



FIELD OFFICE XII  
PUROK BUMANAAG, BRGY. ZONE III, KORONADAL CITY, 9506

# **PHILIPPINE BIDDING DOCUMENTS**

(As Harmonized with Development Partners)

## **Procurement of INFRASTRUCTURE PROJECTS FOR THE COMPLETION OF DSWD FIELD OFFICE XII BUILDING AT BRGY. CARPENTER HILL, KORONADAL CITY**

Government of the Republic of the Philippines

**Sixth Edition  
July 2020**

# Preface

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

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

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

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

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

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

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

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# *Glossary of Terms, Abbreviations, and Acronyms*

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

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

**BAC** – Bids and Awards Committee.

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

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

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

**BIR** – Bureau of Internal Revenue.

**BSP** – Bangko Sentral ng Pilipinas.

**CDA** – Cooperative Development Authority.

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

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

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

**CPI** – Consumer Price Index.

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

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

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

**GFI** – Government Financial Institution.

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

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

**GOP** – Government of the Philippines.

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

**LGUs** – Local Government Units.

**NFCC** – Net Financial Contracting Capacity.

**NGA** – National Government Agency.

**PCAB** – Philippine Contractors Accreditation Board.

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

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

**PSA** – Philippine Statistics Authority.

**SEC** – Securities and Exchange Commission.

**SLCC** – Single Largest Completed Contract.

**UN** – United Nations.



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

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

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

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

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

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

## **Invitation to Bid for Procurement of Infrastructure Projects for the Completion of DSWD Field Office XII Building at Brgy. Carpenter Hill, Koronadal City**

1. The **Department of Social Welfare and Development Field Office XII**, through the **Government of the Philippines (GOP)** under **General Appropriations Act (GAA) 2021** intends to apply the sum of **Nineteen Million Nine Hundred Ninety-One Thousand Nine Hundred Sixty Pesos and Eighty-Nine Centavos (Php19,991,960.89)** being the Approved Budget for the Contract (ABC) to payments under the contract for **Procurement of Infrastructure Projects for the Completion of DSWD Field Office XII Building at Brgy. Carpenter Hill, Koronadal City with Project Identification Number 21-010**. Bids received in excess of the ABC shall be automatically rejected at bid opening.
2. The **Department of Social Welfare and Development Field Office XII** now invites bids for the above Procurement Project. Completion of the Works is required ***One Hundred Eighty (180) Calendar Days Contract Duration***. Bidders should have completed a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II (Instructions to Bidders).
3. Bidding will be conducted through open competitive bidding procedures using non-discretionary “*pass/fail*” criterion as specified in the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.
4. Interested bidders may obtain further information from *DSWD Bids and Awards Committee Secretariat* and inspect the Bidding Documents at the address given below from *8:00 a.m. to 5:00 p.m.*
5. A complete set of Bidding Documents may be acquired by interested bidders on **May 18, 2021** from given address and website/s below *and upon payment of the applicable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of Twenty-five Thousand pesos Only (Php 25,000.00)*. The Procuring Entity shall allow the bidder to present its proof of payment for the fees *in person, by facsimile, or through electronic means*.
6. The **Department of Social Welfare and Development Field Office XII** will hold a Pre-Bid Conference<sup>1</sup> on **May 24, 2021, 1:30 p.m. at DSWD FO XII Office**, which shall be open to prospective bidders.

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

7. Bids must be duly received by the BAC Secretariat through **June 7, 2021, 10:00 a.m. at DSWD FO XII Procurement Section Office** through manual submission. Late bids shall not be accepted.
8. All bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in **ITB** Clause 16.
9. Bid opening shall be on **June 7, 2021, 1:30 p.m. at DSWD FO XII**. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.
10. The **Department of Social Welfare and Development Field Office XII** reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35.6 and 41 of the 2016 revised Implementing Rules and Regulations (IRR) of RA No. 9184, without thereby incurring any liability to the affected bidder or bidders.
11. For further information, please refer to:

*DSWD FO XII-BAC Secretariat  
Administrative Division-Procurement Section  
Department of Social Welfare and Development FO XII  
Purok Bumanaag, Brgy. Zone III, Koronadal City  
Email Address: [procurement.fo12@dswd.gov.ph](mailto:procurement.fo12@dswd.gov.ph)  
Telephone No. +63 (083)-228-8637*

12. You may visit the following websites:

For downloading of Bidding Documents: <https://fo12.dswd.gov.ph/bid-bulletin/>

*May 17, 2021*

*(signed) JACKIYA A. LAO  
BAC Chairperson DSWD FO XII*

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

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

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

## 1. Scope of Bid

The Procuring Entity, **Department of Social Welfare and Development Field Office XII** invites Bids for the **Procurement of Infrastructure Projects for the Completion of DSWD Field Office XII Building at Brgy. Carpenter Hill, Koronadal City** with **Project Identification Number 21-010**

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 *FY 2021* in the amount of **Nineteen Million Nine Hundred Ninety-One Thousand Nine Hundred Sixty Pesos and Eighty-Nine Centavos (Php19, 991,960.89)**

2.2. The source of funding is:

- a. NGA, the General Appropriations Act or Special Appropriations.

## 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 “P” of the 2016 revised IRR of RA No. 9184 or other integrity violations in competing for the Project.

## 5. Eligible Bidders

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

## 6. Origin of Associated Goods

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

## 7. Subcontracts

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

The Procuring Entity has prescribed that:

### a. Subcontracting is not allowed.

- 7.1. Subcontracting of any portion of the Project does not relieve the Contractor of any liability or obligation under the Contract. The Supplier will be responsible for the acts, defaults, and negligence of any subcontractor, its agents, servants, or workmen as fully as if these were the Contractor's own acts, defaults, or negligence, or those of its agents, servants, or workmen.

## 8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on **May 24, 2021, 1:30 p.m. at DSWD FO XII Office** 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:*

- a. 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 **October 8, 2021**. 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 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 16 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***

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

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

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

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

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

# Bid Data Sheet

ITB Clause																															
5.2	For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be:  <b>Buildings: Construction – Low Rise – Concrete (Frame)</b>																														
7.1	<i>Subcontracting is not allowed</i>																														
10.3	<i>No further instructions</i>																														
10.4	The key personnel must meet the required minimum years of experience set below:  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Key Personnel</u></th> <th style="text-align: center;"><u>General Experience</u></th> <th style="text-align: center;"><u>Relevant Experience</u></th> </tr> </thead> <tbody> <tr> <td>Project Manager</td> <td style="text-align: center;">5 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Project Engineer</td> <td style="text-align: center;">5 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Materials Engineer</td> <td style="text-align: center;">5 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Electrical Engineer</td> <td style="text-align: center;">5 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Architect</td> <td style="text-align: center;">5 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Safety Officer</td> <td style="text-align: center;">5 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Skilled Electrician</td> <td style="text-align: center;">5 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Skilled Mason</td> <td style="text-align: center;">5 years</td> <td style="text-align: center;">3 years</td> </tr> <tr> <td>Foreman</td> <td style="text-align: center;">5 years</td> <td style="text-align: center;">3 years</td> </tr> </tbody> </table>	<u>Key Personnel</u>	<u>General Experience</u>	<u>Relevant Experience</u>	Project Manager	5 years	3 years	Project Engineer	5 years	3 years	Materials Engineer	5 years	3 years	Electrical Engineer	5 years	3 years	Architect	5 years	3 years	Safety Officer	5 years	3 years	Skilled Electrician	5 years	3 years	Skilled Mason	5 years	3 years	Foreman	5 years	3 years
<u>Key Personnel</u>	<u>General Experience</u>	<u>Relevant Experience</u>																													
Project Manager	5 years	3 years																													
Project Engineer	5 years	3 years																													
Materials Engineer	5 years	3 years																													
Electrical Engineer	5 years	3 years																													
Architect	5 years	3 years																													
Safety Officer	5 years	3 years																													
Skilled Electrician	5 years	3 years																													
Skilled Mason	5 years	3 years																													
Foreman	5 years	3 years																													
10.5	The minimum major equipment requirements are the following:  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Equipment</u></th> <th style="text-align: center;"><u>Capacity</u></th> <th style="text-align: center;"><u>Number of Units</u></th> </tr> </thead> <tbody> <tr> <td>Concrete Mixer</td> <td style="text-align: center;">1 bagger</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Concrete Vibrator</td> <td style="text-align: center;">5-6hp</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Bar Cutter</td> <td style="text-align: center;">Single Phase 25mm</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Bar Bender</td> <td style="text-align: center;">3 Phase 25mm</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Welding Machine</td> <td></td> <td style="text-align: center;">2</td> </tr> <tr> <td>Cutting Outfit</td> <td></td> <td style="text-align: center;">2</td> </tr> <tr> <td>Generator Set</td> <td></td> <td style="text-align: center;">1</td> </tr> <tr> <td>Electric Drill</td> <td></td> <td style="text-align: center;">1</td> </tr> <tr> <td>Plate Compactor</td> <td></td> <td style="text-align: center;">1</td> </tr> </tbody> </table>	<u>Equipment</u>	<u>Capacity</u>	<u>Number of Units</u>	Concrete Mixer	1 bagger	2	Concrete Vibrator	5-6hp	2	Bar Cutter	Single Phase 25mm	1	Bar Bender	3 Phase 25mm	1	Welding Machine		2	Cutting Outfit		2	Generator Set		1	Electric Drill		1	Plate Compactor		1
<u>Equipment</u>	<u>Capacity</u>	<u>Number of Units</u>																													
Concrete Mixer	1 bagger	2																													
Concrete Vibrator	5-6hp	2																													
Bar Cutter	Single Phase 25mm	1																													
Bar Bender	3 Phase 25mm	1																													
Welding Machine		2																													
Cutting Outfit		2																													
Generator Set		1																													
Electric Drill		1																													
Plate Compactor		1																													
12	<i>Value Engineering clause will be discussed During Pre-Bid Conference</i>																														
15.1	The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts: <p style="margin-left: 40px;">a. The amount of not less than <b>Php 399,839.22</b> [(2%) of ABC], if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit;</p> <p style="margin-left: 40px;">b. The amount of not less than <b>Php 999,598.04</b> [(5%) of ABC] if bid security is in Surety Bond.</p>																														

19.2	<p>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.</p> <p>In all cases, the NFCC computation must be sufficient for the contract to be awarded to the Bidder.</p>
20	<i>No further Instructions</i>
21	<p>Additional contract documents relevant to the Project:</p> <p>Construction schedule and S-curve, manpower schedule, construction methods, equipment utilization schedule, construction safety and health program approved by the DOLE, PERT/CPM and other acceptable tools of project scheduling.</p>

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

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

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

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

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

## 1. Definitions

For purposes of this Clause, boldface type is used to identify defined terms.

- 1.1. The **Arbiter** is the person appointed jointly by the Procuring Entity and the Contractor to resolve disputes in the first instance, as provided for in GCC Clause 21.
- 1.2. **Bill of Quantities** refers to a list of the specific items of the Work and their corresponding unit prices, lump sums, and/or provisional sums.
- 1.3. The **Completion Date** is the date of completion of the Works as certified by the Procuring Entity's Representative, in accordance with GCC Clause 49.
- 1.4. The **Contract** is the contract between the Procuring Entity and the Contractor to execute, complete, and maintain the Works.
- 1.5. The **Contract Effectivity Date** is the date of signing of the Contract. However, the contractor shall commence execution of the Works on the Start Date as defined in GCC Clause 1.28.
- 1.6. The **Contract Price** is the price stated in the Notice of Award and thereafter to be paid by the Procuring Entity to the Contractor for the execution of the Works in accordance with this Contract.
- 1.7. **Contract Time Extension** is the allowable period for the Contractor to complete the Works in addition to the original Completion Date stated in this Contract.
- 1.8. The **Contractor** is the juridical entity whose proposal has been accepted by the Procuring Entity and to whom the Contract to execute the Work was awarded.
- 1.9. The **Contractor's Bid** is the signed offer or proposal submitted by the Contractor to the Procuring Entity in response to the Bidding Documents.
- 1.10. **Days** are calendar days; months are calendar months.
- 1.11. **Dayworks** are varied work inputs subject to payment on a time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant.
- 1.12. A **Defect** is any part of the Works not completed in accordance with the Contract.
- 1.13. The **Defects Liability Certificate** is the certificate issued by Procuring Entity's Representative upon correction of defects by the Contractor.
- 1.14. The **Defects Liability Period** is the one year period between contract completion and final acceptance within which the Contractor assumes the

responsibility to undertake the repair of any damage to the Works at his own expense.

- 1.15. **Drawings** are graphical presentations of the Works. They include all supplementary details, shop drawings, calculations, and other information provided or approved for the execution of this Contract.
- 1.16. **Equipment** refers to all facilities, supplies, appliances, materials or things required for the execution and completion of the Work provided by the Contractor and which shall not form or are not intended to form part of the Permanent Works.
- 1.17. The **Intended Completion Date** refers to the date specified in the SCC when the Contractor is expected to have completed the Works. The Intended Completion Date may be revised only by the Procuring Entity's Representative by issuing an extension of time or an acceleration order.
- 1.18. **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.
- 1.19. The **Notice to Proceed** is a written notice issued by the Procuring Entity or the Procuring Entity's Representative to the Contractor requiring the latter to begin the commencement of the work not later than a specified or determinable date.
- 1.20. **Permanent Works** are all permanent structures and all other project features and facilities required to be constructed and completed in accordance with this Contract which shall be delivered to the Procuring Entity and which shall remain at the Site after the removal of all Temporary Works.
- 1.21. **Plant** refers to the machinery, apparatus, and the like intended to form an integral part of the Permanent Works.
- 1.22. The **Procuring Entity** is the party who employs the Contractor to carry out the Works stated in the SCC.
- 1.23. The **Procuring Entity's Representative** refers to the Head of the Procuring Entity or his duly authorized representative, identified in the SCC, who shall be responsible for supervising the execution of the Works and administering this Contract.
- 1.24. The **Site** is the place provided by the Procuring Entity where the Works shall be executed and any other place or places which may be designated in the SCC, or notified to the Contractor by the Procuring Entity's Representative as forming part of the Site.
- 1.25. **Site Investigation Reports** are those that were included in the Bidding Documents and are factual and interpretative reports about the surface and subsurface conditions at the Site.



- 1.26. **Slippage** is a delay in work execution occurring when actual accomplishment falls below the target as measured by the difference between the scheduled and actual accomplishment of the Work by the Contractor as established from the work schedule. This is actually described as a percentage of the whole Works.
- 1.27. **Specifications** means the description of Works to be done and the qualities of materials to be used, the equipment to be installed and the mode of construction.
- 1.28. The **Start Date**, as specified in the SCC, is the date when the Contractor is obliged to commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.
- 1.29. A **Subcontractor** is any person or organization to whom a part of the Works has been subcontracted by the Contractor, as allowed by the Procuring Entity, but not any assignee of such person.
- 1.30. **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Permanent Works.
- 1.31. **Work(s)** refer to the Permanent Works and Temporary Works to be executed by the Contractor in accordance with this Contract, including (i) the furnishing of all labor, materials, equipment and others incidental, necessary or convenient to the complete execution of the Works; (ii) the passing of any tests before acceptance by the Procuring Entity's Representative; (iii) and the carrying out of all duties and obligations of the Contractor imposed by this Contract as described in the SCC

## 2. **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.

## 3. **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).

#### **4. Possession of Site**

- 4.1. 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.
- 4.2. 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.

#### **5. 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.

#### **6. 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.

#### **7. 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.

#### **8. 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**.

## **9. 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.

## **10. 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.

## **11. 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.

## **12. 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.

### **13. 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.

### **14. 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.

### **15. 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.

### **16. Operating and Maintenance Manuals**

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

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

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

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

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

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

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

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

# Special Conditions of Contract

GCC Clause	
2	<i>The <b>Intended Completion Date</b> is <b>One Hundred Eighty (180) calendar days</b> upon receipt of the Notice to Proceed.</i>
4.1	<i>The Procuring Entity shall give possession of all parts of the Site to the Contractor upon receipt of the Notice to Proceed.</i>
6	The site investigation reports shall include plans and drawings.
7.2	<p><i>[Select one, delete the other.]</i></p> <p><i>[In case of permanent structures, such as buildings of types 4 and 5 as classified under the National Building Code of the Philippines and other structures made of steel, iron, or concrete which comply with relevant structural codes (e.g., DPWH Standard Specifications), such as, but not limited to, steel/concrete bridges, flyovers, aircraft movement areas, ports, dams, tunnels, filtration and treatment plants, sewerage systems, power plants, transmission and communication towers, railway system, and other similar permanent structures:]</i> Fifteen (15) years.</p> <p><i>[In case of semi-permanent structures, such as buildings of types 1, 2, and 3 as classified under the National Building Code of the Philippines, concrete/asphalt roads, concrete river control, drainage, irrigation lined canals, river landing, deep wells, rock causeway, pedestrian overpass, and other similar semi-permanent structures:]</i> Five (5) years.</p> <p><i>[In case of other structures, such as bailey and wooden bridges, shallow wells, spring developments, and other similar structures:]</i> Two (2) years.</p>
10	No dayworks are applicable to the contract.
11.1	The Contractor shall submit the Program of Work to the Procuring Entity’s Representative within <b>Fifteen (15) calendar days</b> from the Notice of Award.
11.2	The amount to be withheld for late submission of an updated Program of Work is <b>Ten percent (10%) of the remaining value of works.</b>
13	The amount of the advance payment shall not exceed <b>Fifteen Percent (15%) of the total contract price to be recouped every progress billing.</b>
14	Materials and equipment delivered on the site but not completely put in place shall not be included for payment.
15.1	<p>The date by which operating and maintenance manuals are required is <b>Not Applicable.</b></p> <p>The date by which “as built” drawings are required is <b>Thirty (30) calendar days from Completion</b></p>
15.2	The amount to be withheld for failing to produce “as built” drawings and/or operating and maintenance manuals by the date required is <b>One Percent (1%) of the final contract amount.</b>

# *Section VI. Specifications*

## TECHNICAL SPECIFICATIONS

### **A. GENERAL INFORMATION**

**Project: Procurement of Infrastructure Projects for the Completion of DSWD Field Office XII Building at Brgy. Carpenter Hill, Koronadal City**

- 1.) Location: Brgy. Carpenter Hill, Koronadal City
- 2.) Lot Area: 1,081.52 m<sup>2</sup>
- 3.) Area of Building: 1,490.96 m<sup>2</sup> square meters (Three-storey)

### **B. SCOPE OF WORKS (see attached ANNEX A Technical Specifications)**

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

LIST
<i>Architectural Plans</i>
<i>Structural Plans</i>
<i>Electrical Plans</i>
<i>Sanitary Plans</i>
<i>Mechanical Plans</i>
<i>Electronics Plans</i>

The actual Drawings, including site plans, are available at the DSWD FO XII, Procurement Section, upon procurement of the corresponding bidding documents.



