingencies, Miscellaneous Expenses and Contractor's Profit margin
6. It is the responsibility of the Bidder to check the arithmetical computation provided herein.

Submitted by: _____
(Name of Bidder / Company Name)

Prepared by: _____
(Company Representative - Signature over printed name)

Address: _____

Telephone #: _____
Date: _____

Section IX. Checklist of Technical and Financial Documents

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

☐ (a) Valid PhilGEPS Certificate of Platinum Registration and Membership (Platinum Membership) (all pages);

Technical Documents

☐ (b) Statement of the prospective 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; **and**

☐ (c) Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules; and

☐ (d) 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; and

☐ (e) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission;
or
Original copy of Notarized Bid Securing Declaration; **and**

(f) Project Requirements, which shall include the following:

☐ a. Organizational chart for the contract to be bid;

☐ b. 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;

☐ c. 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; **and**

☐ (g) Original duly signed Omnibus Sworn Statement (OSS);
and if applicable, Original Notarized Secretary's Certificate in case of a corporation, partnership, or cooperative; or Original Special Power of Attorney of all members of the joint venture giving full power and authority to its officer to sign the OSS and do acts to represent the Bidder.

Financial Documents

☐ (h) 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; **and**

☐ (i) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC).

Class "B" Documents

☐ (j) 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;
or
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.

II. FINANCIAL COMPONENT ENVELOPE

☐ (k) Original of duly signed and accomplished Financial Bid Form; **and**

Other documentary requirements under RA No. 9184

☐ (l) Original of duly signed Bid Prices in the Bill of Quantities; and

☐ (m) Duly accomplished Detailed Estimates Form, including a summary sheett indicating the unit prices of construction materials, labor rates, and equipment rentals used in coming up with the Bid; and

☐ (n) Cash Flow by Quarter.

IMPORTANT REMINDERS

A) Each and every page of the **Bid Forms**, under Section VIII: Checklist of Technical and Financial Documents hereof, shall be signed by the duly authorized representative/s of the Bidder. Failure to do so shall be a ground for the rejection of the bid.

B) Any interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the duly authorized representative/s of the Bidder.

C) Bid documents shall be compiled in a folder/binder with the Annexes properly labeled with tabs/separators.

D) Bidders shall submit their bids through their duly authorized representative enclosed in separate sealed envelopes, which shall be submitted simultaneously:

a) The first three individually sealed envelopes shall contain the folder/binder of the Eligibility Requirements and Technical Component of the bid; prepared in three copies labeled as follows:

Envelop (1): ORIGINAL – Eligibility Requirements and Technical Component
Envelop (2): COPY1 – Eligibility Requirements and Technical Component
Envelop (3): COPY2 – Eligibility Requirements and Technical Component

b) The next three individually sealed envelopes shall contain the folder/binder of the Financial Component of the bid; prepared in three copies labeled as follows:

Envelop (4): ORIGINAL – Financial Component
Envelop (5): COPY1 – Financial Component
Envelop (6): COPY2 – Financial Component

c) Bidders shall enclose, seal and mark the following:

Envelop (7): Envelope (1) and Envelope (4) enclosed in one sealed envelope marked “ORIGINAL–BID”

Envelop (8): Envelope (2) and Envelope (5) enclosed in one sealed envelope marked “COPY1–BID”

Envelop (9): Envelope (3) and Envelope (6) enclosed in one sealed envelope marked “COPY2–BID”

d) Envelopes (7) to (9) shall then be enclosed in a single sealed, signed final/outer envelope/package/box

e) All envelopes (Envelopes (1) to (9) and the final/outer envelope/package/box) shall indicate the following:

- addressed to the Procuring Entity's BAC
- name and address of the Bidder in capital letters
- name of the contract/project to be bid in capital letters
- bear the specific identification/reference code of this bidding process
- bear a warning "DO NOT OPEN BEFORE…" the date and time for the opening of bids

THE CHAIRPERSON

BIDS AND AWARDS COMMITTEE

2ND FLOOR, SSS MAIN BUILDING

EAST AVENUE, DILIMAN, QUEZON CITY

NAME OF BIDDER : _____

ADDRESS : _____

E) Bids submitted after the deadline shall only be marked for recording purpose, shall not be included in the opening of bids, and shall be returned to the bidder unopened.