## *Section VIII. Bill of Quantities*

<b>Project and Locations: Procurement of Infrastructure Projects for the Completion of DSWD Field Office XII Building at Brgy. Carpenter Hill, Koronadal City</b>					
<b>Item No.</b>	<b>Scope of Works</b>	<b>Unit</b>	<b>Quantity</b>	<b>Unit Cost (in Peso)</b>	<b>Total Amount (in Peso)</b>
	<b>SITWORKS</b>				
<b>I</b>	Item Description:800(1) Clearing				
	Unit: <b>Square Meter</b>				
	Output per hour: <b>50 Sq.m.</b>				
	Quantity: <b>498.36</b>				
	Computed Duration: <b>1.25 Days</b>				
	<b>Labor</b>				
	a. Project Supervision (Foreman)	1	9.97		
	b.Skilled Worker	4	9.97		
	c.Unskilled	10	9.97		
	<b>SITWORKS</b>				
<b>II</b>	Item Description: 804 (4) <b>Gravel Fill</b>				
	Unit: <b>Cu.m.</b>				
	Output Per Hour:2.0 m3				
	Quantity: <b>49.84</b>				
	Computed Duration: <b>3.12 Days</b>				
	<b>Labor</b>				
	a. Project Supervision (Foreman)	1	24.92		
	b.Skilled Worker	4	24.92		
	c.Unskilled	8	24.92		
	<b>Materials</b>				
	a. Material				
	G1 Gravel	m <sup>3</sup>	50		

<b>III</b>	Item Description: <b>900 (1) c 1 Structural Concrete (Class A)</b>				
	Unit: <b>Cu.m.</b>				
	Output Per Hour: <b>0.90 m<sup>3</sup></b>				
	Quantity: <b>49.84</b>				
	Computed Duration: 23.71 Days				
	Labor				
	a. Project Supervision (Foreman)	1	189.69		
	b.Skilled Mason	12	189.69		
	c.Unskilled	12	189.69		
	Name of Capacity	No. of Unit/s	No. of Hour/s		
	Equipment				
	1 bagger mixer	1	189.69		
	1 concrete vibrator	1	189.69		
	Name and Specifications	Unit	Quantity		
	Materials				
	Portland Cement	bags	2,049.00		
	Washed Sand	cu.m	111		
	3/4 Crushed Cravel	cu.m	171		
<b>IV</b>	Item Description : 902 (1)a Reinforcing Steel (Deformed)				
	Unit: kgs				
	Output per hour: 114.00 kgs				
	Quantity: 25,261.19				
	Computed Duration: 28.13 Days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	221.59		

	b.Skilled Steel man	12	221.59		
	c.Unskilled	12	221.59		
	Name of Capacity	No. of Unit/s	No. of Hour/s		
	Equipment				
	Bar Cutter, Single Phase, 25mm	1	221.59		
	Bar Bender, 3 Phase , 25mm	1	221.59		
	Labor and Equipment				
	Materials				
	20mm dia. X 6m Def. bar: 740.74	length	605		
	16mm dia. X 6m Def. bar: 474.07	length	151		
	12mm dia. X 6m Def. bar: 266.67	length	1,984.00		
	10mm dia. X 6m Def. bar: 185.19	length	1,157.00		
	# 16 GI Tie wire	kgs	407		
<b>V</b>	Item Description : 903 (2) Formworks and Faseworks				
	Unit: sq.m.				
	Output per hour: 7.00 m <sup>2</sup>				
	Quantity: 909.42				
	Computed Duration: 16.24 Days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	129.92		
	b.Skilled Carpenter	10	129.92		
	c.Unskilled	10	129.92		
	Name and Specifications	Unit	Quantity		

	Materials				
	2x3x12 Coco Lumber: 1374 pcs	bdf	8,240.47		
	2x2x12 Coco Lumber: 916 pcs	bdf	3,662.94		
	1/2x4x8 Marine Plywood	pcs	200		
	# 4 CWN	kgs	120		
	# 3 CWN	kgs	100		
	# 2 CWN	kgs	50		
	# 1 1/2 CWN	kgs	50		
	ROOFING				
<b>VI</b>	Item Description : 1047 (8) Structural Steel (Roof Framing)				
	Unit: Lump Sum				
	Output per hour:				
	Quantity: 1.00				
	Computed Duration: 7 Days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	c	56		
	b.Skilled Carpenter	3	56		
	c.Unskilled	3	56		
	Name of Capacity	No. of Unit/s	No. of Hour/s		
	Equipment				
	Welding Machine	1	56		
	Cutting Outfit	1	56		
	Name and Specifications	Unit	Quantity		
	Materials				
	1/4 x 2 x 2 angle bar	length	23		
	PURLINS (1.2mm x 2 x 4 CEE Purlins)	length	17		
	16mm dia. Turn Buckle	length	12		
	E6012 Welding Electrode	kgs	30		
	Red Oxide Primer	gals	10		

	Laquer Thinner	gals	10		
	Paint Brush	pcs	10		
	12mm dia, x 6m plain bar - Sag rod	pcs	10		
	ROOFING				
<b>VII</b>	Item Description : 1003 (12) Facia Board				
	Unit: Sq.m.				
	Output per hour: 1.00 sq.m.				
	Quantity: 11.46				
	Computed Duration: 1.43 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	11.46		
	b.Skilled Carpenter	2	11.46		
	c.Unskilled	3	11.46		
	Name and Specifications	Unit	Quantity		
	Materials				
	1.2mm x 50mm x 100mm CEE Purlins- FACIA	pcs	14		
	ROOFING				
<b>VIII</b>	Item Description : 1014 (1)b2 Prepainted Metal Sheets				
	Unit: Ln.m				
	Output per hour: 2.76 Ln.m.				
	Quantity: 75				
	Computed Duration: 3.40 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	27.17		
	b.Skilled Carpenter	3	27.17		
	c.Unskilled	3	27.17		

	<b>Name and Specifications</b>	<b>Unit</b>	<b>Quantity</b>		
	Materials				
	0.427 mm x 1030 Pre-Painted Hi-Rib long span	Ln.m	75		
	No. 12 (5.5m x 58mm Sealing Self Drilling Hexagon Tekscew	pcs	1,875.00		
	<b>ROOFING</b>				
<b>IX</b>	Item Description : 1013 (2)b4 Fabricated Metal Roofing Accessory				
	Unit: Ln.m				
	Output per hour: 3.0 Ln.m.				
	Quantity: 37				
	Computed Duration: 1.54 days				
	<b>Designation</b>	<b>No. of Person/s</b>	<b>No. of Hour/s</b>		
	Labor				
	a. Project Supervision (Foreman)	1	12.33		
	b.Skilled Carpenter	2	12.33		
	c.Unskilled	2	12.33		
	<b>Name and Specifications</b>	<b>Unit</b>	<b>Quantity</b>		
	Materials				
	gauge 24 Fabricated Blind Gutter	ln.m	37		
	5/32 x 1 Blind Rivets	box	3		
<b>X</b>	Item Description : 1016 (1) b Waterproofing				
	Unit: Sq.m.				
	Output per hour: 4.0 Sq.m.				
	Quantity: 461.53				
	Computed Duration: 14.42 days				

	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	115.38		
	b.Skilled Carpenter	5	115.38		
	c.Unskilled	6	115.38		
	Name and Specifications	Unit	Quantity		
	Materials				
	Polymerized Resin Based Waterproofing	sq.m.	461.53		
<b>XI</b>	Item Description : 1046 (2)a1 CHB Non Load Bearing				
	Unit: Sq.m.				
	Output per hour: 6.50 Sq.m.				
	Quantity: 498.56				
	Computed Duration: 9.59 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	76.7		
	b.Skilled Carpenter	6	76.7		
	c.Unskilled	8	76.7		
	Name and Specifications	Unit	Quantity		
	Materials				
	Cement	bags	260		
	4" CHB	pcs	6,481.00		
	Washed Sand	cu.m	22		
	10mm dia. X 6m def.bar	pcs	356		
	#16 GI Tie wire	kgs	16		
<b>XII</b>	Item Description : 1027 Cement Plaster Finish				
	Unit: Sq.m.				

	Output per hour: 13.50 Sq.m.				
	Quantity: 997.12				
	Computed Duration: 9.23 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	73.86		
	b.Skilled Mason	3	73.86		
	c.Unskilled	3	73.86		
	Name and Specifications	Unit	Quantity		
	Materials				
	Cement	bags	192		
	Screened Sand	cu.m	16		
<b>XIII</b>	Item Description : 1003 (1) a1 Ceiling Works				
	Unit: Sq.m.				
	Output per hour: 3.00 Sq.m.				
	Quantity: 496.99 Sq.m.				
	Computed Duration: 20.71 days				
	Labor				
	a. Project Supervision (Foreman)	1	165.66		
	b.Skilled Mason	2	165.66		
	c.Unskilled	2	165.66		
	Name and Specifications	Unit	Quantity		
	Materials				
	0.8mm 12mm x 38mm Carrying Chanel	Length	165		
	0.04mm x 19mm x 50mm Metal Furring Double	Length	493		
	0.40 mm thich x 50mm Duoble Wall Clip	pcs	200		
	4.5mm x 1.2m x 2.4m Fiber Cement Board	pcs	199		



	5/32 Blind Rivets	pcs	2,500.00		
	1 1/2 Concrete Nails	kgs	6		
	WINDOWS				
<b>XIV</b>	Item Description : 1008 (1) C Reflected Blue Glass Windows				
	Unit: Sq.m.				
	Output per hour: Lump Sum				
	Quantity: 22.44				
	Computed Duration: 7.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	56		
	b.Skilled Mason	6	56		
	c.Unskilled	6	56		
	Name and Specifications	Unit	Quantity		
	Materials				
	W - 1, (3m X 1.40m) 1/4 thk Sliding Glass Window on Analok Frame	sets	5		
	W - 3, (0.60m X 0.6m) 1/4 thk Glass High Window on Analok Frame	sets	4		
	DOORS				
<b>XV</b>	Item Description : 1007(1) b Reflected Blue Glass Windows				
	Unit: Sets				
	Output per hour: 0.13 Lump Sum				
	Quantity: 4.00				
	Computed Duration: 4.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				

	a. Project Supervision (Foreman)	1	32		
	b.Skilled Mason	9	32		
	c.Unskilled	6	32		
	Name and Specifications	Unit	Quantity		
	Materials				
	Double Swing Door with Two Side Fixed 6mm on Analok Frame -Clear Glass	set	4		
	DOORS				
<b>XVI</b>	Item Description : 1010 (2) b Doors Wood Panel				
	Unit: Sq.m.				
	Output per hour: 0.13 Sq.m.				
	Quantity: 3.00				
	Computed Duration: 3.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	24		
	b.Skilled Mason	4	24		
	c.Unskilled	4	24		
	Name and Specifications	Unit	Quantity		
	Materials				
	1 x 2.1 m Decorative Wooden Panel Door on 2 x 8 Door Jambs with Complete Accessories	sets	3		
	Quantity: 1.00				
	Computed Duration: 7 Days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	c	56		

	b.Skilled Carpenter	3	56		
	c.Unskilled	3	56		
	Name of Capacity	No. of Unit/s	No. of Hour/s		
	Equipment				
	Welding Machine	1	56		
	Cutting Outfit	1	56		
	Name and Specifications	Unit	Quantity		
	Materials				
	1/4 x 2 x 2 angle bar	length	23		
	PURLINS (1.2mm x 2 x 4 CEE Purlins)	length	17		
	16mm dia. Turn Buckle	length	12		
	E6012 Welding Electrode	kgs	30		
	Red Oxide Primer	gals	10		
	Lacquer Thinner	gals	10		
	Paint Brush	pcs	10		
	12mm dia, x 6m plain bar - Sag rod	pcs	10		
	ROOFING				
<b>VII</b>	Item Description : 1003 (12) Facia Board				
	Unit: Sq.m.				
	Output per hour: 1.00 sq.m.				
	Quantity: 11.46				
	Computed Duration: 1.43 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	11.46		
	b.Skilled Carpenter	2	11.46		
	c.Unskilled	3	11.46		
	Name and Specifications	Unit	Quantity		
	Materials				

	1.2mm x 50mm x 100mm CEE Purlins- FACIA	pcs	14		
	ROOFING				
<b>VIII</b>	Item Description : 1014 (1)b2 Prepainted Metal Sheets				
	Unit: Ln.m				
	Output per hour: 2.76 Ln.m.				
	Quantity: 75				
	Computed Duration: 3.40 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	27.17		
	b.Skilled Carpenter	3	27.17		
	c.Unskilled	3	27.17		
	Name and Specifications	Unit	Quantity		
	Materials				
	0.427 mm x 1030 Pre-Painted Hi-Rib long span	Ln.m	75		
	No. 12 (5.5m x 58mm Sealing Self Drilling Hexagon Tekscew	pcs	1,875.00		
	ROOFING				
<b>IX</b>	Item Description : 1013 (2)b4 Fabricated Metal Roofing Accessory				
	Unit: Ln.m				
	Output per hour: 3.0 Ln.m.				
	Quantity: 37				
	Computed Duration: 1.54 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	12.33		

	b.Skilled Carpenter	2	12.33		
	c.Unskilled	2	12.33		
	Name and Specifications	Unit	Quantity		
	Materials				
	gauge 24 Fabricated Blind Gutter	ln.m	37		
	5/32 x 1 Blind Rivets	box	3		
<b>X</b>	Item Description : 1016 (1) b Waterproofing				
	Unit: Sq.m.				
	Output per hour: 4.0 Sq.m.				
	Quantity: 461.53				
	Computed Duration: 14.42 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	115.38		
	b.Skilled Carpenter	5	115.38		
	c.Unskilled	6	115.38		
	Name and Specifications	Unit	Quantity		
	Materials				
	Polymerized Resin Based Waterproofing	sq.m.	461.53		
<b>XI</b>	Item Description : 1046 (2)a1 CHB Non Load Bearing				
	Unit: Sq.m.				
	Output per hour: 6.50 Sq.m.				
	Quantity: 498.56				
	Computed Duration: 9.59 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				

	a. Project Supervision (Foreman)	1	76.7		
	b.Skilled Carpenter	6	76.7		
	c.Unskilled	8	76.7		
	Name and Specifications	Unit	Quantity		
	Materials				
	Cement	bags	260		
	4" CHB	pcs	6,481.00		
	Washed Sand	cu.m	22		
	10mm dia. X 6m def.bar	pcs	356		
	#16 GI Tie wire	kgs	16		
<b>XII</b>	Item Description : 1027 Cement Plaster Finish				
	Unit: Sq.m.				
	Output per hour: 13.50 Sq.m.				
	Quantity: 997.12				
	Computed Duration: 9.23 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	73.86		
	b.Skilled Mason	3	73.86		
	c.Unskilled	3	73.86		
	Name and Specifications	Unit	Quantity		
	Materials				
	Cement	bags	192		
	Screened Sand	cu.m	16		
<b>XIII</b>	Item Description : 1003 (1) a1 Ceiling Works				
	Unit: Sq.m.				
	Output per hour: 3.00 Sq.m.				
	Quantity: 496.99 Sq.m.				
	Computed Duration: 20.71 days				

	Labor				
	a. Project Supervision (Foreman)	1	165.66		
	b.Skilled Mason	2	165.66		
	c.Unskilled	2	165.66		
	Name and Specifications	Unit	Quantity		
	Materials				
	0.8mm 12mm x 38mm Carrying Chanel	Length	165		
	0.04mm x 19mm x 50mm Metal Furring Double	Length	493		
	0.40 mm thich x 50mm Duoble Wall Clip	pcs	200		
	4.5mm x 1.2m x 2.4m Fiber Cement Board	pcs	199		
	5/32 Blind Rivets	pcs	2,500.00		
	1 1/2 Concrete Nails	kgs	6		
	WINDOWS				
<b>XIV</b>	Item Description : 1008 (1) C Reflected Blue Glass Windows				
	Unit: Sq.m.				
	Output per hour: Lump Sum				
	Quantity: 22.44				
	Computed Duration: 7.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	56		
	b.Skilled Mason	6	56		
	c.Unskilled	6	56		
	Name and Specifications	Unit	Quantity		
	Materials				
	W - 1, (3m X 1.40m) 1/4 thk Sliding Glass Window on Analok Frame	sets	5		

	W - 3, (0.60m X 0.6m) 1/4 thk Glass High Window on Analok Frame	sets	4		
	DOORS				
<b>XV</b>	Item Description : 1007(1) b Reflected Blue Glass Windows				
	Unit: Sets				
	Output per hour: 0.13 Lump Sum				
	Quantity: 4.00				
	Computed Duration: 4.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	32		
	b.Skilled Mason	9	32		
	c.Unskilled	6	32		
	Name and Specifications	Unit	Quantity		
	Materials				
	Double Swing Door with Two Side Fixed 6mm on Analok Frame -Clear Glass	set	4		
	Total Direct Cost				
	Overhead, Contingencies, and Miscellaneous				
	Contractors Profit				
	Value Added Tax				
	Total cost for XV				
	DOORS				
<b>XVI</b>	Item Description : 1010 (2) b Doors Wood Panel				
	Unit: Sq.m.				
	Output per hour: 0.13 Sq.m.				
	Quantity: 3.00				



	Computed Duration: 3.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	24		
	b.Skilled Mason	4	24		
	c.Unskilled	4	24		
	Name and Specifications	Unit	Quantity		
	Materials				
	1 x 2.1 m Decorative Wooden Panel Door on 2 x 8 Door Jambs with Complete Accessories	sets	3		
	DOORS				
<b>XVII</b>	Item Description : 1043 (1) PVC Doors and Frames				
	Unit: Sets				
	Output per hour: 0.13 Sq.m.				
	Quantity: 4.00				
	Computed Duration: 4.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	32		
	b.Skilled Mason	2	32		
	c.Unskilled	2	32		
	Name and Specifications	Unit	Quantity		
	Materials				
	0.7 m X 2.1m PVC Doors and Frame with Complete Accessories.	set	4		
	Total Direct Cost				

	Overhead, Contingencies, and Miscellaneous				
	Contractors Profit				
	Value Added Tax				
	Total cost for XVII				
<b>XVIII</b>	Item Description : Cladding Works (Aluminum Cladding)				
	Unit: Lump Sum				
	Output per hour: Lump Sum				
	Quantity: 110.70				
	Computed Duration: 15.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	120		
	b.Skilled Mason	6	120		
	c.Unskilled	6	120		
	Name of Capacity	No. of Unit/s	No. of Hour/s		
	Equipment				
	Generator set	1	120		
	Electric Drill	1	120		
	Name and Specifications	Unit	Quantity		
	Materials				
	Cladding w/ Complete Accessories	sq.m.	110.7		
	2" x 2" x 4.5mm Angle Bar	length	35		
	Electrodes 6013	box	4		
	Epoxy Primere	gal	4		
	Epoxy Reducer	gal	3		
	Oxygen	cyl	4		
	Pryce Gas	tank	1		
	4" Grinding Disc	pc	6		

<b>XIX</b>	Item Description : 1,008 Glass Works (Reflected Blue Glass)				
	Unit: Sq.m.				
	Output per hour: Sq.m.				
	Quantity: 143.82				
	Computed Duration: 20.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	160		
	b.Skilled Mason	10	160		
	c.Unskilled	10	160		
	Name and Specifications	Unit	Quantity		
	Materials				
	Reflected blue Glass w/ Complete Accessories	sq.m.	143.82		
<b>XX</b>	Item Description : Railing (Stair)				
	Unit: Lump Sum				
	Output per hour:				
	Quantity: 1.00				
	Computed Duration: 8.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	64		
	b.Skilled Mason	4	64		
	c.Unskilled	4	64		
	Name of Capacity	No. of Unit/s	No. of Hour/s		
	Equipment				
	Welding Machine	1	64		
	Electric Drill	1	64		

	Name and Specifications	Unit	Quantity		
	Materials				
	50mm Dia. Stainless. Pipe	length	30		
	1.5mm x 25mm x 50mm Stainless Tubular	length	78		
	Electrodes 6013	box	5		
	Epoxy Primere	gal.	7		
	Epoxy Reducer	gal.	4		
	12" Dia. Cutting Disc	pcs	12		
	4" Grinding Disc	pcs	18		
	PLUMBING WORKS				
<b>XXI</b>	Item Description : 1001 (8) Sewer Line Works				
	Unit: Lump Sum				
	Output per hour:				
	Quantity: 1.00 Lump Sum				
	Computed Duration: 4.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	32		
	b.Skilled Mason	2	32		
	c.Unskilled	2	32		
	Name and Specifications	Unit	Quantity		
	Materials				
	75mm Ø PVC Pipe	pcs	15		
	75mm Ø 1/8 Bend Long Sweep Elbow	pcs	15		
	75mm Ø Coupling	pcs	20		
	75mm Ø Clean Out	pcs	5		
	75mm Ø WYE	pcs	15		
	75mm x 50mm Reducer WYE	pcs	15		
	75mm x 45 Street Elbow	pcs	8		
	PVC Solvent Cement	Cans	10		

	<b>PLUMBING WORKS</b>				
<b>XXII</b>	Item Description : 1002 (8) Plumbing Fixtures				
	Unit: Lump Sum				
	Output per hour:				
	Quantity: 1.00				
	Computed Duration: 5.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	40		
	b.Skilled Mason	4	40		
	c.Unskilled	4	40		
	Name and Specifications	Unit	Quantity		
	Materials				
	Water Closet with Accessories	set	4		
	Floor Drain Stainer	pcs	6		
	Wall Hang Lavatory with Accessories	set	4		
	Gate Valve	pcs	1		
	Urinal w/ Fittings & Accessories	set	2		
	<b>PLUMBING WORKS</b>				
<b>XXIII</b>	Item Description : 1002 (8) Water Lines				
	Unit: Lump Sum				
	Output per hour:				
	Quantity: 1.00				
	Computed Duration: 10.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	80		
	b.Skilled Mason	1	80		

	c.Unskilled	1	80		
	Name and Specifications	Unit	Quantity		
	Materials				
	Toilet/C.R.				
	1" Ø PP-R Water Supply Line	pcs	15		
	1/2" Ø PVC Blue Pipe	pcs	15		
	Faucet Brass Plain Bibb	pcs	4		
	25mm Ø Elbow	pcs	30		
	25mm Ø Tee	pcs	40		
	20mm Ø Coupling	pcs	40		
	PVC Solvent Cement	Cans	10		
<b>XXIV</b>	Item Description : 1001 (9) Storm Drainage/ Catch Basin				
	Unit: Lump Sum				
	Output per hour:				
	Quantity: 1.00				
	Computed Duration: 12.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	96		
	b.Skilled Mason	6	96		
	c.Unskilled	6	96		
	Name and Specifications	Unit	Quantity		
	Materials				
	Sand	cu.m.	1.5		
	Gravel	cu.m.	3		
	Portland Cement	bags	60		
	CHB (100mm THK)	pcs	450		
	10mm Ø Reinforcing Steel Bar	length	30		
	1/4"x2'x4' Ordinary Plywood	pcs	15		
	Asst. C.W Nails	kgs	6		
	75mm Ø PVC Pipe	pcs	60		

	27mm Ø Elbow	pcs	48		
	25mm Ø Tee	pcs	30		
	20mm Ø Coupling	pcs	45		
	18" dia. RCCP	pcs	110		
	<b>ELECTRICAL WORKS</b>				
<b>XXV</b>	Item Description : 1100 (30) Conduits, Boxes and fitting				
	Unit: Lump Sum				
	Output per hour:				
	Quantity: 1.00				
	Computed Duration: 7.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Electrical Engineer	1	56		
	b. Skilled Electrician	3	56		
	c. Unskilled	3	56		
	Name and Specifications	Unit	Quantity		
	Materials				
	20mm dia. PVC x 3m	length	30		
	15mm dia. PVC x 3m	length	20		
	25mm dia. PVC x 3m	length	40		
	Junction Box 102x102x54 with Plate Cover	pcs	100		
	Poly Utility Box 50mm x 102mm x 54mm	pcs	20		
	Poly Square Box 102mm x 102mm x 54mm	pcs	20		
	Grounding Rod, 20mm dia. X 2400 mm	pcs	15		
	Grounding Rod, 25mm dia. X 3000 mm	pcs	15		
	Solvent Cement	can	40		
	<b>ELECTRICAL WORKS</b>				
<b>XXVI</b>	Item Description : 1101 (42) Wires and Wiring Devices				
	Unit: Lump Sum				

	Output per hour:				
	Quantity: 1.00				
	Computed Duration: 7.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Electrical Engineer	1	56		
	b. Skilled Electrician	4	56		
	Name and Specifications	Unit	Quantity		
	Materials				
	3.50mm <sup>2</sup> THHN	mts	120		
	8.0mm <sup>2</sup> THHN	mts	100		
	5.5mm <sup>2</sup> THHN	mts	80		
	Duplex Convenience Outlet, Grounding Type 15Amps, 250V	sets	40		
	Single Poll Wall Switch in One Switch Plate, 15Amps, 250V	sets	15		
	Two (2) Single Pole Wall Switch in One Switch Plate, 15Amps, 250V	sets	15		
	Three (3) Single Pole Wall Switch in One Switch Plate, 15Amps, 250V	sets	15		
	25 Ft Concrete Pole	set	1		
	10 KVA Transformer w/ Accessories	set	1		
	Electrical Tape	rolls	30		
	Rubber Tape	rolls	40		
	Masking Tape	rolls	40		
	<b>ELECTRICAL WORKS</b>				
<b>XXVII</b>	Item Description : 1103 (1) Lightning Fixtures				
	Unit: Lump Sum				
	Output per hour:				
	Quantity: 1.00				
	Computed Duration: 10.00 days				



	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Electrical Engineer	1	80		
	b.Skilled Electrician	3	80		
	c.Unskilled	3	80		
	Name and Specifications	Unit	Quantity		
	Materials				
	Two (2) 40 Watts, 230V, 60Hz AC, Recessed Type Flourescent Lighting Fixtures w/ 250mm x 1200mm Housing Box Type	set	70		
	5 Watts LED Bulb, 230V, 60Hz, AC, w/ Surfaced Type 6" Receptacle Lighting Fixtures	set	30		
<b>XXVIII</b>	Item Description : 1003 (3) Carpentry and jointry Works				
	Unit: Lump Sum				
	Output per hour:				
	Quantity: 1.00				
	Computed Duration: 30.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	240		
	b.Skilled Mason	14	240		
	c.Unskilled	14	240		
	Name and Specifications	Unit	Quantity		
	Materials				
	Executive Table	sets	10		
	Corner Disk L Shape Office Table	sets	10		
	Office Table	sets	35		

	Conference Table	sets	4		
	Office Partition (Workstation)	sets	15		
	Office Separated Chair	sets	60		
	Conference Chair	sets	30		
	Drawer Black Steel Office Filing Cabinet	sets	25		
	4 Drawer letter file/Filing Cabinet with Lock	sets	15		
<b>XXIX</b>	Item Description : 1018 Tile Works				
	Unit: Sq.m.				
	Output per hour: 3.90 Sq. m.				
	Quantity: 545.112				
	Computed Duration: 17.47 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	139.77		
	b.Skilled Mason	10	139.77		
	c.Unskilled	10	139.77		
	Name and Specifications	Unit	Quantity		
	Materials				
	40kg Portland Cement	bags	200		
	Cement Color	kg	70		
	Glazed Ceramic Floor Tiles 60 cm x 60 cm x 9mm thk.	pc	1,430.00		
	Steps Nosing (bronze) 6mm x 2 1/2" x 8'	length	25		
	Tile Adhesive(heavy duty) 25 kg/bag	bag	150		
	Tile Grout 5 kg/bag	bag	70		
	Unglazed Ceramic Floor Tiles 30 cm x 30 cm x 6mm thk	pc	40		
	Slate Finish (Nippon)	gal	40		
<b>XXX</b>	Item Description : 1032 Painting Works				

	Unit: Sq.m.				
	Output per hour: 5.0 Sq. m.				
	Quantity: 1,107.58 sq.m.				
	Computed Duration: 27.69 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	221.52		
	b.Skilled Mason	6	221.52		
	c.Unskilled	6	221.52		
	Name and Specifications	Unit	Quantity		
	Materials				
	Epoxy Primer	gal	80		
	Epoxy reducer	gal	25		
	Non-Sag Epoxy A & B	gal	20		
	Skimcoat	bags	80		
	Concrete Putty	gal	20		
	Flat Latex	gal	60		
	Semi Gloss Latex	gal	35		
	Enamel, Flatwall	gal	40		
	Glazing Putty	gal	20		
	Enamel, Semi Gloss	gal	20		
	Lacquer Thinner	gal	20		
	Concrete Neutralizer	gal	25		
	Paint Thinner	gal	20		
	9" Paint Roller	set	20		
	Baby Roller	set	20		
	4" Paint Brush	pcs	20		
	2" Paint Brush	pcs	20		
	120 Sand Paper	pcs	100		
	80 Sand Paper	pcs	150		
<b>XXXI</b>	Item Description : 1208 (1) Fire Alarm System & Fire Exit Stairway				
	Unit: Lump Sum				
	Output per hour: 1.00				

	Quantity: 1.00				
	Computed Duration: 16 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Electrical Engineer	1	128		
	b.Skilled (Electrician/Welder)	4	128		
	c.Unskilled	4	128		
	Name and Specifications	Unit	Quantity		
	Materials				
	Fire Alarm Control Panel	set	1		
	Fire Alarm Manual Station	sets	3		
	Fire Alarm Bell	sets	3		
	Fire Alarm Smoke Detector	sets	30		
	TF Wire # 18	Roll	15		
	3 Storey Fire Exit Stairway (Painted finish Customized G.I. Steel Stairway for 3 storey on 4 - 3" Dia. G.I post with railings and Landing every 1.5m height)	lot	1		
<b>XXXII</b>	Item Description : 1003 (3) Project Signs,Billboards,DSWD logo& Signage				
	Unit: Lump Sum				
	Output per hour: Lump Sum				
	Quantity: 1.00				
	Computed Duration: 10 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	80		
	b.Skilled Mason	5	80		
	c.Unskilled	5	80		

	Name and Specifications	Unit	Quantity		
	Materials				
	Stainless Steel for Lettering (DSWD R12)	set	1		
	Stainless Steel for Lettering (DSWD R12 w/ Logo)	set	1		
	Billboard Materials and Accessories	set	1		
	Plastic Signage (Operation division, Accounting/Budget Division, Supply Div., Fire Exit, CR Male & Female, Learning Center, Asst. Director Office, GASD/OFFICE, Director Office and PPD)	set	22		
<b>XXXIII</b>	Item Description : 311.00 PCPP ( 0.15m Thick)				
	Unit: Sq.m.				
	Output per hour: 2.0 Sq. m.				
	Quantity: 351.48				
	Computed Duration: 21.97 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	175.74		
	b. Skilled Mason	12	175.74		
	c. Unskilled	12	175.74		
	Name of Capacity	No. of Unit/s	No. of Hour/s		
	Equipment				
	1 bagger mixer	1	175.74		
	1 concrete vibrator	1	175.74		
	Plate Compactor	1	175.74		
	Name and Specifications	Unit	Quantity		

	Materials				
	a. Material				
	Portland Cement	bags	475		
	Washed Sand	cu.m	35		
	3/4 Crushed Cravel	cu.m	53		
	12mm dia. X 6m Def. bar	length	30		
	2"x8"x12' Coco Lumber 24 pcs	bd.ft	384		
<b>XXXIV</b>	Item Description : Construction of Safety and Health				
	Unit: Lump Sum				
	Output per hour: Lump Sum				
	Quantity: 1.00				
	Computed Duration: 120 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	960		
	b.Skilled Mason				
	c.Unskilled				
	Name and Specifications	Unit	Quantity		
	Materials				
	Skull guard	pcs	24		
	Safety boats	pcs	10		
	Safety Harness	pcs	12		
	Safety Goggles	pcs	10		
	Safety gloves	pcs	24		
	Alcohol (70%)	gal	2		
	Assorted Medicines	lot	1		
	Emergency Medical Kit	set	1		
	Disposable FaceMask	box	24		
<b>XXXV</b>	Item Description : Air Conditioning System				
	Unit:Units				

	Output per hour: Lump Sum				
	Quantity: 20.00				
	Computed Duration: 25.00 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	240		
	b.Skilled	10	240		
	c.Unskilled	10	240		
	Name and Specifications	Unit	Quantity		
	Materials				
	Wall Mounted Air Conditioner (2.5 Hp)	Units	19		
	Floor Mounted Air Conditioner (3.0 Hp)	Units	9		
<b>XXXVI</b>	Item Description : Perimeter Fencing				
	Unit:Lump Sum				
	Output per hour: Lump Sum				
	Quantity: 627.28				
	Computed Duration: 10 days				
	Designation	No. of Person/s	No. of Hour/s		
	Labor				
	a. Project Supervision (Foreman)	1	80		
	b.Skilled Mason	5	80		
	c.Unskilled	5	80		
	Name and Specifications	Unit	Quantity		
	Materials				
	Perimeter Fencing ( Painted 3mtrs heights, 4" chb plastered both sides on .2mx.2m	Sq.m	336		

	concrete column space at 3mtrs)				
	<b>Total Bid Price</b>				
<b>Total Bid Price (in words):</b>					



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

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

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

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

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

# Checklist of Technical and Financial Documents

## I. TECHNICAL COMPONENT ENVELOPE

### *Class “A” Documents*

#### Legal Documents

- ☐ (a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages);  
**Or**
- ☐ (b) Registration certificate from Securities and Exchange Commission (SEC), Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives or its equivalent document;  
**And**
- ☐ (c) 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;  
**And**
- ☐ (e) Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR).

#### Technical Documents

- ☐ (f) 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**
- ☐ (g) 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**
- ☐ (h) 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**
- ☐ (i) 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**
- ☐ (j) 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**
- ☐ (k) 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

- ☐ (l) 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**
- ☐ (m) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC).

**Class "B" Documents**

- ☐ (n) 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**

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

Other documentary requirements under RA No. 9184

- ☐ (p) Original of duly signed Bid Prices in the Bill of Quantities; **and**
- ☐ (q) Duly accomplished Detailed Estimates Form, including a summary sheet indicating the unit prices of construction materials, labor rates, and equipment rentals used in coming up with the Bid; **and**
- ☐ (r) Cash Flow by Quarter.



**TECHNICAL SPECIFICATIONS**  
**CONSTRUCTION WORKS**

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## 1.1 PRELIMINARIES

### 1 GENERAL

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#### 1.1 PRE-CONSTRUCTION WORK

The Engineer and Contractor will carry out a joint condition-in survey using video or digital photographs to record the condition of the site upon handover to the Contractor. This will determine the state of the site that the Contractor must hand back upon completion of the works. The Contractor will carry out a detailed site set out survey for the works.

A Pre-Construction Meeting will be held between the Engineer and the Contractor to review the following information:

- Condition-in Survey
- Site Survey
- Work Method Statement
- Program
- Schedule of Materials and Installed Equipment

If the Engineer approves the above documentation, then the Contractor will be issued with the Notice to Proceed. If the documentation is incomplete, the Contractor will have 3 calendar days to revise and resubmit the documentation for approval.

The contract period begins on the day the Notice to Proceed is issued.

The Contractor must mobilise on the project site within 7 calendar days of the date of issue of the Notice to Proceed.

#### **Site restrictions**

Site security limitations: Comply with any restrictions on site area, access or working times advised by the Engineer.

Access: Access on to and within the site, use of the site for temporary works and constructional plant, including working and storage areas, location of offices, workshops, sheds, roads and parking, is restricted to the areas shown on the drawings or as agreed with the Engineer.

#### **Occupied areas of site or buildings**

For the parts of the site designated as occupied areas in the **Occupied areas schedule**:

- Allow occupants to continue using the area for the required period.
- Make available safe access for occupants.
- Arrange work to minimise nuisance to occupants and ensure their safety.
- Protect occupants against weather, dust, dirt, water or other nuisance, by such means as temporary screens.

#### **Protection of persons and property**

Temporary works: Provide and maintain required barricades, guards, fencing, shoring, temporary roadways, footpaths, signs, lighting and traffic flagging.

Accessways, services: Do not obstruct or damage roadways and footpaths, drains and watercourses and other existing services in use on or adjacent to the site. Determine the location of such services. If damage occurs, immediately repair it at the Contractors cost.

Property: Do not damage property which is to remain on or adjacent to the site, including adjoining property encroaching onto the site. If damage occurs, immediately repair it at the Contractors cost.

### **Existing services**

Attend to existing services as follows:

- If the service is to be continued, repair, divert or relocate as required.
- If the service is to be abandoned, cut and seal or disconnect, and make safe.

Submit proposals to the Engineer for action for existing services before starting this work. Minimise the number and duration of interruptions.

### **Adjoining property**

Records: For properties described in the **Adjoining properties to be recorded schedule**:

- The Contractor is to inspect the properties with the Engineer and owners and occupants of the properties, before start of work.
- Make detailed records of conditions existing within the properties, especially structural defects and other damage or defacement.
- Arrange for at least 2 copies of each record, including drawings, written descriptions, and photographs, to be endorsed by the owners and occupants, or their representatives, as evidence of conditions existing before commencement of work.

Submit one endorsed copy of each record to the Engineer. The Contractor is to keep the other endorsed copy.

## **1.2 CONSTRUCTION PLANT**

### **Access**

Access route and site access point are as shown on the drawings or as agreed with the Engineer.

### **Use of existing services**

Existing services may be used as temporary services for the performance of the contract subject to conditions stated in the **Existing services schedule**.

### **Contractors Facilities and Work Practices**

The Contractor is required to provide adequate toilet and washroom facilities for his staff. These facilities shall be kept clean and serviceable at all times.

The Contractor is required to provide adequate first aid equipment on-site, failure of the Contractor to ensure the availability of first aid equipment on-site will result in an immediate „stop work“ order being issued. All costs and time delays resulting from any such „stop work“ order are entirely the Contractors responsibility.

A site office will be established by the Contractor at the work site. The location of the site office will be identified by the Engineer to the Contractor. The office will have a complete set of the contract documents.

The Contractor is to maintain a safe, healthy and tidy worksite at all times and all work activities are to be performed with protective and safety equipment appropriate for the task. The Contractor is entirely responsible for workplace safety and unsafe work practices will be identified and recommendations made for revised work methods as appropriate.

### **Project signboards**

Provide project-specific signboards and the following:

- Location, size and wording as directed by Engineer.
- Maintain in good condition for duration of the work.
- Remove on completion.

Obtain approval before display of advertisements or provision of other signboards.



### **1.3 BUILDING THE WORKS**

#### **Surveys**

Setting out:	Set out the works from the dimensioned drawings
Check surveys:	Check the setout regularly on site
Final survey:	Confirm final setout of roads, services and buildings on the as constructed drawings after Practical Completion

#### **Survey marks**

Definition: The term “survey mark” means a survey peg, bench mark, reference mark, signal, alignment, level mark or any other mark used or intended to be used for the purpose of setting out, checking or measuring the work.

Care of survey marks: Preserve and maintain the survey marks in their true positions. If the survey marks are damaged, immediately advise the Engineer and rectify the damage.

#### **Contractor's representative**

The contractor must employ a suitably experienced person as the Site Manager. This person must be on site during working hours, and fluent in English and technical terminology. The Contractor's Site Manager will have the authority to make all decisions concerning the project

#### **Program of work**

The Contractor is to provide a construction program which has the following information:

- Sequence of work.
- Allowance for holidays.
- Activity inter-relationships.
- Periods within which various stages or parts of the work are to be executed.

Time scale: Working days.

Update the program weekly. Identify changes since the previous version, and show the estimated percentage of completion for each item of work.

#### **Site meetings**

Hold and attend weekly site meetings throughout the contract and ensure attendance of appropriate subcontractors, the Site Manager and Engineer. The meeting schedule may be modified by the Engineer.

The meeting will consider the following items:

- Technical issues.
- Commercial issues.
- Program.
- Quality of work.

The Engineer is to keep minutes of site meetings. Within 3 working days after each meeting, submit to each party written copies of the minutes.

#### **Items supplied by owner**

Materials and other items specifically identified in the **Contract Documents** as client supplied products will be supplied free of charge to the Contractor for installation in the execution of the works. Unload and take delivery of them, inspect them for defects and then take care of them. If defects are found, advise. Return unused items to the owner.

## **1.4 COMPLETION OF THE WORKS**

### **Final cleaning**

Before Practical Completion, clean throughout, including interior and exterior surfaces exposed to view. Clean carpeted and soft surfaces. Clean debris from the site, roofs, gutters, down pipes and drainage systems. Remove waste and surplus materials.

### **Reinstatement**

Before practical completion, clean and repair damage caused by installation or use of temporary work and restore existing facilities used during construction to original condition.

### **Adjoining property**

At practical completion, for properties described in the **Adjoining properties to be recorded schedule** inspect the properties with the Engineer and owners and occupants of the properties, recording any damage that has occurred since the pre-commencement inspection.

### **Post construction Works**

The Contractor will provide the following documentation after all site construction has been completed:

- Warranty Statement
- Material Test Certificates
- As-Built Drawings

A condition-out survey will be conducted with the Contractor and Engineer at which damages caused by the Contractor will be identified. The Engineer will determine if the Contractor is to make repairs or if the damage will be deducted from the Contractor's final invoice.

### **Removal of plant**

Within 10 working days after practical completion, remove temporary works and construction plant no longer required. Remove the balance before the end of the defects liability period.

## **1.5 PAYMENT FOR THE WORKS**

### **Anticipated progress claims schedule**

The Contractor is to submit a schedule of anticipated progress claims which will be made throughout the contract. Submit a revised schedule with each progress claim.

## **1.6 MISCELLANEOUS**

### **Compliance with the law**

The Contractor is responsible for compliance with all requirements of authorities.

## **1.2 GENERAL REQUIREMENTS**

### **1 GENERAL**

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#### **1.1 CONTRACT DOCUMENTS**

##### **Drawings**

Large scale drawings take precedence over small scale drawings. Written or calculatable dimensions take precedence over scaled dimensions.

If there are any errors in dimensions, set out or size, immediately notify the Engineer.

##### **Bill Of Quantities**

If there are any errors in description of items or omissions in the BOQ, immediately notify the Engineer.

If there are any items which are unclear or are not available within the project program, immediately notify the Engineer.

##### **Services diagrammatic layouts**

Layouts of service lines, plant and equipment shown on the drawings are diagrammatic only, except where figured dimensions are provided or calculable.

Before commencing work:

- Obtain measurements and other necessary information.
- Coordinate the design and installation in conjunction with all trades.

##### **Site Levels**

Spot levels and identified levels on drawings take precedence over contour lines and ground profile lines.

#### **1.2 INSPECTION**

##### **Inspection Notification Schedule**

The Contractor is to notify the Engineer when the items identified in the **Inspection Notification Schedule** are ready for inspection.

##### **Notice**

Minimum notice for inspections to be made on site is 24 hours for off site personnel, 4 hours for onsite personnel.

If notice of inspection is required in respect of parts of the works that are to be concealed, advise when the inspection can be made before concealment.

#### **1.3 SUBMISSIONS**

##### **Samples**

Submit nominated samples for approval of the Engineer.

If it is intended to incorporate samples into the works, submit proposals for approval. Only incorporate samples in the works which have been approved. Do not incorporate other samples.

Keep endorsed samples in good condition on site, until practical completion.

##### **Shop drawings**

General: If required, submit dimensioned drawings showing details of the fabrication and installation of services and equipment, including relationship to building structure and other services, cable type and size, and marking details.

Diagrammatic layouts: Coordinate work shown diagrammatically in the contract documents, and submit dimensioned set-out drawings.

## 2 PRODUCTS

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### 2.1 TESTS

#### **Notice**

Give notice of time and place of nominated tests.

#### **Attendance**

The Contractor is to carry out and attend all tests where nominated in this specification.

As a minimum, the Contractor will carry out the following tests:

- Testing of the granulometric composition and strength of all aggregates to be used.
- Testing of all concrete in accordance with the regulations and methods as stated in Concrete section of the specification.
- Upon completion of the electrical installation a test and measurement of the earth reading for the building is to be undertaken. The results of this test are to be certified by a properly qualified electrical engineer and the results are then to be presented to the Engineer for acceptance.
- Full load testing and commissioning of all components of the electrical system is to be included for the various components of the electrical system. The electrical works will not be approved until the entire system has been successfully tested and signed off in the presence of a suitable qualified UNOPS engineer.
- The Contractor will supply all necessary appliances and labor for testing of the complete water supply system at such time and as directed by the Engineer. Such testing shall as a minimum require the pressurizing of the complete water supply system to a pressure of not less than 4.5bar. The pipe work and fittings shall retain this pressure for a minimum of 1 hour following the commencement of the test.
- All drains shall be hydraulically tested to a minimum of 1500 mm head and no drains shall be covered up until such test has been made and repeated as necessary until passed to the approval of the Engineer. Access plugs and caps shall be removed, greased, refitted and made sound prior to the final testing.

**NOTE: Alternative locally available and used testing methods and regulations may be proposed by the contractor as a part of their bid proposal, but are subject to DSWD approval and acceptance.**

### 2.2 MATERIALS AND COMPONENTS

All manufactured items must new and be approved by the DSWD Site Supervisor prior to their purchase and installation.

The material provided by the Contractor will be of a suitable quality for the intended purpose.

Where a specific product or supplier is identified, the Contractor will interpret the specification to read as stated or of equal quality.

### **Consistency**

For the whole quantity of each material or product use the same manufacturer or source and provide consistent type, size, quality and appearance.