F) Bidders shall submit a copy of the Authority to Notarize issued by the Regional Trial Court to the Notarial Public.

FORMS

FORM-01

Bid Form for the Procurement of Infrastructure Projects

BID FORM

RETROFITTING OF SSS DAVAO BUILDING

Date:_____
Project Identification No.: _____

To: **SOCIAL SECURITY SYSTEM**
East Avenue, Diliman, Quezon City

Having examined the Philippine Bidding Documents (PBDs) including the Supplemental or Bid Bulletin Numbers [insert 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: (Insert name of contract);

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: (insert information);

d. The discounts offered and the methodology for their application are: (insert information);

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 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 [insert percentage amount] 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 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/conform 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 the (Name of Project) of the [Name of the Procuring Entity].

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: _____

GPPB Resolution No. 16-2020, dated 16 September 2020

FORM-02

Bid Securing Declaration Form

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 thereof 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 hereunto 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]

GPPB Resolution No. 16-2020, dated 16 September 2020

FORM-03

Contract Agreement Form for the

Procurement of Infrastructure Projects (Revised)

[not required to be submitted with the Bid, but it shall be submitted within ten (10) days after receiving the Notice of Award]

CONTRACT AGREEMENT

RETROFITTING OF SSS-OWNED BUILDING - DAVAO

ITB-SSS-CIVIL-2022-___

THIS AGREEMENT made between:

SOCIAL SECURITY SYSTEM, a government-owned and controlled corporation created pursuant to Republic Act No. 11199, with principal office address at SSS Building, East Avenue, Diliman, Quezon City, represented herein by its Approving Authority and (Position of Approving Authority), (Name of Approving Authority) and (Position of Signatory), (Name of signatory), duly authorized pursuant to Administrative Order _____, _____ (pertaining to Approving Authority) (Annex “A”) and Office Order _____ , _____ (Annex “B”) (pertaining to signatories), hereinafter referred to as the “SSS”;

- a n d -

(NAME OF CONTRACTOR), of legal age, Filipino, single/married, with principal address at _____, hereinafter referred to as the “Contractor”.

If corporation

(NAME OF CONTRACTOR), a corporation duly created and existing pursuant to the laws of the Republic of the Philippines, with principal office address at _____, represented herein by its (Position of Signatory), (Name of Signatory), duly authorized pursuant to _____, _____, hereinafter referred to as the “Contractor”.

WHEREAS, the Entity is desirous that the Contractor execute [name and identification number of contract] (hereinafter called “the Works”) and the Entity has accepted the Bid for [contract price in words and figures in specified currency] by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.

2. The following documents as required by the 2016 revised Implementing Rules and Regulations of Republic Act No. 9184 shall be deemed to form and be read and construed as integral part of this Agreement, *viz.*:

a. Philippine Bidding Documents (PBDs);
   i. Drawings/Plans;
   ii. Specifications;
   iii. Bill of Quantities;
   iv. General and Special Conditions of Contract;
   v. Supplemental or Bid Bulletins, if any

b. Contractor's bidder's bid, including the Eligibility requirements, Technical and Financial Proposals, and all other documents or statements submitted;

   Bid form, including all the documents/statements contained in the Bidder's bidding envelopes, as annexes, and all other documents submitted (*e.g.*, Bidder's response to request for clarifications on the bid), including corrections to the bid, if any, resulting from the Procuring Entity's bid evaluation;

c. Performance Security;

d. Notice of Award of Contract; and the Bidder's conforme thereto; and

e. Other contract documents that may be required by existing laws and/or the Procuring Entity concerned in the PBDs. **Winning bidder agrees thatadditional contract documents or information prescribed by the GPPBthat are subsequently required for submission after the contractexecution, such as the Notice to Proceed, Variation Orders, andWarranty Security, shall likewise form part of the Contract.**

3. In consideration for the sum of *[totalcontract price in words and figures]* or such other sums as may be ascertained, *[Named of the bidder]* agrees to *[state the object of the contract]* in accordance with his/her/its Bid.