### **Manufacturers' or suppliers' recommendations**

Proprietary items: Select, if no selection is given, and transport, deliver, store, handle, protect, finish, adjust, prepare for use, and provide manufactured items in accordance with the current written recommendations and instructions of the manufacturer or supplier.

Proprietary systems/assemblies: Assemble, install or fix in accordance with the current written recommendations and instructions of the manufacturer or supplier.

Project modifications: Advise of activities that supplement, or are contrary to, manufacturer's or suppliers' written recommendations and instructions.

### **Proprietary items**

Identification of a proprietary item does not necessarily imply exclusive preference for the item so identified, but indicates the necessary properties of the item.

Alternatives: If alternatives are proposed, submit proposed alternatives and include samples, available technical information, reasons for proposed substitutions and cost. If necessary, provide an English translation. State if provision of proposed alternatives will necessitate alteration to other parts of the works and advise consequent costs.

## **3 EXECUTION**

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### **3.1 COMPLETION**

#### **Warranties**

Name the owner as warrantee in conformance with the **Warranty schedule**. Register with manufacturers as necessary. Retain copies delivered with components and equipment.

Commencement: Commence warranty periods at practical completion or at acceptance of installation, if acceptance is not concurrent with practical completion.

## **2.1 DEMOLITION**

## **1 GENERAL**

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### **1.1 INTERPRETATION**

#### **Demolished materials classes**

Salvaged for re-use: Demolished materials scheduled for re-use in the works.

Salvaged for disposal: Demolished materials scheduled for re-use elsewhere.

Demolished for re-use: Non-scheduled demolished materials proposed by contractor for re-use in the works.

Demolished for removal: Other demolished materials.

### **1.2 INSPECTIO**

#### **N Notice**

Give sufficient notice so that inspection may be made of the following:

- Adjacent structures before commencement of demolition.
- Propping of structures prior to demolition works.
- Structure after stripping and removal of roof coverings and other external cladding.
- Underground structures after demolition above them.

## **2 PRODUCTS**

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### **2.1 DEMOLISHED MATERIALS**

#### **Demolished materials**

Ownership: Ownership of demolished materials remains vested with the Employer or Client. Reuse: If it is proposed to reuse demolished materials in the works, submit proposals.

Salvage: Recover without damage materials to be salvaged, for reuse in conformance with the prevailing site conditions or as specifically proscribed in the Contract Documents.

Removal: Remove from the site demolished materials which are the property of the contractor. Do not burn or bury on site.

Transit: Prevent spillage of demolishing materials in transit.

## **3 EXECUTION**

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### **3.1 SUPPORT**

#### **Temporary support**

If temporary support is required, certification for its design and installation is required from a professional engineer engaged by the contractor.

Until permanent support is provided, provide temporary support for sections of existing buildings which are to be altered and which normally rely for support on work to be demolished.

Support excavations for demolition of underground structures. Provide supports to adjacent structures where necessary, sufficient to prevent damage resulting from the works.

#### **Permanent supports**

If permanent supports for adjacent structures are necessary and are not described, give notice and obtain instructions.

### **3.2 PROTECTIO**

#### **Encroachment**

Prevent the encroachment of demolished materials onto adjoining property, including public places.

#### **Weather protection**

If walls or roofs are opened for alterations and additions or the surfaces of adjoining buildings are exposed, provide temporary covers to prevent water penetration. Provide covers to protect existing plant and equipment and materials intended for re-use.

#### **Dust protection**

Provide dust-proof screens, bulkheads and covers to protect existing finishes and the immediate environment from dust and debris.

#### **Security**

If a wall or roof is opened for alterations and additions, provide security against unauthorised entry to the building.

### **3.3 DEMOLITION**

#### **Explosives**

Do not use explosives in the demolition process.

### **3.4 HAZARDOUS MATERIALS**

#### **General**

General: Give notice immediately hazardous materials or conditions are found, including the following:

- Asbestos or material containing asbestos.
- Flammable or explosive liquids or gases.
- Toxic, infective or contaminated materials.
- Radiation or radioactive materials.
- Noxious or explosive chemicals.
- Tanks or other containers which have been used for storage of explosive, toxic, infective or

contaminated substances.

### **3.5 COMPLETION**

#### **Notice of completion**

Give at least 3 working days" notice of completion of demolition so that adjacent structures may be inspected following completion of demolition.

Make good any damage arising out of demolition work. Obtain written acceptance from the owner of each adjoining property of completeness and standard of making good.

#### **Temporary support**

General: Clear away at completion of demolition.

## **2.2 SITE PREPARATION**

### **1 GENERAL**

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#### **1.1 AIMS**

##### **Responsibilities**

The aim of this work section is to clear the site and put in place adequate environmental controls to allow the commencement of earthworks and/or building works.

#### **1.2 SUBMISSION**

##### **S Execution**

Submit the methods and equipment proposed for the earthworks, including the following:

- Dewatering and groundwater control and disposal of surface water.
- Control of erosion and contamination of the site, surrounding areas and drainage systems.
- Dust control.
- Noise control.

### **2 EXECUTION**

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#### **2.1 TREES**

##### **Work near trees**

Keep the area within the dripline free of construction material and debris. Do not place bulk materials and harmful materials under or near trees. Do not place spoil from excavations against tree trunks. Prevent wind-blown materials such as cement from harming trees and plants.

Prevent damage to tree bark. Do not attach stays, guys and the like to trees.

If excavation is required near trees to be retained, give notice and obtain instructions. Open up excavations under tree canopies for as short a period as possible.

Use hand methods to locate, expose and cleanly remove the roots on the line of excavation. If it is necessary to excavate within the drip line, use hand methods such that root systems are preserved intact and undamaged.

Backfill to excavations around tree roots with backfill free from weed growth and harmful materials. Place the backfill layers, each of 300 mm maximum depth, compacted to a dry density similar to that of the original or surrounding soil. Do not backfill around tree trunks to a height greater than 300 mm above the original ground surface. Immediately after backfilling, thoroughly water the root zone surrounding the tree.

Water trees as necessary, including where roots are exposed at ambient temperature > 35°C.

#### **2.2 EXISTING**

##### **SERVICES Marking**

Before commencing earthworks, locate and mark existing underground services in the areas which will be affected by the earthworks operations including clearing, excavating and trenching.

##### **Excavation**

Do not excavate by machine within 1 m of existing underground services.

## **2.3 ENVIRONMENTAL**

### **PROTECTION**

#### **Dust protection**

Provide dust-proof screens, bulkheads and covers to protect existing finishes and the immediate environment from dust and debris.

#### **Dewatering**

Keep groundworks free of water. Provide and maintain slopes and drains on excavations and embankments to ensure free drainage. Place construction, including fill, masonry, concrete and services, on ground from which free water has been removed. Prevent water flow over freshly laid work.

## **2.4 SITE CLEARING**

### **Extent**

Clear only the following site areas:

- Areas to be occupied by works such as buildings, paving, excavation, regrading and landscaping.
- Other areas designated to be cleared.

Contractor's site areas: If not included within the areas specified above, clear generally only to the extent necessary for the performance of the works.

### **Clearing and grubbing**

Remove everything on or above the site surface, including rubbish, scrap, grass, vegetable matter and organic debris, scrub, trees, timber, stumps, boulders and rubble.

Remove tree stumps and roots over 75 mm diameter to a minimum depth of 500 mm below subgrade under buildings, embankments or paving, or 300 mm below finished surface in unpaved areas. Holes remaining after grubbing shall be backfilled with sand material to prevent ponding of water. The material shall be compacted to the relative density of the existing adjacent ground material.

Old works: Remove old works, including slabs, foundations, pavings, drains and manholes found on the surface unless identified on the drawings to remain intact.

### **Topsoil**

All topsoil shall be stripped over the area on which construction or grading takes place. This topsoil shall be carefully stockpiled to be reused for landscaping on completion of the building operations or otherwise disposed of as directed.

## **2.5 DISPOSAL OF MATERIALS**

### **Disposal**

General: Remove cleared and grubbed material from the site.



## 2.3 EARTHWORK

### 1 GENERAL

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#### 1.1 INTERPRETATION

##### Definitions

For the purposes of this worksection the definitions given below apply.

- Bad ground: Ground unsuitable for the purposes of the works, including fill liable to subsidence, ground containing cavities, faults or fissures, ground contaminated by harmful substances and ground which is or becomes soft, wet or unstable.
- Line of influence: A line extending downward and outward from the bottom edge of a footing, slab or pavement and defining the extent of foundation material having influence on the stability or support of the footings, slab or pavement.

#### 1.2 RECORDS OF MEASUREMENT

##### Excavation and backfilling

Do not commence backfilling or place permanent works in the excavation until the following have been agreed and recorded:

- Depths of excavations related to the datum.
- Final plan dimensions of excavations.

Method of measurement: To be jointly agreed between the Engineer and Contractors Site Manager unless otherwise agreed.

#### 1.3 INSPECTION

##### Notice

Give sufficient notice so that inspection may be made of the following:

- Excavation completed to contract levels or founding material.
- Filling completed to contract levels.

#### 1.4 TOLERANCES

##### Tolerances

Finish the surface to the required level, grade and shape within the following tolerances:

- Under building slabs and loadbearing elements: + 0, -40 mm.
- Pavement subgrades; + 0, - 60 mm.
- Other ground surfaces:  $\pm 50$  mm, provided the area will drain and matches adjacent construction where required.

### 2 PRODUCTS

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#### 2.1 FILL MATERIALS

##### Fill material generally

Fill material is to be inorganic, non-perishable material.

Excluded materials:

- Organic soils.
- Materials contaminated through past site usage.
- Silts or silt-like materials.
- Fill containing wood, metal, plastic, boulders or other deleterious material.

Structural fill - used as support for shallow foundations, paved areas, and slabs each with loadings of 3660 kgf/m<sup>2</sup> or more, for storage tanks, truck turnarounds, and base course and sub-base course for roadway pavements.

**Re-use of material recovered from excavation**

Re-use excavated material elsewhere on site if approved by the Engineer.

### **3 EXECUTION**

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#### **3.1 REMOVAL OF TOPSOIL**

**General**

Remove topsoil to all areas to be cut, areas to be filled, areas to be occupied by structures, pavements, embankments and the like.

Maximum depth: 100 mm.

**Re-use of removed topsoil**

Re-use removed topsoil elsewhere on site as directed by the Engineer.

#### **3.2 EXCAVATION**

**Extent**

Excavate over the site to give correct levels for construction, pavements, filling and landscaping.

Excavate for footings, pits and shafts, to the required sizes and depths. Confirm that bearing capacity is adequate.

**Proof rolling**

Proof roll excavations for pavements, filling and non-spanning slabs on ground to determine the extent of any bad ground.

All foundations shall be carried to good bearing soil and to the minimum depth below finish grade as indicated on the design drawings. If the requisite bearing is not encountered at the indicated minimum depth, or should over-excavation occur, the following shall be complied with:

- a. Minor variations shall be corrected by the use of a lean concrete having an ultimate strength in excess of 70 kg/cm<sup>2</sup>.
- b. Major variations shall be referred to the Engineer for resolution.

Unless otherwise specified on the design drawings or specifications, earth fill beneath foundation shall be Class I structural fill

The final work of soil excavating and earth filling shall be completed just prior to the placing of the reinforcing steel and concrete. In order to prevent excessive moisture changes in the foundation-supporting soil, the following options are recommended for all spread footing, mat foundation, and mass excavations:

- a. Foundations shall be poured within 24 hours of excavation.
- b. Water shall be sprayed as required to maintain insitu soil moisture.
- c. A 50 mm thick lean concrete slab may be poured as soon as practical after excavation. This slab may also be used to provide a good working surface for construction activities. Lean concrete shall have an ultimate strength in excess of 70 kg/cm<sup>2</sup>.

Prior to pouring the seal slab (or foundation concrete if seal slab is not necessary) the Engineer shall inspect the foundation subgrades material to ensure it is suitable for supporting footings. Should the

material(s) be different than those revealed by the borings, the Engineer shall decide on corrective measures, if necessary, to ensure the satisfactory performance of the foundation soils. The corrective measures may consist of one or more of the following:

- a. Removal of the foundation subgrades material to a certain depth and replacing it with compacted structural fill/lean concrete.
- b. Pumping out ground water from or around the foundation excavation.
- c. Sprinkling of water on dry competent subgrades soils, etc.

#### **Disposal of excess excavated material**

Remove excess excavated material from the site and dispose of legally.

### **3.3 BEARING SURFACES**

#### **General**

Provide flat bearing surfaces for loadbearing elements including footings. Step to suit changes in levels. Make the steps to the appropriate courses if supporting masonry.

### **3.4 REINSTATEMENT OF EXCAVATION**

#### **General**

Where excavation is deeper than the required depth, fill and consolidate to the correct depth.

### **3.5 SUPPORTING EXCAVATIONS**

#### **Provision of supports**

Provide temporary supports to all excavations greater than 1.8m deep. Confirm type of supports and level of protection required with the Engineer.

#### **Removal of supports**

Remove temporary supports progressively as backfilling proceeds.

### **3.6 ADJACENT STRUCTURES**

#### **Temporary supports**

Provide supports to adjacent structures where necessary, sufficient to prevent damage arising from the works. This applies to all structures where the line of influence is interfered with by the proposed excavation works.

Lateral supports: Provide lateral support using shoring.

Vertical supports: Provide vertical support where necessary using piling or underpinning or both.

#### **Permanent supports**

If permanent supports for adjacent structures are necessary and are not described, give notice and obtain instructions.

### **3.7 PREPARATION FOR FILLING**

#### **General**

Prepare the ground surface before placing fill (including topsoil fill), ground slabs or load bearing elements. Shape to assist drainage. Compact the ground exposed after stripping or excavation.

### **3.8 PLACING FILL**

#### **General**

Layers: Place fill in maximum 15cm horizontal layers across the fill area.

Mix: Place fill in a uniform mixture.

Protection: Protect the works from damage due to compaction operations. Where necessary, limit the size of compaction equipment or compact by hand. Commence compacting each layer at the structure and proceed away from it.

The placement and compaction criteria of fill shall be to the approval of the Engineer.

2.3.1.7 All excess or unsuitable excavated material is to be removed from site and taken away to a locally approved dumping site.

### **3.9 COMPACTION REQUIREMENTS FOR FILL AND SUBGRADE**

#### **Density**

Compact the subgrade exposed by excavation to a minimum depth of 15cm. Compact each layer of fill to the required depth and density, as a systematic construction operation. Shape surfaces to provide drainage and prevent ponding.

Density of all layers of filling are to be approved by the Engineer before subsequent layers are placed. Maximum rock and lump size in layer after compaction: 2/3 compacted layer thickness.

#### **Moisture content**

Adjust the moisture content of fill during compaction in order to achieve the required density. Do not allow subgrade or fill layers to dry out after compaction before placing subsequent layers of fill. Do not over water filling to greater than moisture content of adjoining undisturbed ground.

## **2.4 SERVICE TRENCHING**

### **1 GENERAL**

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#### **1.1 INSPECTION**

##### **Notice**

Give sufficient notice so that inspection may be made at the following stages:

- Service trenches excavated before laying the service.
- Services laid in trenches and ready for backfilling.

### **2 EXECUTION**

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#### **2.1 EXCAVATING**

##### **Excavation**

Excavate for underground services, to required levels and grades. Generally make the trenches straight between inspection points and junctions, with vertical sides and uniform grades.

##### **Trench widths**

General: Keep trench widths to the minimum required for laying and bedding of the relevant service and construction of pits.

##### **Trench depths**

If excavation is necessary below the zone of influence of the underside of adjacent footings, give notice, and provide support for the footings as instructed.

##### **Obstructions**

Clear trenches of sharp projections. Cut back roots encountered in trenches to at least 600 mm clear of services. Remove other obstructions including stumps and boulders which may interfere with services or bedding.

##### **Dewatering**

Keep trenches free of water. Place bedding material, services and backfilling on firm ground free of surface water.

##### **Excess excavation**

If trench excavation exceeds the correct depth, reinstate to the correct depth and bearing value using compacted bedding material or sand stabilised with 1 part of cement to 20 parts of sand by weight.

#### **2.2 BACKFILLING**

##### **General**

Backfill service trenches as soon as possible after the service has been laid and bedded, if possible on the same working day. Place the backfill in layers maximum 150 mm thick and compact to approval of Engineer.

##### **Backfill material**

General fill with no stones greater than 25 mm occurring within 150 mm of the service, or other materials as required for particular services or locations.

Under roads and paved areas and within 4 m of building: Coarse sand, controlled low strength material or fine crushed rock.

In topsoil areas: Complete the backfilling with topsoil for at least the top 100 mm.

## **2.3 REINSTATEMENT OF**

### **SURFACES General**

Reinstate existing surfaces removed or disturbed by trench excavations to match existing and adjacent work.

## **2.5 LANDSCAPE – WALLS AND FENCES**

### **1 GENERAL**

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#### **1.1 INSPECTION**

##### **Notice**

Give sufficient notice so inspection may be made of the following:

- Setting out before commencement of construction.
- Filter fabric and subsurface drainage in place before backfilling.

### **2 PRODUCTS**

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#### **2.1 TIMBER**

##### **Hardwood**

All hardwood in timber fences is to be best quality without any rot, significant knots, twists, or other defects which may affect its strength.

Preservative treatment: Provide only timbers with preservative treatment painted on the timbers surface where the timber is in the ground, or ensure that all timber is highly resistant to rot.

#### **2.2 STEEL**

##### **Steel tubes and channels**

All steel tubes and channels used for posts, rails, stays are to be painted or galvanised to ensure the maximum lifetime for the item without significant maintenance. Refer to **Finishes Schedule**.

##### **Wire**

Chainwire, cable wire, tie wire and barbed wire are to be galvanised or other suitable metallic finish for maximum lifetime.

#### **2.3 CONCRETE**

##### **WALLS General**

Concrete walls and concrete foundations are to be constructed as shown on the drawings.

#### **2.4 STONE**

##### **WALLS Walling**

##### **stone**

Natural stone: Stone of uniform quality, sound and free from defects liable to affect its strength, appearance or durability.

Field stone: Local weathered uncut random sized natural stones.

Quarried stone: Cut or uncut random or regular size stone.

#### **2.5 CRIB WALLS**

##### **General**

Type: Proprietary system of interlocking precast concrete units with selected backfill placed and compacted progressively to form a retaining wall.

## **2.6 BRICK**

### **WALLS General**

Brick walls on stone or concrete foundations are to be constructed as shown on the drawings.

## **3 EXECUTION**

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### **3.1 GENERAL**

#### **Set out**

General: Set out the wall and fence lines and mark the positions of posts, gates and bracing panels.

#### **Clearing**

Extent: Except trees or shrubs to be retained, clear vegetation within 1 m of the landscape walls. Grub out stumps and roots of removed trees or shrubs and trim the grass to ground level, but do not remove the topsoil.

#### **Excavation**

Excavate for foundations and footings.

#### **Earth footings**

Backfill with earth around posts, compacting firmly by hand or machine in 150 mm deep layers.

#### **Concrete footings**

In ground: Place mass concrete around posts and finish with a weathered top falling 25 mm from the post to ground level.

On slabs: Provide welded and drilled post flanges and fix with 3 masonry anchors per post.

Strip footings: Place mass concrete or reinforced concrete footings for walls. Refer to drawings for details.

## **2.6 LANDSCAPE – SOILS AND PLANTING**

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### **1 GENERAL**

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#### **1.1 SUBMISSIONS**

##### **Suppliers**

Obtain statements from suppliers of plant materials, giving the following:

- Particulars of the supplier's experience in the required type of work.
- Lead times for delivery of the material to the site.

#### **1.2 INSPECTION**

##### **Notice**

Give sufficient notice so that inspection may be made of the following:

- lawns prepared before seeding
- plant holes excavated and prepared for planting
- setout of gravel paths prepared for filling

## 2 PRODUCTS

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### 2.1 TOPSOIL

#### Source

Import topsoil unless the topsoil type can be provided from material recovered from the site.

#### Additives

Use additives to raise topsoil to the required standard approved by the Engineer.

### 2.2 COMPOST AND

#### FERTILISER Compost

Provide well rotted vegetative material or animal manure, free from harmful chemicals, grass and weed growth.

#### Fertiliser

Provide proprietary fertilisers, delivered to the site in sealed bags marked to show manufacturer or vendor, weight, fertiliser type, recommended uses and application rates.

### 2.3 GRAVEL PATHS

Provide paths constructed with consolidated small gravel chippings and concrete edging pavers where shown on plans.

## 3 EXECUTION

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### 3.1 PREPARATION

#### Vegetative spoil

Remove vegetative spoil from site. Do not burn without the approval on the Engineer.

### 3.2 ROCKWORK

#### Rock work

General: Place rocks while ground formation work is being carried out. Provide site rock, otherwise provide imported rock. Bury rock two thirds by volume, with weathered faces exposed. Protect the weathered faces from damage.

Site rock: Stockpile for future placement and accessibility for lifting. Dispose of other rock off site.

Imported rock: Provide rock which has been selected before delivery.

### 3.3 SUBSOIL

#### Ripping

Rip parallel to the final contours wherever possible. Do not rip when the subsoil is wet or plastic. Do not rip within the dripline of trees and shrubs to be retained.

Ripping depths: Rip the subsoil to the following typical depths:

- Compacted subsoil: 300 mm.
- Heavily compacted clay subsoil: 450 mm.

#### Planting beds

Excavated: Excavate to bring the subsoil to at least 300 mm below finished design levels. Shape the subsoil to fall to subsoil drains where applicable. Break up the subsoil to a further depth of 100 mm.

Unexcavated: Remove weeds, roots, builder's rubbish and other debris. Bring the planting bed to 75 mm below finished design levels.

#### Cultivation

Minimum depth: 100 mm.

Services and roots: Do not disturb services or tree roots; if necessary cultivate these areas by hand.

Cultivation: Thoroughly mix in materials required to be incorporated into the subsoil. Cultivate manually within 300 mm of paths or structures. Remove stones exceeding 50 mm, and weeds,

rubbish or other deleterious material brought to the surface during cultivation. Trim the surface to design levels after cultivation.

#### **Additives**

Apply additives after ripping or cultivation and incorporate into the upper 100 mm layer of the subsoil. Refer to the **Soil additives schedule**.

### **3.4 TOPSOIL**

#### **Placing topsoil**

Spread the topsoil on the prepared subsoil and grade evenly. Ensure that grassed areas may be finished flush with adjacent hard surfaces such as kerbs, paths and mowing strips.

Contamination: Where diesel oil, cement or other toxic material has been spilt on the subsoil or topsoil, excavate the contaminated soil, dispose of it off the site, and replace it with site soil or imported topsoil.

Finishing: Feather edges into adjoining undisturbed ground.

#### **Consolidation**

Compact lightly and uniformly in 150 mm layers. Produce a finished topsoil surface which has the following characteristics:

- Smooth and free from stones or lumps of soil.
- Graded evenly into adjoining ground surfaces.
- Ready for planting.

Refer to the **Soil additives schedule. Topsoil**

#### **depths**

Spread topsoil to the following typical depths:

- Excavated planting areas: If using organic mulch, 200 mm.
- Irrigated grassed areas generally: 150 mm.
- Non-irrigated grass areas: 100 mm.

#### **Surplus topsoil**

Spread surplus topsoil on designated areas on site, if any; otherwise, dispose off site. Designated areas to be determined by the Engineer.

### **3.5 GRASS SEEDING**

#### **Preparation**

Prepare the areas to be sown. Spread the fertiliser evenly over the cultivated bed within 48 hours before sowing, and rake lightly into the surface. If a prepared area becomes compacted from any cause before sowing can begin, rework the ground surface before sowing.

#### **Sowing**

Do not sow if frost is likely before the plant has reached an established state, or in periods of extreme heat, cold or wet, or when wind velocities exceed 8 km/h. Provide even distribution. Lightly rake the surface to cover the seed.

#### **Rolling**

Roll the seed bed immediately after sowing.

Roller weight (maximum):

- Clay and packing (heavy) soils: 90 kg/m width.
- Sandy and light soils: 300 kg/m width.

#### **Watering**

Before germination: Water the seeded area with a fine spray until the topsoil is moistened to its full depth. Continue watering until germination to keep the surface damp and the topsoil moist but not waterlogged.

After germination: Water to maintain a healthy condition, progressively hardened off to the natural climatic conditions.

#### **Germination**

Maintain sown areas until healthy grass covers the whole of the seeded area.

Reseeding: If germination has not been attained within one month, reseed the sown areas.

#### **Weeding**



Remove weeds that occur in sown areas. Where necessary spray with a selective weedkiller for broad leaved weeds. Do not spray grass seeded areas within 3 months of germination.

**Protection**

Protect the newly sown areas against traffic until well established. Protection method to be approved by the Engineer.

**Mowing**

Mow to maintain the grass height within the required range. Do not remove more than one third of the grass height at any one time. Carry out the last mowing within 7 days before the end of the planting establishment period. Remove grass clippings from the site after each mowing.

**3.6 PLANTS****Plants**

Characteristics: Provide plants with the following characteristics:

- Large healthy root systems.
- Vigorous, well established, free from disease and pests.
- Suitable for planting in the natural climatic conditions prevailing at the site.

Replacement: Replace damaged or failed plants with plants of the same type and size.

**Plant containers**

Supply plants in weed-free containers of the required size.

Open rooted stock: If trees are to be supplied as open rooted stock, ensure this is appropriate to the species, variety, size, and time of year for planting.

Refer to the **Plant Schedule**.

**Labelling**

Label at least one plant of each species or variety in a batch with a durable, readable tag.

**Storage**

Deliver plant material to the site on a day to day basis, and plant immediately after delivery.

**3.7 PLANTING****Individual plantings in grassed areas**

Excavate a hole to twice the diameter of the root ball and at least 100 mm deeper than the root ball. Break up the base of the hole to a further depth of 100 mm, and loosen compacted sides of the hole to prevent confinement of root growth.

**Locations**

If it appears necessary to vary plant locations and spacings to avoid service lines, or to cover the area uniformly, or for other reasons, obtain directions from the Engineer.

**Planting conditions**

Do not plant in unsuitable weather conditions such as extreme heat, cold, wind or rain. In other than sandy soils, suspend excavation when the soil is wet, or during frost periods.

**Watering**

Thoroughly water the plants before planting, immediately after planting, and as required to maintain growth rates free of stress.

**Placing**

Remove the plant from the container with minimum disturbance to the root ball, ensure that the root ball is moist and place it in its final position, in the centre of the hole.

**Fertilising**

In planting beds and individual plantings, place fertiliser pellets around the plants at the time of planting.

**Watering basins for plants in grass**

Except in irrigated grassed areas and normally moist areas, construct a watering basin around the base of each individual plant, consisting of a raised ring of soil capable of holding at least 10 L.

**3.8 STAKES AND TIES****Stakes**

Use Hardwood stakes, straight, free from knots or twists, pointed at one end.

Drive stakes into the ground at least one third of their length, avoiding damage to the root system.

Stake sizes:

- For plants  $\geq 2.5$  m high: Three 50 x 50 x 2400 mm stakes per plant.
- For plants 1 – 2.5 m high: Two 50 x 50 x 1800 mm stakes per plant.

#### **Ties**

Provide ties fixed securely to the stakes, one tie at half the height of the main stem, others as necessary to stabilise the plant.

Tie types for plants < 2.5 m high: 50 mm sack webbing stapled to the stake.

### **3.9 GRAVEL PATHS**

#### **Pavement**

Use small size gravel in layers not exceeding 150mm thick to form paths where shown on drawings.

Colour and type of gravel to approval of Engineer. Retain sides of path with either:

- Precast decorative concrete paving edge strips, colour to approval of Engineer.
- Concrete kerbs

### **3.10 PLANTING ESTABLISHMENT**

#### **Period**

The planting establishment period commences at the date of practical completion and finishes at the date of final certificate.

#### **Existing planting and grass**

Where existing grass or planting is within the landscape contract area, maintain it as for the corresponding classifications of new grass or planting.

#### **Recurrent works**

Throughout the planting establishment period, carry out maintenance work including, watering, mowing, weeding, rubbish removal, reseeding, staking and tying, replanting, cultivating, and keeping the site neat and tidy.

## **3.1 CONCRETE - GENERAL**

### **1 GENERAL**

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#### **1.1 INSPECTION**

##### **Notice**

Give sufficient notice so that inspection may be made of the following:

- Base or subgrade before covering.
- Membrane or film underlay installed on the base.
- Completed formwork, and reinforcement, cores, fixings and embedded items fixed in place.
- Surfaces or elements to be concealed in the final work before covering.
- Commencement of concrete placing.

#### **1.2 SUBMISSIONS**

##### **Products –**

##### **proposals**

Curing compounds: If it is proposed to use a liquid membrane-forming curing compound submit certified test results for water retention.

Curing by the covering sheet method: Submit details of the proposed covering material.

Repair materials: Submit proposals for epoxy resin/grout and elastomeric sealant.

#### **1.3 TESTS**

##### **General**

Perform tests of the type and frequency necessary to adequately control the materials and processes used in the construction of the works.

**Compliance assessment tests**

Timing: Obtain materials samples at the time of delivery to the site.

Location: Sample from selected sample sites within designated uniform test lots, consisting of an area placed, or compacted or both in one day. Test lots must be uniform in terms of material properties and density.

Specimen type: A set of compression test specimens shall consist of four 200 x 200 x 200 mm cubes, each cube being one specimen.

The specimens within each set shall be tested at the following ages in conformance with the **drawings and specifications**.

- One at 7 days for information.
- Two at 28 days. The 28 day strength shall be taken as the average of the two specimens. If one specimen in this test shows evidence of improper sampling, molding or testing, it shall be discarded. The remaining specimen shall be considered the test result. Should both specimens show the specified defects, the entire test shall be discarded.
- The fourth shall be retained as a spare to be tested as required.

**Discharge slump tests**

Carry out slump tests at approximately one quarter and three quarter points of the load during discharge.

Working slump: 80mm

Maximum slump: 110 mm. Note concrete with slump greater than this value will be rejected and removed from the site at the contractors cost.

**Flexural strength assessment of concrete**

Acceptance criterion: The average strength of any set of 3 consecutive project samples must not exceed the specified maximum value.

**Tests schedule**

Samples	ASTM C172
Curing	ASTM C31
Testing	ASTM C39
Slump Determination	ASTM C143
Air Content	ASTM C231 or C173

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**2 EXECUTION**
**2.1 PRODUCTS**
**Reinforcement**

All reinforcing shall be supported and wired together to prevent displacement by construction loads, or the placing of concrete, beyond the tolerances specified in ACI 301. Any tack or spot welding of reinforcement shall not be performed without approval from the Engineer.

Reinforcement shall be free of loose rust and of any other coating which may adversely affect the bond.

Splices in bar reinforcement shall be located and lapped as shown on the design drawings. Bars in lapped splices shall be in contact unless otherwise shown on the design drawings. Additional splices, if required, shall be made only at locations, and in a manner approved by the Engineer. Welded splices shall not be used. All lap splices in bar reinforcement shall be fully in compliance with ACI 318-02.

Welded wire fabric used in concrete paving shall have lapped splices made so that the overlap between the outermost cross wires of each fabric sheet is at least 50 mm.

Unless specifically indicated on the design drawings, splicing by means of proprietary mechanical splices shall not be used.

Concrete spacers, metal or plastic bar spacers i.e. chairs, shall be used for obtaining proper spacing of reinforcement from the bottom and sides of formwork.

**Dowels**

Provide each dowel in one piece, straight, cut accurately to length with ends square and free from burrs. Fix in locations as shown on the design drawings.

### **Formwork**

Construct formwork with timber or steel elements to support the concrete for full duration of critical curing period. Construct in a durable manner with sufficient props and fixings to ensure that the formwork remains in position at all times.

### **Aggregate**

Aggregate size:

- For fixed form placement: < 40 mm.
- For slip form placement: To be a size compatible with the paving machine.

Washing: Wash aggregate as necessary or as directed to remove significant dust or achieve requirements for soluble salt content or concrete drying shrinkage.

### **Cement**

Cement shall conform to the requirements of ASTM specification C-150 Type 1 or similar approved standard for normal Portland cement.

Cement shall be free from any hardened lumps and foreign matter. It shall have a minimum of 90% of particles by weight passing the 75-micron sieve, an initial setting time in excess of 30 minutes and a final setting time of less than 7 hours.

Cement shall be stored in a waterproof shaded area. The cement stacks shall be placed at a minimum distance of 300mm from the walls. The damp proof floor shall be constructed by raising it minimum 300mm above the ground.

### **Curing products**

Curing compounds: Obtain approval from the Engineer for all curing compounds prior to use.

Covering sheet materials: To be opaque polyethylene film, or burlap-polyethylene sheet, or equivalent material.

### **Concrete**

Ready-mixed concrete shall comply with M-150 (1:2:4) for non-reinforced mass concrete and M-200 (1:1.5:3) for reinforced concrete and the requirements of these standards.

On site batch mixed concrete shall have characteristics and proportions of concrete ingredients which conform to those specified in M-150 (1:2:4) and M-200 (1:1.5:3).

Admixtures: Introduce in solution in a portion of the mixing water. Ensure a uniform distribution of the admixture in the batch within the mixing period.

Mixing time: Measure the mixing time after solid materials are in the mixer, provided that mixing water is introduced before a quarter of the mixing time has elapsed. Increase mixing time if necessary to obtain the required uniformity and consistence of concrete. Do not overmix such that additions of water are needed.

Transport: Transport and discharge the concrete without segregation.

Elapsed delivery time: Discharge truck mixed concrete within a time (t hours) determined as follows, where T is the temperature of the concrete in degrees Celsius:

$$t = 2 - 0.05T.$$

## **3 EXECUTION**

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### **3.1 PLACING- GENERAL**

#### **Cold weather**

Cold weather concreting shall be in accordance with the following:

- a. The guidelines of ACI 306R shall be followed when the Forecasted Mean Daily Temperature drops below 4°C for three consecutive days. The minimum concrete temperature when delivered at the site shall be in accordance with Table I.
- b. If water or aggregate is heated above 38°C, the water shall be combined with the aggregate in the mixer before cement is added. Cement shall not be mixed with water or with mixtures of water and aggregate having a temperature greater than 38°C.
- c. Concrete shall only be poured when the ambient temperature is rising.
- d. All concrete shall be insulated from freezing for the greater of following:

1. 3 days
  2. Until the concrete reaches an in-place compressive strength of 35 kg/cm<sup>2</sup>,
- e. All materials shall be free from frost.

f. Accelerating admixtures shall not be used without approval from the Engineer. Maintain the concrete at a temperature of at least 10°C for at least 24 hours after placing.

**Admixtures**

General: Do not add calcium chloride, salts, chemicals or other material to the mix to lower the freezing point of the concrete.

**TABLE I - MINIMUM COLD WEATHER TEMPERATURE**

AIR TEMPERATURE °C	MINIMUM CONCRETE TEMPERATURE °C	
	For Sections With Smallest Dimension Less Than 300 mm	For Sections With Smallest Dimension 300 mm Or Greater
-1 to 4	16	13
-18 to -1	18	16
Below -18	21	18

**Hot weather**

Avoid premature stiffening of the mix and reduce water absorption and evaporation losses. If the temperature of the surrounding air is higher than 32°C:

- Mix, transport, place and compact the concrete as rapidly as possible, and cover with an impervious membrane or hessian kept wet until moist curing begins.
- Hold the concrete to a temperature < 32°C when placed.

Hot weather concreting shall be in accordance with the following:

- a. Concrete temperatures shall be kept within desirable limits using methods recommended in ACI 305R.
- b. For mass concrete, i.e., concrete sections having a minimum dimension of 750mm or greater, the maximum acceptable concrete temperature is 21°C at time of discharge.
- c. For other concrete structures, the maximum acceptable concrete temperature is 32°C at time of discharge.
- d. If ice is used as part of the mixing water, mixing should be continued until the ice is completely melted.
- e. Retempering shall not increase the water content above that in the mix design.

**Placing in fixed forms**

Place concrete uniformly over the width of the slab and so that the face is generally vertical and normal to the direction of placing. Hand spread concrete using shovels, not rakes.

Compact concrete using internal mechanical vibration of sufficient amplitude to produce noticeable vibrations at 300 mm radius. Insert vibrators into the concrete to the depth which will provide the best compaction, but not deeper than 50 mm above the surface of the subbase, and for a duration sufficient to produce satisfactory compaction, but not longer than 30 seconds in any one location.

**Elapsed delivery time**

General: Ensure that the elapsed time between the wetting of the mix and the discharge of the mix at the site is in conformance with the **Elapsed delivery time table**. Do not discharge below 10°C or above 32°C.

**Elapsed delivery time table**

Concrete temperature at time of discharge (°C)	Maximum elapsed time (hours)
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<b>Concrete temperature at time of discharge (°C)</b>	<b>Maximum elapsed time (hours)</b>
10 – 24	2.00
24 – 27	1.50
27 – 30	1.00
30 – 32	0.75

### **Finishing**

Immediately after placement and spreading and compaction of the plastic concrete, start finishing operations to achieve finish shown on the drawings.

### **Curing**

Protect fresh concrete from premature drying and from excessively hot or cold temperatures. Maintain the concrete at a reasonably constant temperature with minimum moisture loss for the curing period.

- Temperature: Maintain the concrete at a temperature > 5°C for at least 7 days.

Curing compound method: Spray the entire surface including edges using a mechanical sprayer, at a uniform application rate of at least 0.35 L/m<sup>2</sup>. Respray defective areas within 30 minutes. Respray within 3 hours after heavy rain. Apply as a continuous coating without visible breaks or pinholes.

Covering sheet method: Immediately after finishing operations cover concrete using damp hessian or cotton mats overlapped at least 150 mm and anchored against displacement by wind or other interference. Keep the mats continuously damp until covered by the covering sheet material. Repair tears and the like immediately.

- Joint sawing: Sheet materials may be removed for the minimum distance and period to permit joint sawing, provided the concrete is kept moist by other means.

Moist curing method: Immediately after finishing operations keep the concrete surface continuously damp by spraying constantly with water, fog, or mist, using suitable spraying equipment.

Minimum curing time: 7 days.

## **3.2 CORES, FIXINGS AND EMBEDDED ITEMS**

### **Adjoining elements**

For adjoining elements to be fixed to or supported on the concrete, provide for the required fixings. If required, provide for temporary support of adjoining elements during construction of the concrete.

### **Protection**

Grease threads. Protect embedded items against damage.

Compatibility: Ensure inserts, fixings and embedded items are compatible with each other, with the reinforcement and with the concrete mix to be used.

Corrosion: If in external or exposed locations, galvanize anchor bolts and embedded fixings.

### **Structural integrity**

Fix cores and embedded items to prevent movement during concrete placing. In locating cores, fixings and embedded items, reposition but do not cut reinforcement, and maintain cover to reinforcement.

### **Tolerances**

Maximum deviation from correct positions:

- Cores and embedded items generally: 10 mm.
- Other fixing bolts: 3 mm.

## **3.3 COMPACTION**

### **Compaction**

Methods: Use immersion and screed vibrators accompanied by hand methods as appropriate to remove air bubbles and to fully compact the mix.

Vibrators: Do not allow vibrators to come into contact with partially hardened concrete, reinforcement or items including pipes and conduits embedded in concrete. Do not use vibrators to move concrete along the forms. Avoid over-vibration that may cause segregation.

### **Placing**

Use placing methods which avoid segregation and loss of concrete, and which minimise plastic settlement. Maintain a generally vertical and plastic concrete edge at faces of a pour.

Layers: Place concrete in layers  $\leq 300$  mm thick, such that each succeeding layer is compacted before previous layer has taken initial set.

### **Rain**

General: Do not expose concrete to rain before it has been placed and set.

## ***Finishing, Curing, Form Removal and Patching***

Finishing - Unless otherwise required on the design drawings or specifications for the project, concrete surfaces shall be finished as follows:

### **Pavement and Walks**

- a. Top surfaces shall be brought to proper level with a screed.
- b. After the water sheen has disappeared, the surface shall be floated with wood or metal floats or with a finishing machine using float blades.
- c. Before the concrete has thoroughly hardened, the surface shall be roughly scored using a steel wire or stiff coarse fibre broom. The depth of scoring shall not exceed 3 mm.
- d. Control joints may be formed by saw cut or cast-in-place plastic strips. Joints to be sawed shall be done as soon as the concrete surface is firm enough not to be torn or damaged by the blade.

### **Building Floor and Roof Slabs**

- a. Screed and float as specified in Paragraph 4.4.8.1.1 for pavements and walks.
- b. All roof slabs and floor slabs receiving a tile-floor or other type of finish shall be steel trowel finished.
- c. Other building floors shall be given a wood float finish.

### **Equipment Foundations, Building Foundations, Trenches, Pits, Boxes, and Sumps**

- a. Screed and float as specified in Paragraph 4.8.1.1 for pavements and walks.
- b. A wood float finish shall be provided. Surfaces to receive grout or concrete shall be roughened.
- c. No finish is required for surfaces exposed to forms other than patching of surface defects.

## **Curing**

Curing to maintain a satisfactory moisture content and concrete temperature shall be performed using the applicable methods and procedures recommended in ACI 305R, ACI 306R, and ACI 308.

Curing by any of the methods specified shall continue for a minimum of 7 days for concrete at a temperature of 50°F (10°C) or more. When high early strength concrete is used, the curing period may be reduced to a minimum of 3 days.

During the curing period, the concrete shall be protected from damage by construction equipment, materials, rain, running water, heavy shock, and vibration.



In cold weather, when the mean daily temperature is less than 4°C, the concrete shall be maintained between 10°C and 21°C for the required curing period. Necessary arrangements shall be made in advance for heating, covering, insulating, or enclosing the concrete work to maintain the required temperature and moisture conditions. When heaters using combustible fuels are used in an enclosure, the heaters shall be vented to the outside of the enclosure.

In hot weather, necessary arrangements shall be made in advance for protective measures needed to prevent rapid drying of the concrete. These protective measures shall be started as quickly as finishing and hardening will allow.

### Form Removal

The age after which forms may be removed from the concrete is given in Table IV. The values given in Table IV shall be considered as a minimum.

The actual time of removal shall be determined by inspection and good judgement.

Prior to or after removal of forms, curing protection shall continue, for the period of time shown in Table IV or for the period of time specified in Paragraph 2.3.5.2.2, whichever is greater.