4. The *SSS* agrees to pay the above-mentioned sum in accordance with the terms of the Bidding.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of the Republic of the Philippines on the day and year first above written.

[Insert Name and Signature]	*[Insert Name and Signature]*
[Insert Signatory's Legal Capacity]	*[Insert Signatory's Legal Capacity]*
for:	*for:*
SSS	*[Insert Name of Supplier]*

(In case of double acknowledgment)

SIGNED IN THE PRESENCE OF:

_____ _____

(Name of Certifying officer as to availability of funds)
(Position of Certifying Officer)
(Department/Office of Certifying Officer)

FUNDS AVAILABLE:

APP No.: _____

FIRST ACKNOWLEDGMENT

Republic of the Philippines)
_____…….) S.S.

BEFORE ME, a Notary Public for and in _____, Philippines, on this _____ day of _____ personally appeared:

Name	Competent Evidence of Identity	Date/Place of Issue

known to me to be the same person who executed the foregoing Agreement, consisting of _____ (___) pages, including this page and excluding annexes, and he/she/they acknowledged to me that the same is his/her/their free and voluntary act and deed as well as the free and voluntary act and deed of the principal he/she /they represent/s in this instance.

WITNESS MY HAND AND SEAL on the date and place first above written.

Doc. No. _____;
Page No. _____;
Book No. _____;
Series of 20__.

SIGNED IN THE PRESENCE OF:

_____ _____

SECOND ACKNOWLEDGMENT

Republic of the Philippines)
_____…….) S.S.

BEFORE ME, a Notary Public for and in _____, Philippines, on this _____ day of _____ personally appeared:

Name	Competent Evidence of Identity	Date/Place of Issue

known to me to be the same person who executed the foregoing Agreement, consisting of _____ (___) pages, including this page and excluding annexes, and he/she/they acknowledged to me that the same is his/her/their free and voluntary act and deed (if corporation to include succeeding phrase) as well as the free and voluntary act and deed of the principal he/she /they represent/s in this instance.

WITNESS MY HAND AND SEAL on the date and place first above written.

Doc. No. _____;
Page No. _____;
Book No. _____;
Series of 20__.

GPPB Resolution No. 16-2020, dated 16 September 2020

FORM-04

Omnibus Sworn Statement (Revised)

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 documents 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. *[Contractor]* 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 duly 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]

GPPB Resolution No. 16-2020, dated 16 September 2020

FORM-05

Performance Securing Declaration (Revised)

[As alternative performance security to be submitted by the winning bidder within ten (10) days from receipt of Notice of Award]

REPUBLIC OF THE PHILIPPINES)

CITY OF _____) S.S.

PERFORMANCE SECURING DECLARATION

Invitation to Bid: [Insert Reference Number indicated in the Bidding Documents] To: [Insert name and address of the Procuring Entity]

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, to guarantee the faithful performance by the supplier/distributor/manufacturer/contractor/consultant of its obligations under the Contract, I/we shall submit a Performance Securing Declaration within a maximum period of ten (10) calendar days from the receipt of the Notice of Award prior to the signing of the Contract.

2. I/We accept that: I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of one (1) year for the first offense, or two (2) years **for the second offense**, upon receipt of your Blacklisting Order if I/We have violated my/our obligations under the Contract;

3. I/We understand that this Performance Securing Declaration shall cease to be valid upon:

    a. issuance by the Procuring Entity of the Certificate of Final Acceptance, subject to the following conditions:
        i. Procuring Entity has no claims filed against the contract awardee;
        ii. It has no claims for labor and materials filed against the contractor; and
        iii. Other terms of the contract; or

    b. replacement by the winning bidder of the submitted PSD with a performance security in any of the prescribed forms under Section 39.2 of the 2016 revised IRR of RA No. 9184 as required by the end-user.