TABLE IV - MINIMUM AGE FOR SAFE REMOVAL OF FORMS – DAYS

CONSTRUCTION	PROBABLE MEAN OUTSIDE TEMPERATURE AFTER PERIOD OF PROTECTION	CONCRETE TEMPERATURE DURING PROTECTION			
		10°C		21°C	
		TYPE OF CEMENT (ASTM C150)			
		I	III	I	III
	Above 10°C	2	1	2	1
Plinths, Walls, Columns and Other Vertical or Near Vertical Sections	0°C to -4°C	11*	6*	8*	4*
	-4°C to -9°C	21*	6*	16*	12*
	Below -9°C	29*	26*	23*	20*
Formed Grade Beams, Elevated Slabs and Beams, Spans 3m or less	Above 10°C	8	3	4	3
	0°C to -4°C	11	5	4	3
	-4°C to -9°C	21	16	16	12
	Below -9°C	29	25	23	20

Spans Larger than 3m	Above 0°C	20	14	20	14
	Below 0°C	28	28	28	28

NOTE: \* Forms may be removed at two days for concrete using Type I cement or at one day for concrete using Type III cement. However, curing protection must be continued for the period shown for the expected exposure condition.

The concrete structure shall be evaluated for the effect of any superimposed loadings applied before the concrete attains its compressive design strength.

### **Patching**

Immediately after form removal all exposed concrete surfaces shall be inspected for defects. Fins, honeycomb, and other defects shall be repaired before the concrete is dry. Defective areas such as honeycomb shall be cut back to sound material before repair.

The patching material shall match the color of the original concrete as closely as possible. One-third of the gray cement may be replaced with white Portland cement to help in getting a color match.

### **Backfill**

Unless otherwise specified on the design drawings or specifications, backfill around foundations shall be Class II structural fill.

### **Formwork**

Formwork shall be designed, erected, supported, braced, and maintained so that it will sustain all vertical and lateral loads until such loads can be supported by the concrete structure itself.

Forms shall conform to the shape and dimensions of the members shown on the design drawings.

Forms and their supports shall be designed so as not to damage previously placed concrete.

Forms shall be true, rigidly constructed, and sufficiently tight to prevent leakage of cement paste.

All forms for exposed work shall be free of defects likely to cause imperfections on the surface of the concrete.

Forms shall be suitable for the work to be performed and may be of dressed lumber, plywood, metal, or other suitable materials.

Chamfer strips are required for all exposed corners.

Form material which is to be reused shall have damaged parts repaired and the concrete side thoroughly cleaned before reusing.

Temporary openings shall be provided at the base of column and wall forms to facilitate cleaning and inspection.

Adjustable type shoring can be used for supporting roof forms or elevated floors.

Tolerances for forms shall be as follows:

Variations from plumb in columns, piers and walls is 6 mm in 3 m, but not to exceed 25 mm total.

Variation from level in slab and beam soffits (horizontal undersides) 6 mm in 3 m but not more than 18 mm unless otherwise noted on the design drawings. Where necessary to maintain this tolerance, the formwork shall be cambered to compensate for anticipated deflections in the formwork due to the weight and pressure of the fresh concrete and due to construction loads.

Form ties shall be standard shop ties or screw ties. The holes left by the removal of the tie ends shall be patched with mortar.

The form release agent shall be applied before any bar supports and reinforcing steel is placed. Excess form release agent shall not be allowed to stand in puddles in the form or come in contact with concrete against which fresh concrete will be placed.

Forms shall be constructed to facilitate their removal without damage to the concrete. Forms shall be preferably removed in the following order (1) columns, (2) sides of beams and girders, (3) bottom of slabs, beams, and girders.

## **Reinforcement and Anchor Bolts**

### **Reinforcement**

All reinforcing shall be supported and wired together to prevent displacement by construction loads, or the placing of concrete, beyond the tolerances specified in ACI 301.

Any tack or spot welding of reinforcement shall not be performed without approval by the UNOPS Site Supervisor.

Reinforcement shall be free of loose rust and of any other coating which may adversely affect the bond.

Splices in bar reinforcement shall be located and lapped as shown on the design drawings. Bars in lapped splices shall be in contact unless otherwise shown on the design drawings. Additional splices, if required, shall be made only at locations, and in a manner approved by Engineering. Welded splices shall not be used.

Welded wire fabric used in structural concrete shall have lapped splices such that the overlap between the outermost cross-wires of each fabric sheet is not less than the spacing of the cross-wires plus 50 mm. Fabric shall be supported, in the same manner as reinforcing bars, to place the fabric in its proper location within the concrete member.

Welded wire fabric used in concrete paving shall have lapped splices made so that the overlap between the outermost cross wires of each fabric sheet is at least 50 mm.

In lieu of adequate support of the welded wire fabric, the fabric shall be lifted during placing of concrete to ensure proper positioning in the concrete.

Unless specifically indicated on the design drawings, splicing by means of proprietary mechanical splices shall not be used.

Concrete spacers, metal or plastic bar spacers i.e. chairs, shall be used for obtaining proper spacing of reinforcement from the bottom and sides of formwork.

Unless otherwise specified on the design drawings, the minimum concrete cover over reinforcement shall be as given in Table V (see next page).

TABLE V – MINIMUM CONCRETE COVER

REINFORCEMENT LOCATION	MINIMUM THICKNESS OF CONCRETE COVERING
Cast against and permanently exposed to earth	75 mm
Exposed to earth or weather	
#19 through #57 bars	50 mm
#16 bars and smaller	37 mm
Not exposed to weather or in contact with the ground slabs, walls, joist:	
#57 bars	37 mm
#36 bars and smaller	18 mm
Beams, girders, columns	37 mm
Principal reinforcement, ties, stirrups or spirals	

**Anchor Bolts**

Anchor bolts shall be placed as shown on the design drawings and to the following tolerances:

- a. Bolt projections: plus 6 mm, minus 0 mm
- b. Bolt location-without sleeves:  $\pm 3$  mm
- c. Bolt location-with sleeves:  $\pm 5$  mm

Bolt sleeves with open tops shall be packed to keep concrete out of the sleeve during the pour.

Sleeves shall ultimately be grouted in accordance with C23-1CS.

**Vertical elements**

In vertical elements, limit the free fall of concrete to 1500 mm per 100 mm element thickness, up to a maximum free fall of 3000 mm, using enclosed vertical chutes or access hatches in forms.

**3.4 CONSTRUCTION JOINTS**

**Location**

Do not relocate or eliminate construction joints, or make construction joints not shown on the drawings. If emergency construction joints are made necessary by unforeseen interruptions to the concrete pour, submit a report on the action taken.

**Joint preparation**

Roughen and clean the hardened concrete joint surface. Remove loose or soft material, free water, and foreign matter. Dampen the surface just before placing the fresh concrete and coat with a neat cement slurry.

**3.5 EXPANSION JOINTS**

Joint filling: Fill with jointing materials. Finish visible jointing material neatly flush with adjoining surfaces.

Preparation: Before filling, dry and clean the joint surfaces, and prime.

Watertightness: Apply the jointing material so that joints subject to ingress of water are made watertight.

<b>3.2 CONCRETE- FINISHES</b>
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**1 GENERAL**
**1.1 TOLERANCES**
**General**

Unformed surfaces: Confirm conformance with the **Tolerance classes table** for the class of finish nominated using a straight edge placed anywhere on the surface in any direction.

**Tolerances class table**

Class	Measurement	Maximum deviation (mm)
A	3 m straight edge	3
B	3 m straight edge	6
C	600 mm straight edge	6

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**2 PRODUCTS**
**2.1 MATERIALS**
**Surface hardeners, sealers and protectors**

Supply: If required by the project documentation, provide proprietary products in accordance with the manufacturer's written requirements.

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**3 EXECUTION**
**3.1 SURFACE MODIFIERS**
**General**

Application: Apply to clean surfaces in accordance with the manufacturer's requirements.

**3.2 UNFORMED SURFACES**
**General**

Screed and level slab surfaces to finished levels, to tolerance class C.

**Finishing methods**

Broom finish: After floating draw a broom or hessian belt across the surface to produce a coarse even-textured slip-resistant transverse-scored surface.

Machine floated finish: After screeding and when the concrete has stiffened sufficiently, work the slab surface using a machine float. Hand float in locations inaccessible to the machine float. Cut and fill to tolerance class B and refloat immediately to a uniform, smooth texture.

Scored or scratch finish: After screeding, give the surface a coarse scored texture using a stiff brush or rake drawn across the surface before final set.

Steel trowelled finish: After machine floating, use power trowels to produce a smooth surface relatively free from defects. Then, when the surface has hardened sufficiently, use steel hand trowels to produce the final finish free of trowel marks and defects, and uniform in texture and appearance, to tolerance class A.

Wood float finish: After screeding, machine produce the final finish using a wood float, to tolerance class B.

### **Polished finishes**

Water blast: After steel trowelling, water blast the cured surface to provide texture or to form patterns without exposing the coarse aggregate using medium pressure water jets. Ensure that aggregate is not removed to a depth greater than 10mm.

Applied finish: To a steel trowel finished surface, apply a proprietary liquid or dry shake material in accordance with the manufacturer's written requirements.

Burnished finish: Continue steel trowelling until the concrete surface attains a polished or glossy appearance.

### **3.3 FORMED**

#### **SURFACES General**

Provide formed concrete finishes in conformance with the **drawings**.

Damage: Do not damage concrete works through premature removal of formwork.

#### **Curing**

General: If forms are stripped when concrete is at an age less than the minimum curing period, commence curing exposed faces as soon as the stripping is completed.

#### **Finishing methods**

If exposed formed concrete elements are to have a finish other than off the form, provide details of proposed procedures. If not identified otherwise, all formed surfaces will be off form finish.

Exposed aggregate finish: Remove the vertical face forms while the concrete is green but set. Wet the surface and scrub using stiff fibre or wire brushes, using clean water freely, until the surface film of mortar is mechanically removed, and the aggregate uniformly exposed. Do not use acid etching. Rinse the surface with clean water.

Floated finishes:

- Sand floated finish: Remove the forms while the concrete is green. Wet the surface and rub using a wood float. Rub fine sand into the surface until a uniform colour and texture are produced.
- Grout floated finish: Remove the forms while the concrete is green. Dampen the surface and spread a slurry, using hessian pads or sponge rubber floats. Remove surplus slurry and work until a uniform colour and texture are produced.

#### **Surface repairs**

Surface repair method: Before commencing repairs, submit proposals to the Engineer for approval.

## **3.5 BRICKWORK**

### **1 GENERAL**

#### **1.1 INSPECTION**

##### **Notice**

Give sufficient notice so that inspection may be made of the following:

- Set out of brickwork to lintels, arches and other architectural features.
- Damp-proof courses, in position.
- Lintels, in position.

### **2 PRODUCTS**

#### **2.1 MATERIALS**

##### **Bricks**

Bricks shall be made from good brick earth free from saline deposits, and shall be sand molded. They shall be thoroughly burnt by coal without being vitrified, of uniform and good color, shall be regular and uniform in size, shape and texture with sharp square edges and parallel faces. They must emit a clear metallic ringing sound when struck one against another. They shall be free from flaws, cracks, chips, stones, and nodules of lime or canker. A Brick shall not absorb more than 1/6th of its weight of water after being soaked for one hour.

**General**

The Engineer prior to use in the Works shall approve the use of bricks.

Bricks not meeting the above requirements shall not be used in brickwork.

Bricks should have the following dimensions after burning: 250mm x 120mm x 70mm. The unit weight of First and Second Class Bricks shall not be less than 1100 kg/m<sup>3</sup>.

Brickwork shall only commence when the Engineer has approved the bricks. The Contractor may then only change the source of supply of bricks after samples from the new supplier have similarly been

Only well burned clay bricks should be used for all brick masonry

work. Traditional bricks of size 24 x12 x 6 cm should be used.

Bricks should be free from saline deposits, be regular and uniform in size with sharp square edges and parallel faces.

Bricks shall be homogenous in texture and shall emit a clear metallic ringing sound when struck one against the other.

All brick used shall be free from cracks, chips, flaws and other blemishes.

**Mortar materials**

Cement shall conform to the requirements of ASTM specification C-150 Type 1 or similar approved standard for normal Portland cement.

- White cement: Iron salts content  $\leq$  1%.
- Off-white cement: Iron salts content  $\leq$  2.5%.

Lime: Confirm source of Lime with Engineer to ensure highest quality Lime is used in the mortar. Protect from damage on site and store minimum 300mm above ground in waterproof storage facility.

Sand: Fine aggregate with a low clay content selected for grading, sharp and free from efflorescing salts. River or pit sand should be sharp, angular, hard, clean uncoated particles free from clay and organic impurities.

Water: Water to be used for the mixing of mortar should be clean and free from oil, acid, alkali, salts, organic materials or other substances that are harmful to the mortar mix.

Measurement of volume: Measure binders and sand by volume using buckets or boxes. Do not allow sand to bulk by absorption of water.

**Mortar**

Ratio of mix for brick masonry shall be 1:4, cement-sand.

Mortar joints shall not exceed 8mm in thickness; all joints shall be fully filled with mortar.

All sand and cement for mortar shall be mixed in the correct proportion by the use of:

- a. Wooden box.
- b. Bucket, plastic or steel.

All sand and cement for brick masonry shall be fully mixed prior to the addition of water on a water proof surface. The mortar shall be fully mixed by turning at least 3 times following addition of the water.

Every course of brickwork shall be horizontal and the resulting constructed wall shall be vertical.

Under no circumstances will vertical joints in consecutive layers of brickwork be accepted.

No broken or damaged bricks are to be incorporated into the masonry.

Bricks shall be laid with the frog facing upwards, except for the final (top) course which shall be laid with the frog facing down.

Brickwork constructed during the course of one shift (8 hours) shall not exceed 1m in height.

When stopping incomplete brickwork, the bricks shall be stepped at an angle not to exceed 45°.

All joints shall be raked and the brickwork faces cleaned at the end of each shift (8 hours).

All brickwork is to be kept wet for a period of not less than 10 days following its construction. At the end of each shift the top of all brickwork being cured is to be flooded with water.

### **Mortar for Masonry Plaster**

Ratio of mix for plaster mortar shall be 1:2:9, cement-lime-sand.

All sand, lime and cement for plaster mortar shall be mixed in the correct proportion by the use of:

- a. Wooden box.
- b. Bucket, plastic or steel.

All sand, lime and cement for plaster masonry shall be fully mixed prior to the addition of water on a water proof surface. The mortar shall be fully mixed by turning at least 3 times following addition of the water.

Plaster mortar is to be applied in layers not to exceed 12mm in thickness.

The finished face of plaster work is to be straight, fair and vertical.

### **Cement**

The cement to be used in the work should be ordinary Portland cement complying with ASTM C-150 or BS-12.

All cement should be protected from moisture and damage in transit any deteriorated or hardened cement will not be permitted in the works and is to be removed from site at the contractors' expense.

### **Sand**

River or pit sand should be sharp, angular, hard, clean uncoated particles free from clay and organic impurities.

Well graded sand must be used for all cement work. Sand required for brickwork must be finer than that for stone work.

For ordinary masonry work, concrete and first coat of plaster, the sand should pass through a 2.00 mm sieve.



## Aggregates

Aggregates must be clean and free from clay, loam, vegetable and organic material. A well graded crushed rock or gravel that contains both sand and stones should be used for concrete work.

The size of aggregates should not be larger than 30 mm.

The aggregates should be washed at least once in clean water immediately before being used in concrete production.

## 2.2 COMPONENTS

### Nailing blocks

Solid timber, or hollow timber box filled with earthen mortar. Timber unseasoned or thoroughly pre-wetted.

### Steel components, including reinforcement

All steel components to be galvanised for maximum durability after incorporation into the structure.

### Window and Door lintels

Lintels: Use steel, concrete or timber lintels in accordance with the manufacturers' technical literature or conform to the **Steel angle and T-lintels table**.

**Steel angle and T-lintels table**

Maximum span (mm)	Wall height above ≤ 600 mm			Wall height above > 600 mm, ≤ 1800 mm		
	Angle lintel size	T-Lintel dimensions: H x W x T (mm)	Bearing min. (mm)	Angle lintel size	T-Lintel dimensions: H x W x T (mm)	Bearing min. (mm)
1000	Two 75 x 50 x 5 Unequal angles	81 x 150 x 6	100	Two 125 x 75 x 8 Unequal angles	136 x 150 x 6	200
2000	Two 100 x 75 x 6 Unequal angles	136 x 150 x 6	150	Two 150 x 90 x 8 Unequal angles	156 x 150 x 6	200
2400	Two 125 x 75 x 8 Unequal angles	156 x 150 x 6	150	Two 150 x 90 x 10 Unequal angles	160 x 150 x 10	250
2800	Two 150 x 90 x 8 Unequal angles	158 x 150 x 8	200	Two 150 x 100 x 10 Unequal angles	210 x 200 x 10	300
3000	Two 150 x 90 x 10 Unequal angles	160 x 150 x 10	200	Two 150 x 100 x 12 Unequal angles	210 x 200 x 10	300

### Timber lintels

Size: Width of the wall and in conformance with the **Timber lintels height table**.

Grade: Best quality of imported Russian timber or suitable approved local timber.

Bearing: 300 mm (minimum).

**Timber lintels height table**

Maximum span (mm)	Lintel height (mm)
1200	150
1800	150
2400	200
3000	250

### Timber fixing plates

Size: 200 x 50 mm (minimum).

### **Holding-down bolts**

Type: 10 mm diameter threaded rod.

Termination: Horizontal 5 x 100 x 200 mm steel plate, weld-fixed, or with nuts.

Depth of embedment:

- Length (minimum): 450 mm.

## **3 EXECUTION**

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### **3.1 GENERAL**

#### **General**

Construction of masonry brickwork shall not commence until the Engineer has accepted the footings on which it is to be placed.

Brickwork shall be built plumb, curved or battered as shown on the Drawings or as may be required, by skilled masons and properly supervised workmen. Bricks shall be clean and if necessary, they shall be scrubbed. Bricks shall be soaked in water for at least one hour before use.

Unless otherwise specified bricks shall be laid in English Bond, with frogs downward. All horizontal joints shall be parallel and level. Vertical joints in alternate courses shall come directly over one another. Joint thickness shall be 6mm and shall in no case exceed 8mm. The height of four courses

including 4 bed joints shall rise 300mm. Set out brickwork with joints of uniform width and minimise cutting of masonry units.

Walls shall always be carried up regularly along their entire length unless otherwise directed by the Engineer.

#### **Mortar mix**

Mortar mixing shall be done in a mechanical mixer unless the Engineer specifically permits hand mixing. If hand-mixing is done, the operation shall be carried out on a clean watertight platform and cement & sand shall be first mixed dry in the required proportion to obtain a uniform color and then the mortar shall be mixed for at least two minutes after addition of water.

Cement Mortar shall be mixed in such quantities as can be used in the work within 30 minutes. Mortar, which has taken initial set, shall not be used, nor shall it be re-mixed with fresh mortar.

Preparing lime putty:

- Using hydrated lime: Add lime to water in a clean container and stir to a thick creamy consistency. Leave undisturbed for at least 16 hours. Remove excess water and protect from drying out.
- Using quicklime: Run to putty as soon as possible after receipt of quicklime. Partly fill clean container with water, add lime to half the height of the water, then stir and hoe ensuring that no lime remains exposed above the water. Continue stirring and hoeing for at least 5 minutes after all reaction has ceased, then sieve into a maturing bin. Leave undisturbed for at least 14 days. Protect from drying out.

Mortar proportions (cement:lime:sand):As defined on the drawings.

Sand stockpile: Ensure sand is dry and stored undercover to avoid errors in volume batching during the mixing process.

#### **Protection from contamination**

Protect masonry materials and components from ground moisture and contamination.

#### **Building in**

Embedded items: Build in fixing blocks, brackets, lintels and accessories as the construction proceeds.

Steel door frames: Fill the backs of jambs and heads solid with mortar as the work proceeds.

#### **Joining to existing**

If joining to existing work is required, provide a straight joint. Do not tooth new masonry into existing work.

#### **Chasing**

Chasing of brickwork shall be to the **Brickwork chasing table** and subject to the following limitations:

- Parallel chases on opposite faces of a wall shall not be closer than 600 mm to each other.

#### **Brickwork chasing table**

<b>Brick thickness (mm)</b>	<b>Depth of chase (maximum mm)</b>
-----------------------------	------------------------------------

More than 250 thick	35
250 thick	25
100 thick non load bearing walls only	20

### Joint finish

Lay brickwork on a full bed of mortar. Fill perpends solid.

Finish:

- Externally: Tool to give a dense water-shedding finish for face brickwork or rake not more than 10mm to give a key for render finish.
- Internally: If wall is to be plastered, rake not more than 10 mm to give a key.

### Temporary support

If the final stability of the brickwork or blockwork is dependent on structural elements to be constructed after the brickwork, provide proposals for temporary support or bracing for the approval of the Engineer.

## 3.2 FACEWORK

### Cleaning

General: Clean progressively as the work proceeds to remove mortar smears, stains and discolouration.

### Colour mixing

Evenly distribute the colour range of units and prevent colour concentrations and “banding” unless specifically identified as a feature of the brickwork.

## 3.3 DAMP-PROOF COURSES

### Damp-proof courses

Material: Embossed Polythene sheeting. Install sheeting at base of all walls to stop moisture rising up wall structures.

### Location

Provide damp-proof courses as follows:

- Walls built off slabs on ground: In the bottom course of the wall on top of the slab.
- Walls adjoining infill floor slabs: In the course above the slab. Project 40 mm and dress down over the membrane turned up against the wall.

### Installation

Lay in long lengths. Lap full width at angles and intersections and at least 150 mm at joints. Step as necessary, but not exceeding 2 courses per step. Sandwich damp-proof courses between mortar.

## 3.4 CONTROL OF MOVEMENT

### Joints

Provide joints as follows:

- Expansion joints for brickwork:
  - . Maximum length of continuous wall face: 8 m.
  - . Closest joint location to external corner: 2.5m
  - . Maximum vertical spacing: 8 m.
  - . Width of control joint:  $\geq 10 \text{ mm} \leq 20 \text{ mm}$ .
  - . Width of horizontal joint:  $\geq 15 \text{ mm} \leq 20 \text{ mm}$ .

Filler material: Provide compatible sealant and bond breaking backing materials which are non-staining to masonry.

- Bond breaking materials: To be non-adhesive to sealant, or faced with a non-adhering material.
- Foamed materials: To be closed-cell or impregnated, not water-absorbing.

Joint filling:

- Installation: Clean the joints thoroughly and insert an easily compressible backing material before

sealing.

- Sealant depth: Fill the joints with a gun-applied flexible sealant for a depth of at least two-thirds the joint width.

Refer to the BOQ and drawings for details of locations, types and extent of built in components.

## 3.6 STONEMWORK

### 1 GENERAL

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#### 1.1 INSPECTION

##### Notice

Give sufficient notice so that inspection may be made of the following:

- The prepared stone sample range.
- Lintels in position.
- Damp proof courses in position.

#### 1.2 TOLERANCES

##### Dimensions of stone units

Maximum deviation from required dimensions:

- Loadbearing stone in cut blocks:  $\pm 4$  mm.
- Other stone used in foundations or not exposed to view: No size requirement unless noted otherwise in this worksection .

### 2 PRODUCTS

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#### 2.1 NATURAL STONE

##### Stone types

Sandstone defects: Minor shale laminates and minor concentrations of carbonaceous material (tea leaves) are acceptable in visible faces. Neither defect is acceptable in carved or moulded work.

Granite defects: Igneous stone (e.g. granite) obtained from quarry stone extracted in blocks sufficiently large to suit the project requirements, and containing no more than a small degree of microcracking.

##### Stone selection

Grading: Select stone of the designated quality grade.

Matching: Within each grade, select stone for the best match of colour and pattern.

##### Source of stone supply

Ensure the stone quarry or supplier can provide all stone required for the project without the need to find alternative supplies.

#### 2.2 MORTAR

##### Mortar materials

Cement shall conform to the requirements of ASTM specification C-150 Type 1 or similar approved standard for normal Portland cement.

- White cement: Iron salts content  $\leq 1\%$ .
- Off-white cement: Iron salts content  $\leq 2.5\%$ .

Lime: Confirm source of Lime with Engineer to ensure highest quality Lime is used in the mortar. Protect from damage on site and store minimum 300mm above ground in waterproof storage facility.

Sand: Fine aggregate with a low clay content selected for grading, sharp and free from efflorescing salts. River or pit sand should be sharp, angular, hard, clean uncoated particles free from clay and organic impurities.

Water: Water to be used for the mixing of mortar should be clean and free from oil, acid, alkali, salts, organic materials or other substances that are harmful to the mortar mix.

Crushed stone: Fine aggregate consisting partly or wholly of crushed stone, made from material of the same type as the stone facing.

Measurement of volume: Measure binders and sand by volume using buckets or boxes. Do not allow sand to bulk by absorption of water.

### **Mortar**

Standard and ratio of mix for all mortar shall be M-400 (1:3), M-300 (1:4), M-250 (1:5) and M-200 (1:6). Provide minimum water.

### **Mortar mix**

Mortar mixing shall be done in a mechanical mixer unless the Engineer specifically permits hand mixing. If hand-mixing is done, the operation shall be carried out on a clean watertight platform and cement & sand shall be first mixed dry in the required proportion to obtain a uniform color and then the mortar shall be mixed for at least two minutes after addition of water.

Cement Mortar shall be mixed in such quantities as can be used in the work within 30 minutes. Mortar, which has taken initial set, shall not be used, nor shall it be re-mixed with fresh mortar.

Preparing lime putty:

- Using hydrated lime: Add lime to water in a clean container and stir to a thick creamy consistency. Leave undisturbed for at least 16 hours. Remove excess water and protect from drying out.
- Using quicklime: Run to putty as soon as possible after receipt of quicklime. Partly fill clean container with water, add lime to half the height of the water, then stir and hoe ensuring that no lime remains exposed above the water. Continue stirring and hoeing for at least 5 minutes after all reaction has ceased, then sieve into a maturing bin. Leave undisturbed for at least 14 days. Protect from drying out.

Mortar proportions (cement:lime:sand): As defined on the drawings.

Sand stockpile: Ensure sand is dry and stored undercover to avoid errors in volume batching during the mixing process.

## **3 EXECUTION**

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### **3.1 WORKMANSHIP GENERALLY**

#### **Cutting**

Perform the necessary cutting and shaping of stone to designated profiles including weathering, jointing, chasing, forming grooves. Make the bed, face and back joints of the stone square and true where dimensioned stone is required.

#### **Carving and moulding**

Achieve a clean sharp finish. Carry out all work identified on the drawings to the approval of the Engineer.

### **3.2 LAYING UNITS**

#### **Bedding**

Remove dust and foreign material from the bedding surfaces. Water the face of the stone units so that full strength joints are achieved. Where possible, bed and joint the stone in one operation. Lay each stone on a full bed of mortar. Solidly fill and grout vertical joints as the work proceeds. Point up joints around flashings as necessary.

#### **Natural bed**

Lay loadbearing sedimentary stone with its natural bed at 90 degrees to the load, except for the following:

- Cladding panels: In non-loadbearing cladding panels, form each panel with its natural bed at right angles to the face.

#### **Temporary support**

Provide support as necessary to the stone while the mortar is curing, using bracing, joint spacers, or both.

Bracing and joint spacers: Non-damaging and non-staining softwood wedges soaked in water. Do not allow metal pinch bars to bear directly on the stone.

### **Raking and toothing**

Raise advanced work no more than 1.5 m above the general level, and rake back. Do not tooth stonework for subsequent additions except where toothing is shown on the drawings.

### **Bonding**

Bond the masonry so as to provide stability and monolithic structural action to the stonework assembly.

## **3.3 STONE FOUNDATIONS**

### **Stone footings**

Construct the footing course entirely of through stones, and if stepping is necessary, overlap the stepped courses at least 300 mm.

### **Subfloor stone foundation walls**

Minimum foundation wall thicknesses:

- Supporting masonry walls 100 mm thick: 300 mm.
- Supporting masonry walls 250 mm thick: 450 mm.
- Supporting masonry walls 370 mm thick: 600 mm.

Stone sizes:

- Maximum height: 350 mm.
- Minimum height: Generally 175 mm; through stones 300 mm.

Bond pattern: Provide through stones as follows:

- All stones in top and bottom courses.
- Elsewhere as header units.

Slab bearings: Provide continuous bearing at least 100 mm wide to the edge of suspended slabs.

## **3.4 DAMP-PROOF COURSES**

### **Material**

Material: Embossed Polyethylene sheeting. Install sheeting at base of all walls to stop moisture rising up wall structures.

### **Location**

Provide damp-proof courses as follows:

- Walls built off slabs on ground: In the bottom course of the wall on top of the slab.
- Walls adjoining infill floor slabs: In the course above the slab. Project 40 mm and dress down over the membrane turned up against the wall.

### **Installation**

Lay in long lengths. Lap full width at angles and intersections and at least 150 mm at joints. Step as necessary, but not exceeding 2 courses per step. Sandwich damp-proof courses between mortar.

## **3.5 JOINTING AND POINTING**

### **Joints**

Size (mm): Not less than 3mm or more than 5mm for dimensioned stonework. Size may vary for non dimensioned stonework from 10mm to 30mm. Joint size should not exceed this without approval of the Engineer.

Jointing material: Mortar with a strength less than the stonework. Lime putty where identified on drawings for special dimensioned stonework.

Pointing material: Coloured mortar or mortar as above, refer to Schedule or drawings. Lime putty where identified on drawings for special dimensioned stonework.

## **3.6 SEALANT JOINTING**

### **Preparation for jointing**

Immediately before jointing remove loose particles from the joint, using brushes or compressed air.

### **Taping**

Protect the stonework surface on each side of the joint using 50 mm wide masking tape or equivalent means. On completion of pointing remove the tape and remove any stains or marks from the stonework surface.

### **Jointing materials**

Use recommended jointing and pointing materials which are compatible with each other and with the contact surfaces and non staining to finished surfaces.

Priming: Apply the recommended primer to the surfaces in contact with sealant materials.

Sealant colour: Refer to Schedule or drawings.

Foamed materials (in compressible fillers and backing rods): Closed cell or impregnated types which do not absorb water.

### **Sealant application**

Apply the sealant to dry joint surfaces. Do not apply the sealant in unsuitable weather conditions (e.g. when the ambient temperature is outside the range 5 – 50°C) or outside the recommended working time for the material or the primer.

### **Joint finish**

General: Produce a smooth, slightly concave surface using a tool designed for the purpose.

## **3.7 COMPLETION**

### **Cleaning**

Cleaning: Leave the stonework clean on completion.

Refer to the BOQ and drawings for details of locations, types and extent of built in components.

<b>3.7 LIGHT STEELWORK</b>
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## **1 GENERAL**

### **1.1 INSPECTION**

#### **Notice**

Give notice so that inspection may be made of steel framing erected before lining or cladding.

### **1.2 SUBMISSIO**

#### **NS Design**

The Contractor is to confirm that all proposed member sizes are available for the project in accordance with the drawings and BOQ. If selected sizes are not available, seek alternatives and obtain approval from the Engineer.

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## **2 EXECUTION**

### **2.1 CONSTRUCTION GENERALLY**

#### **Fabrication**

Length: Cut members accurately to length so that they fit firmly against abutting members.

Service holes: Form holes by drilling or punching if needed.

- Bushes: Provide plastic bushes or grommets to site cut holes.
- Swarf: Remove swarf and other debris from cold-formed steel framing immediately. Site work: Do not fabricate on site where welded connections are required.

#### **Fastening**

Select from the following:

- Bolting.
- Self-drilling, self-tapping screws.
- Blind rivets.

#### **Welding**



**Burning:** Avoid procedures that result in greater than localised “burning” of the sheets or framing members. Protect other adjoining materials from damage during welding activities.

**Other workers:** Protect other workers on site from welding flash, sparks and other potential injuries during welding activities.

**Prefabricated frames**

Protect frames from damage or distortion during storage, transport and erection.

**Unseasoned timber**

Do not fix in contact with framing without fully painting the timber and/or the steel to avoid future rusting of the steel.

**Earthing**

Permanent earthing: Required.

Temporary earthing: Provide temporary earthing during erection until the permanent earthing is installed.

**Protection**

Coatings which have been damaged by welding or other causes shall be restored. Thoroughly clean affected areas to base metal and coat with zinc rich organic primer.

## **2.2 TRUSSES**

**Fabrication**

Factory assemble trusses and transport to site where possible. Obtain approval from the Engineer if it is required to fabricate trusses on site.

**Marking**

Permanently mark each truss to show:

- Manufacturer.
- Tag or number.
- Location.
- Support points.

**Installation**

Fix to support structures, plumb to within  $H/200$ , where H is the height at the apex.

## **2.3 COMPLETION**

**Cleaning**

On completion of framing remove debris from any gaps between members.

## 3.8 STEELWORK PAINTING

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### 1 GENERAL

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#### 1.1 INSPECTION

##### Notice

Give sufficient notice so that inspection may be made of the following:

- Surfaces after preparation prior to application of first coating.
- Coating after application of final coat.

#### 1.2 SAMPLES

##### Painting and coating colour

Submit a sample of the finished product for each different coating system.

Size of each sample: 200 x 200 mm.

### 2 PRODUCTS

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#### 2.1 GENERAL

##### General

All protective coatings must be handled, stored, mixed and applied strictly in accordance with the manufacturer's instructions and Product Data Sheets.

### 3 EXECUTION

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#### 3.1 PROTECTION

##### Surroundings

Provide protection of the surroundings to the coating works and ensure that no abrasive, overspray or paint waste debris is released either to air, ground or to any watercourse. Repair or clean damage as appropriate.

##### Contamination

Ensure protection of sensitive items during surface preparation and coating works. Do not permit surface preparation debris to contaminate coated surfaces which are not yet dry, nor cause damage to any other services or equipment.

##### Stacking and handling

Do not stack, handle or transport coated items until the coating has sufficiently cured so as to resist handling actions.

Stack and handle all steelwork using fabric slings or padded chains, used in a manner that ensures that no damage is caused to the coating system. Adopt soft packaging, carpet strips or other deformable materials between all steel items. Do not permit steel to steel contact in any situation.

Water ponding: Stack coated items so that water ponding does not or cannot occur whilst the items are in storage, transport or "laydown".

##### Repair of coating damage

If damage occurs repair so as to ensure that the full corrosion protection ability of the system is reinstated.

#### 3.2 SURFACE PREPARATION

##### General

Coatings shall be applied only to properly prepared and cleaned surfaces.

### **Surface preparation**

Ensure all surfaces are free from oil, grease, dirt, bird droppings or any other contaminants, particularly soluble contaminants.

Surface defects: Remove or correct other surface defects, including cracks, laminations, deep pitting, undercutting, weld spatter, slag, burrs, fins and sharp edges.

Remove all weld spatter by grinding or chipping.

### **Priming**

Prime coat all surfaces with zinc rich primer on the same day as the completion of surface preparation works. In every case, the specified surface preparation standard, in both cleanliness and profile, shall be evident at the time that the primer coating is applied.

## **3.3 COATING**

### **APPLICATION General**

Apply the coatings in accordance with the **drawings or manufacturer**

**recommendations.. Final surface preparation or coating application**

Limits: If the following climatic/substrate conditions are present do not apply coating:

- The ambient air temperature is below 5°C or above 40°C.
- The substrate temperature is below 10°C or above 35°C.
- The surface to be coated is wet or damp.

Defects: Apply materials so as to produce an even coating free from film defects.

Detail: Stripe coat all welds, bolt holes, sharp edges and difficult to spray areas by brushing in with the prime coat and intermediate coat material prior to the full coating application.

### **Subsequent coats**

Ensure that before any subsequent coating layer is applied, the surface condition of the preceding coat is complete and correct in all respects, including its cleanliness and freedom from defects.

Correct any defects before the next coating layer is applied.

## **3.9 LIGHT TIMBERWORK**

### **1 GENERAL**

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#### **1.1 INSPECTION**

##### **Notice**

Give sufficient notice so that inspection may be made of the following:

- Timber framing after erection before lining or cladding.
- Roof framing and connection to wall and ceiling structures.

#### **1.2 SUBMISSI**

##### **ONS Design**

The Contractor is to confirm that all proposed member sizes are available for the project in accordance with the drawings and BOQ. If selected sizes are not available, seek alternatives and obtain approval from the Engineer.

### **2 PRODUCTS**

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#### **2.1 TIMBER**

##### **Timber grades**

Structural timbers:

- Appearance grade if exposed to view in the finished work:  
Use best quality timber free from twists, knots, splits and other visual or physical defects.
- Structural grade if concealed in the building:  
Lower quality timber with some visual defects acceptable but with minimal physical defects.

## 2.2 SHEET

### PRODUCTS Structural

#### plywood panels

All structural plywood panels used for construction purposes are to be approved by the Engineer. Refer to drawings and BOQ for details of locations and sizes. All structural plywood is to be tested before use to the satisfaction of the Engineer to ensure that it will be suitable for the proposed use.

Use branded or certified plywood products where possible.

#### Hardboard or fibreboard panels

All hardboard or fibreboard panels used for construction purposes are to be approved by the Engineer. Refer to drawings and BOQ for details of locations and sizes. All material is to be tested before use to the satisfaction of the Engineer to ensure that it will be suitable for the proposed use.

Use branded or certified products where possible.

## 2.3 COMPONE

### NTS Steel post

#### bases

Minimum dimensions:

- Stirrup: 75 mm wide x 6 mm thick.
- Dowel: 20 mm diameter heavy tube.

Location: To timber posts supported off concrete slabs or footings.

Finish: Galvanize after fabrication.

#### Fasteners

Material:

Use best quality steel bolts, washers and nuts for bolted connections. Washers to be used both sides of timber to avoid crushing of the timber at the connection point.

Use best quality screws to avoid damage to screw heads during tightening process.

Use best quality bright steel nails for internal work protected from the weather and galvanised nails for external fixings exposed to the weather.

Lightweight allow bolts and screws will not be permitted.

Installation: Pre drill holes in hardwood timber to avoid splitting the timber.

Do not split or otherwise damage the timber or fastener by hammering bolts or screws into the timber.

## 3 EXECUTION

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### 3.1 GENERAL

#### Protection from weather

General: Provide temporary protection for members until permanent covering is in place.

### 3.2 FLOOR

#### FRAMING Bearers

##### and joists

Levelling: Level bearers and joists by packing for the full width of the member. Joints: Locate joints only over supports:

- Minimum bearing of bearers: 50 mm.
- Minimum bearing of joists: 30 mm.

Fixing: Secure bearers and joists to supports to provide restraint against lateral movement.

Joist restraint: If joist timber is unseasoned, the span  $\geq$  3000 mm, provide solid blocking between each joist in rows at 1800 mm centres and at the ends of the joists over the supports.

Members: Provide bearers and joists where shown on the drawings and in the BOQ.

### **Flooring**

Provide flooring of structural plywood where shown on the drawings and in the BOQ.

## **3.3 ROOF AND CEILING**

### **FRAMING Wall plates**

Fix timber wall plates to top of masonry walls with either straps or bolts, or provide fixings cast into the ring beam as required.

### **Ceiling framing**

Construct timber framed ceilings where shown on drawings with battens fixed to underside of trusses or ceiling joists as required.

### **Additional support**

Provide a frame member behind every joint in fibre cement sheeting or plywood lining to ensure that the lining is fully supported.

### **Roof cladding boards**

Provide roof cladding boards minimum of 20mm thick to full extent of roof structure to support flat metal sheet roofing where shown on drawings. Securely fix to structure and ensure that the top surface is as smooth as possible to avoid damage to the roof sheeting.

## **3.4 TRUS**

### **SES**

#### **Installation**

Support: Support trusses on bottom chord at two points only, unless designed for additional support. Plumb: Within H/200, where H is the height.

Vertical movement: Over internal walls provide at least 10 mm vertical clearance and use bracing methods which allow for vertical movements.

Construction: Construct trusses strictly in accordance with the drawings. If variations are proposed due to construction fabrication or installation issues, obtain approval from the Engineer before changing the design.

## **3.5 COMPLETION**

### **Tightening**

Tighten bolts, screws and other fixings so that joints and anchorages are secure at all times.

### **Clean up**

Remove all shavings, discarded chips and pieces of timber from the structure during construction and clean up all working areas prior to Completion.

## **4.1 WATERPROOFING**

## **1 GENERAL**

### **1.1 INTERPRETATIONS**

#### **Definitions**

For the purposes of this worksection the definitions given below apply.

- Substrates: The surfaces on which membrane systems are laid.
- Bitumen: A viscous material comprising complex hydrocarbons which is soluble in carbon disulphide, softens when it is heated, is waterproof and has good powers of adhesion. It is produced as a refined by-product of oil.
- Bond breakers: Layers which prevent membranes from bonding to the backgrounds.
- Membranes: Impervious barriers to liquid water which may be:
  - . Liquid applied: Membranes applied in liquid or gel form and air cured to form a seamless film.
  - . Sheet applied: Membranes applied in sheet form with joints lapped and bonded.

- Membrane systems: Combinations of membranes, flashings, drainage and accessories which form waterproof barriers and which may be:
  - . Loose-laid.
  - . Bonded to backgrounds fully or partially.

## 1.2 INSPECT

### ION Notice

Give sufficient notice so that inspection may be made as follows:

- Background preparation completed.
- Before membranes are finished, covered up or concealed.

## 2 PRODUCTS

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### 2.1 MEMBRANES

#### Membrane systems

To be proprietary membrane systems where possible having certification from an international testing organisation.

#### Internal roof outlets for membrane roof

Proprietary funnel shaped sump cast into the roof slab, set flush with membrane, with a flat removable grating and provision (e.g. clamp ring) for sealing the membrane into the base of the outlet.

## 3 EXECUTION

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### 3.1 PREPARATION

#### General

Prepare backgrounds as follows:

- Fill all cracks in backgrounds wider than 1.5 mm with a filler compatible with the membrane system.
- Fill voids and hollows in concrete backgrounds with a concrete mix not stronger than the background.
- Remove excessive projections.
- Remove deleterious and loose material.
- Leave the surface free of contaminants, clean and dust free.

#### Moisture content

Concrete backgrounds: Cure for > 21 days.

#### Falls

Verify that falls in backgrounds are > 1:100.

#### Joints and fillets

Internal corners: Provide 45° fillets.

External corners: Round or arris edges.

Movement control joints: Prepare all background joints to suit the membrane system.

#### Priming

If required, prime the backgrounds with compatible primers to ensure adhesion of membrane systems.

### 3.2 APPLICATION

#### ON Protection

Protect membrane from damage during installation.

#### Drains

Prevent moisture from tracking under the membranes at drainage locations.

Drains and cages: Provide grates or cages, to prevent blockage from debris.

Overflows: Turn the membranes into the overflow to prevent moisture from tracking behind the membrane.

### **Sheet joints**

Bituminous sheet membranes:

- Side laps > 50 mm.
- End laps > 100 mm.

Synthetic rubber

membranes:

- Factory–vulcanized laps > 40 mm.
- Field side laps > 50 mm for side laps.
- Field end-laps > 100 mm for end laps.