IN WITNESS WHEREOF, I/We have hereunto 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]

FORM-06

STATEMENT OF ALL ITS ON-GOING GOVERNMENT AND PRIVATE CONTRACTS, INCLUDING CONTRACTS AWARDED BUT NOT YET STARTED

NAME OF CONTRACT	DATE OF CONTRACT	CONTRACT DURATION	OWNER'S NAME, ADDRESS, CONTACT NUMBERS AND E-MAIL ADDRESS	KINDS OF GOODS	AMOUNT OF CONTRACT	VALUE OF OUTSTANDING CONTRACT	REMARKS (Indicate "With NDA" or "Without NDA")

NOTE: INCLUDING PROJECTS WITH NON-DISCLOSURE AGREEMENT (NDA)

FORM-07

STATEMENT OF SINGLE LARGEST COMPLETED CONTRACT SIMILAR TO THE PROJECT TO BE BID EQUIVALENT TO AT LEAST 50% OF THE ABC WITH ATTACHED SUPPORTING DOCUMENTS (i.e. P.O/CONTRACTS)

NAME OF CONTRACT	KINDS OF GOODS	AMOUNT OF CONTRACT	CONTACT PERSON, CONTACT NO., ADDRESS, AND EMAIL ADDRESS

FORM-08

Formula in the Computation of NFCC

_____

NAME OF PROJECT

_____

NAME OF COMPANY

NFCC = 15 (Current Assets – Current Liabilities) – Value of All Outstanding Works under On-going Contracts including Awarded Contracts yet to be started)

YEAR	CURRENT ASSETS	CURRENT LIABILITIES
TOTAL		

Value of Outstanding Works under On-going Contracts:

CONTRACT DESCRIPTION	TOTAL CONTRACT AMOUNT AT AWARD	PERCENTAGE OF PLANNED AND ACTUAL ACCOMPLISHMENT	ESTIMATED COMPLETION TIME
TOTAL			

Use additional sheet/s, if necessary

FORMULA:

15 (_____ – _____) – _____ = _____

Current Assets minus Current Liabilities minus Total Outstanding Works **NFCC**

P_____
NFCC

Prepared and Submitted by:

_____

Signature over Printed Name

FORM-09

(Name of Bank)

COMMITTED LINE OF CREDIT CERTIFICATE

Date: _____

Social Security System (SSS)
SSS Main Building, East Avenue
Diliman, Quezon City

CONTRACT PROJECT	:	_____
COMPANY/FIRM	:	_____
ADDRESS	:	_____
BANK/FINANCING INSTITUTION	:	_____
ADDRESS	:	_____
AMOUNT	:	_____

This is to certify that the above Bank/Financing Institution with business address indicated above, commits to provide the (Supplier/Distributor/Manufacturer/Contractor), if awarded the above-mentioned Contract, a credit line in the amount specified above which shall be exclusively used to finance the performance of the above-mentioned contract subject to our terms, conditions and requirements.

The credit line shall be available within fifteen (15) calendar days after receipt by the (Supplier/Distributor/Manufacturer/Contractor) of the Notice of Award and such line of credit shall be maintained until issuance of Certificate of Acceptance by the Social Security System.

This Certification is being issued in favor of said (Supplier/Distributor/Manufacturer/Contractor) in connection with the bidding requirement of (Name of Procuring Entity) for the above-mentioned Contract. We are aware that any false statements issued by us make us liable for perjury.

The committed line of credit cannot be terminated or cancelled without the prior written approval of Social Security System.

Name and Signature of Authorized Financing Institution Office

Office Designation

Concurred by:

Name & Signature of (Supplier/Distributor/Manufacturer/Contractor) Authorized Representative

Official Designation

SUBSCRIBED AND SWORN TO BEFORE ME this _____ day of _____ at _____ Philippines, Affiant exhibited to me his/her competent Evidence of Identity (as defines by the 2004 Rules on Notarial Practice _____issued on _____ at _____, Philippines.

NOTARY PUBLIC

Doc No. : _____
Page No. : _____
Book No. : _____
Series of : _____

(Note: The amount committed should be machine validated in the Certificate itself)


Republic of the Philippines
gppb
Government Procurement Policy Board