### **Curing of liquid applied**

**systems** To the manufacturers"

instructions. **Movement control**

### **joints**

Locate over movement control joints in the substructure.

Fillets and bond breakers: Provide of sufficient dimension to allow the membrane to accommodate the movement.

Bonded membranes: Carry movement joints in the substrate through the surface finish.

### **Membrane terminations**

Edge protection: Provide upturns above the maximum water level expected from the exposure conditions of rainfall intensity and wind.

- Minimum height of 200mm for all upturns above membrane level unless noted otherwise on the drawings.
- Anchoring: Secure sheet membranes along the top edge.
- Edge protection: Protect edges of the membrane.
- Waterproofing above terminations: Waterproof the structure above the termination to prevent moisture entry behind the membrane using cappings, waterproof membranes or waterproof coatings.

### **Membrane vertical penetrations**

- Pipes, ducts, and vents: Provide separate sleeves for all pipes, ducts, and vents and have them fixed to the substrate. Minimum height of 200mm for all sleeves above membrane level unless noted otherwise on the drawings.

.

### **Overlaying finishes on membranes**

Compatibility: If a membrane is to be overlayed with another system such as tiles, pavers, ballast, insulation, soil, and the like, provide an overlaying system that is compatible with and not cause damage to the membrane.

Ensure that no damage is caused to the membrane during the laying of the overlay material. If any damage occurs immediately stop work and repair the damage before proceeding with the overlay process.

Bonded or partially bonded systems: If the topping or bedding mortar requires to be bonded to the membrane, provide sufficient movement joints in the topping or bedding mortar to reduce the movement over the membrane.

## 4.2 ROOFING

### 1 GENERAL

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#### 1.1 INSPECTION

##### Notice

Give sufficient notice so that inspection may be made of:

- Roof framing during construction.
- Those parts of the roofing, vapour barrier, insulation and roof plumbing installation which will be covered up or concealed.

#### 1.2 SUBMISSIONS

##### Samples

Submit samples of the following showing the range of variation available:

- Currugated and flat metal roof sheeting
- Roof cappings, flashings, gutters, downpipes

### 2 PRODUCTS

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#### 2.1 MATERIALS AND COMPONENTS

##### Fasteners

Self-drilling screws: Corrosion resistant screws to approval of Engineer.

Nuts and bolts: Corrosion resistant fastenings to approval of Engineer.

Fastenings to timber battens or purlins: Provide fastenings just long enough to penetrate the thickness of the timber without piercing the underside.

#### 2.2 CORRUGATED METAL ROOFING AND CLADDING

##### General

Provide a proprietary system of preformed corrugated sheets and all purpose-made accessories required to complete the installation to roof framing or wall framing. Refer to **detailed drawings** for details.

#### 2.3 FLAT SHEET METAL ROOFING AND CLADDING

##### General

Provide a system of flat metal sheets and all purpose-made accessories required to complete the installation to roof framing or wall framing.

#### 2.4 GLAZED ROOFING AND SKYLIGHTS

##### General

Provide a proprietary overhead glazing system fixed to glazing bars or directly to the roof framing.

Provide all purpose-made accessories required to complete the installation.

#### 2.5 ROOF VENTILATORS

##### General

Provide proprietary roof mounted ventilators and all purpose-made accessories required to complete the installation where shown on the drawings to ventilate the roof space.

Provide fabricated ventilators in walls as shown on the drawings to ventilate the roof space.



### 3 EXECUTION

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#### 3.1 INSTALLATION

##### **Protection**

Keep the roofing and rainwater system free of debris and loose material during construction, and leave them clean and unobstructed on completion. Repair damage to the roofing and rainwater system.

If it is necessary to repair minor damage to metal roofing, do so immediately after the damage has occurred. The Contractor is take care to not damage other surfaces during the repair works.

##### **Thermal movement**

Provide for thermal movement in the roof installation and the structure, including movement in joints and fastenings.

#### 3.2 SHEET METAL ROOFING AND CLADDING

##### **Roofing sheet installation**

Fixings: Provide all fixings required to fix the roof sheeting to the framing so that the entire roof covering is waterproof and secure. All loose edges are to be fixed down to ensure that they cannot get loose in high winds.

Expansion joints: refer to drawings for locations of expansion joints in roofs and details of construction.

##### **Ridges and eaves**

Treat ends of sheets as follows:

- Project sheets 50 mm into gutters.
- Close off ribs of ribbed sheeting at bottom of sheets using mechanical means or with purpose-made end caps.
- Turn pans of ribbed sheeting up at tops and down into gutters by mechanical means.
- Provide pre-cut notched eaves flashings and birdproofing wire mesh where necessary.

##### **Ridge and eaves capping**

Finish off along ridge and side eaves edges with purpose-made ridge capping and eaves cappings.

##### **End laps**

Where end laps are unavoidable in roof sheeting, and the sheet profile is not suitable for interlocking or contact end laps, construct a stepped type lap. Refer to details on drawings as required.

Length of lap (mm): Laps to ends of sheets should not be less than 150mm and sealed with a continuous line of silicone sealant between the sheets of roofing.

##### **Curved corrugated sheet**

Form by rolling from material recommended for curving. Minimise crimping or creasing across the face of the sheet. Trim off crimped or creased edges and ends.

K-Span roofing where identified on the drawings is to be strictly controlled during the installation process to ensure that the completed work is of a high standard.

##### **Cladding sheet installation**

Fixings: Provide all fixings required to fix the wall cladding sheeting to the framing so that the entire wall is waterproof and secure. All loose edges are to be fixed to ensure that they cannot get loose in high winds.

Expansion joints: refer to drawings for locations of expansion joints in walls and details of construction.

Flashings: Flashings are required at the top, sides and bottom of all metal wall cladding to ensure that the wall is waterproof in all weather conditions.

##### **Metal separation**

Prevent direct contact between incompatible metals, and between green hardwood and aluminium or coated steel, by either:

- Applying an anti-corrosion, low moisture transmission coating to contact surfaces.

- Inserting a separation layer.

### **3.3 GLAZED ROOFING AND SKYLIGHTS**

#### **Installation**

Fixing: Fix all glazed roof panels and skylights in accordance with the drawings.

Flashings: Flashings are required at the top, sides and bottom of all glazed roof panels and skylights to ensure that the roof is waterproof in all weather conditions.

### **3.4 ROOF VENTILATORS**

#### **Installation**

Fixing: Fix roof ventilators in accordance with the manufacturers construction details or in accordance with the drawings for fabricated ventilators.

### **3.5 ROOF PLUMBING**

#### **General**

Provide the flashings, cappings, gutters, rainwater heads, outlets and downpipes necessary to complete the roof system.

#### **Jointing sheet metal rainwater goods**

Butt joints: Make joints over a backing strip of the same material.

Soldered joints: Do not solder aluminium or aluminium/zinc-coated steel.

Sealing: Seal fasteners and mechanically fastened joints. Fill the holes of blind rivets with silicone sealant.

#### **Flashings and cappings**

Installation: Flash roof junctions, upstands, abutments and projections through the roof. Preform to required shapes where possible. Cut, notch, bend or dress down as necessary to follow the profile of adjacent surfaces. Lap joints 150 mm in running lengths. Provide matching expansion joints at 6 m maximum intervals.

Upstands: Flash projections above or through the roof with two part flashings, consisting of a base flashing and a cover flashing, with at least 100 mm vertical overlap. Provide for independent movement between the roof and the projection.

Wall abutments: Provide overflashings where roofs abut walls, stepped to the roof slope in brickwork.

- In masonry: Build cover flashing at least 100mm into the wall at least 250mm above the roof level. Provide base flashing on roof and provide at least 100mm vertical overlap.
- In concrete: Turn cover flashing at least 30 mm into sawcut grooves at least 250mm above the roof level, wedge at 200 mm centres with compatible material and render over top of flashing. Provide base flashing on roof and provide at least 100mm vertical overlap.

Fixing to pipes: Solder, or seal with neutral cured silicone rubber and either of the following:

- Secure with a clamping ring.
- Provide a proprietary flexible clamping shoe with attached metal surround flashing.

#### **Gutters**

Prefabricate gutters to the required shape where possible. Form stop ends, bends and returns. Provide overflows to prevent back-flooding.

Gutter and sump support: Provide framing and lining to support valley gutters, box gutters and sumps. Line the whole area under the gutters and sumps.

Support: Steel straps as shown on drawings or as approved by the Engineer.

Lining: Timber boards or plywood as shown on drawings or as approved by the Engineer.

Valley gutters: Profile to suit the valley boarding. Nail or screw to the valley boarding at the top end to prevent the gutter creeping downwards.

Gratings and guards: Provide removable gratings over rainwater heads and sumps:

- Type: Wire mesh cages reinforced with steel bars where required due to size and expected snow loads. Refer to drawings for details.

Expansion joints: Provide expansion joints in guttering longer than 30 m:

- Type: Refer to drawings for details.

#### **Downpipes**

Prefabricate downpipes to the required section and shape where possible. Connect heads to gutter outlets and, if applicable, connect feet to rainwater drains.

Access cover: Provide a removable watertight access cover at the foot of each downpipe stack if the downpipe is connected to rainwater drains.

Downpipe support: Provide supports and fixings for downpipes.

### **3.6 ROOF MOUNTED EQUIPMENT ACCESS**

#### **Walkway**

Product: Provide proprietary walkway system to locations as shown on drawings. Provide fabricated system constructed as shown on drawings. Fabricate in accordance with metalwork section of the specification.

Installation: Install proprietary systems in accordance with manufacturers details and as identified on drawings.

### **3.7 COMPLETION**

#### **Roof Inspection**

The Contractor is to closely inspect the entire roof covering and metal cladding to walls at completion of the works.

Make good any defects or damage to the sheeting, cappings or flashings. Remove all loose metal and other rubbish, spare nails, screws, filings and other debris.

Clean down the roof, gutters, downpipe outlets to ensure that it is good condition ready for occupation.

## **4.3 WINDOWS AND WINDOW HARDWARE**

### **1 GENERAL**

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#### **1.1 INTERPRETATION**

##### **Definitions**

For the purposes of this worksection windows also includes louvres, either vertical or horizontal, set into frames.

#### **1.2 INSPECTION**

##### **Notice**

Give sufficient notice so that inspection may be made of the following:

- Openings prepared to receive windows (where windows are to be installed in prepared openings).
- Fabricated window assemblies delivered to the site, before installation.
- Commencement of window installation.

### **2 PRODUCTS**

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#### **2.1 LOUVRE ASSEMBLIES**

##### **General**

Provide louvre blades mounted in a surround frame and able to withstand the wind pressure for that location without failure or permanent distortion of blades, and without blade flutter.

##### **Adjustable louvres**

Provide louvre blades clipped into holders which pivot, linked together in banks, each bank operated by an operating handle incorporating a latching device, or by a locking bar.

##### **Screens**

Provide metallic coated steel wire mesh screens behind louvres to prevent the entry of birds, rodents and wind blown leaves and papers.

## **2.2 INSECT SCREENS**

### **Aluminium framed**

#### **screens**

Provide insect screens with mesh frame channel. Provide an extended frame section where necessary to adapt to window opening gear.

- Mesh: Fix the mesh into the frame channel with a continuous resilient gasket, so that the mesh is taut and without distortion.

#### **Fixed screens**

Provide fixed screens to the window frames with a clipping device which permits removal for cleaning.

#### **Hinged screens**

Hinge at the side to give access to opening sash.

#### **Sliding screens**

Provide a matching aluminium head guide, sill runner, and frame stile sections for screens not part of the window frame.

- Hardware: Nylon slide runners and finger pull handle.

## **2.3 SECURITY WINDOW**

### **GRILLES General**

Provide security grilles in accordance with the drawings or proprietary metal security grille screens, fixed to the building structure with tamper resistant fastenings.

## **2.4 WINDOW HARDWARE**

### **Hardware**

Provide hardware of sufficient strength and quality to perform its function, appropriate to the intended conditions of use and climate and fabricated with fixed parts firmly joined.

## **3 EXECUTION**

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### **3.1 INSTALLATION**

#### **General**

Install windows so that the frames:

- Are plumb, level and straight within acceptable building tolerances.
- Are fixed or anchored to the building structure to resist the wind loading.
- Will not carry any building loads, including loads caused by structural deflection.
- Allow for thermal movement.

#### **Flashing and weatherings**

Install moulds, sealant and cement pointing as required so that water is prevented from penetrating the building between the window frame and the building structure.

#### **Fixing and fasteners**

Materials: Use materials compatible with the item being fixed and of sufficient strength, size and quality to perform their function.

Concealed fixings: Provide a corrosion resistant finish.

Exposed fixings: Match exposed fixings to the material being fixed.

Support: Provide appropriate back support (for example blocking and backing plates) for hardware fixings.

Window fastener spacing (nominal): 600 mm.

Window fasteners: Conceal fasteners where possible.

Packing: Pack behind fixing points with durable full width packing.

Prepared masonry openings: If fixing timber windows into existing prepared openings with fastenings through the frame face, make the fastener heads finish below the surface and fill the hole for a smooth surface finish.

#### **Joints**

Make accurately fitted tight joints so that neither fasteners nor fixing devices such as pins, screws, adhesives and pressure indentations are visible on exposed surfaces.

**Operation**

Ensure moving parts operate freely and smoothly, without binding or sticking and are lubricated.

**Supply**

Deliver window hardware items, ready for installation, in individual complete sets for each window.

- In a separate dust and moisture proof package labelled for the specific window.
- Including the necessary templates, fixings and fixing instructions.

Refer to the drawings for details of windows and for details of window hardware.

**3.2 COMPLETION****Cleaning**

The Contractor is to clean all frames, glass, hardware at completion. Any damage to frames, or broken glass is to be repaired or replaced to the satisfaction of the Engineer.

**Adjustment**

Leave the hardware properly adjusted with working parts in working order and lubricated where appropriate.

**4.4 DOORS AND DOOR HARDWARE****1 GENERAL**

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**1.1 INTERPRETATION****Definitions**

For the purposes of this worksection the definitions given below apply.

- Door frame: Includes door trims.
- Doorset: An assembly comprising a door or doors and supporting frame, guides and tracks including the hardware and accessories necessary for operation.
  - . Fire-doorset: A doorset which retains its strength and limits the spread of fire.
  - . Smoke-doorset: A doorset which restricts the movement of smoke.
- Flush door: A door leaf having two flat faces which entirely cover and conceal its structure. It includes doors with cellular and particleboard cores.
- Joinery door: A door leaf having stiles and rails, framed together. A joinery door may also incorporate glazed panels.
  - . Louvred door: A joinery door in which the panel spaces are filled in with louvre blades.

**1.2 INSPECTION****Notice**

Give sufficient notice so that inspection may be made of the following:

- Door frames standing in place before building in to brickwork.
- Door frames installed before fixing trim.

**1.3 SUBMISSION****S Samples**

Submit samples of all hardware items for approval by the Engineer before use in the works.

**Subcontractors**

Automatic sliding door assemblies: Submit names and contact details of proposed supplier and installer.

**Product warranties**

Automatic sliding door assemblies: Submit a warranty from the supplier and installer for the system and its installation, for a period of at least twelve months from the date of completion.

Hardware: Submit the warranties offered by the manufacturer for the hardware items provided in the works.

**Keys**

Key codes: Submit the lock manufacturer's record of the key coding system showing each lock type, number and type of key supplied, key number for re-ordering, and name of supplier.

Keys: For locks keyed to differ and locks keyed alike, verify quantities against key records, and deliver all keys and records to the Engineer at completion.

## **2 PRODUCTS**

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### **2.1 FRAMES**

#### **Aluminium frames**

To be assembled from aluminium sections, including necessary accessories such as buffers, strike plates, fixing ties or brackets, and suitable for fixing specified hardware.

#### **Timber frames**

To be constructed with best quality timber. Obtain approval from the Engineer for the timber selection before use. Construct as shown on the drawings and ensure that all joints are securely made to avoid distortion of the frame in use.

#### **Steel frames**

To be folded from metallic-coated steel sheet sections, joints to be continuously welded, including necessary accessories such as buffers, strike plates, spreaders, fixing ties or brackets, and suitable for fixing specified hardware.

Finish: Grind the welds smooth, prepare and paint the welded joints with primer. Then prime the entire frame.

Hardware and accessories: Provide for fixing hardware including hinges and closers, using 4 mm backplates inside the frame. Screw fix the hinges into the back plates.

Base metal thickness:

- General:  $\geq 1.1$  mm.
- Fire rated doorsets:  $\geq 1.4$  mm.
- Security doorsets:  $\geq 1.6$  mm.

### **2.2 DOORS**

#### **Flush doors**

Cellular core flush doors:

- Provide a subframe of 25 mm minimum width timber around openings for louvres and glazing.
- Provide additional material to take hardware and fastenings.
- Cut outs: If openings are required in flush doors (e.g. for louvres or glazing) make the cut outs not closer than 120 mm to the edges of the doors.

Solid core flush doors:

- Core of timber strips laid edge to edge, fully glued to each other and to facings each side of no less than two sheets of timber veneer.
- Single thickness of moisture resistant general purpose particleboard.

Refer to drawings for details.

#### **Joinery doors**

Fabricate joinery doors as shown on the drawings.

#### **Construction**

Form rebates to suit standard rebated door hardware.

Louvre grilles: Construct by inserting the louvre blades into a louvre frame, and fix the frame into the door.

#### **Double doors**

Provide rebated meeting stiles unless the doors open in both directions. Chamfer square edged doors to prevent binding between the leaves.

### **2.3 DOORSETS**

#### **Automatic sliding door assemblies**

Provide auto sliding door assemblies in accordance with the **drawings**.

#### **Toughened glass door assemblies**

Provide toughened glass door assemblies with matching concealed hinges and patch fittings as appropriate. Ensure that all glass edges are protected during installation and polish on completion.

**Fire-resistant doorsets**

Provide fire resistant doors and frames as matched sets for door openings required to have a fire rating.

Provide copies of test certificates from recognised authorities proving the performance of the doorsets.

**Smoke-resistant doorsets**

Provide smoke resistant doors and frames as matched sets for door openings required to have a smoke stopping capability.

Provide copies of test certificates from recognised authorities proving the performance of the doorsets or seals to frames.

**Security screen doorsets**

Provide security screen doorsets in accordance with the **drawings**.

**2.4 ANCILLARY MATERIALS**
**Nylon brush seals**

To be dense nylon bristles locked into galvanized steel strips and fixed in a groove in the edge of the door or in purpose-made anodised aluminium holders fixed to the door

**Pile weather strips**

To be polypropylene or equivalent pile and backing, low friction silicone treated, ultra-violet stabilised.

**Door Seals**

To be proprietary items as identified in drawings and to approval of Engineer.

**2.5 HINGES**
**Butt hinge sizes**

Refer to **Hinge table A** and **Hinge table B** in which length (l) is the dimension along the knuckles, and width (w) is the dimension across both hinge leaves when opened flat.

- Steel, stainless steel, brass, bronze butt hinges for timber doors in timber or steel frames: To **Hinge table A**.
- Aluminium hinges for aluminium doors, or for doors of other materials in aluminium frames: To **Hinge table B**.

**Hinge materials**

Aluminium hinges: High tensile aluminium with fixed stainless steel pins in nylon bushes, and with nylon washers to each knuckle joint.

Doors fitted with closers: Provide low friction bearing hinges.

**Hinge pins**

Exterior or security doors opening out: Provide fixed pin hinges.

**Hinge table A**

Nominal hinge size l x w x t (mm)	Door leaves not exceeding any of the following		
	Mass (kg)	Width (mm)	Thickness (mm)
70 x 50 x 1.6	16	620	30
85 x 60 x 1.6	20	820	35
100 x 75 x 1.6	30	920	40
100 x 75 x 2.5	50	920	50
100 x 75 x 3.2	70	1020	50
125 x 100 x 3.2	80	1220	50

**Hinge table B**

Nominal hinge size l x w x t (mm)	Door leaf not exceeding mass (kg)	Minimum construction	
		Knuckles	Screws/hinge leaf

100 x 70 x 3	30	3	3
100 x 80 x 3.5	50	5	4



**Number of hinges**

Provide 3 hinges for doors up to 2200 mm high, and 4 for door leaves between 2200 mm and 3000 mm high.

**Wide throw**

If necessary, provide wide throw hinges to stop doors binding on obstacles such as nibs or deep reveals.

**2.6 DOOR HANGING SYSTEMS**

**General**

Provide sliding door tracks in conformance with the drawings.

**2.7 LOCKS AND LATCHES**

**General Door Hardware**

Provide hardware of sufficient strength and quality to perform its function, appropriate to the intended conditions of use and climate and fabricated with fixed parts firmly joined.

**Bolts**

Provide bolts including barrel bolts and tower bolts with associated hardware, including lock plates, ferrules or floor sockets.

**Furniture**

Provide lock and latch furniture suitable for use with the lock or latch to which it is installed with the corresponding level of performance.

**Strike plates**

Use strike plates provided with the locks or latches.

**Fire rated door closers**

Provide closers tested and certified for use as components of fire door assemblies.

**Door Controllers Performance**

Provide door controllers, including door closers, floor or head spring pivots which are suitable for the door type, size, weight and swings required and the operating conditions, including wind pressure.

**3 EXECUTION**

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**3.1 FRAMES**

**General**

Install doors so that the frames:

- Are plumb, level and straight within acceptable building tolerances.
- Are fixed or anchored to the building structure to resist the wind loading.
- Will not carry any building loads, including loads caused by structural deflection.
- Allow for thermal movement.

**Flashing and weatherings**

Install moulds, sealant and cement pointing as required so that water is prevented from penetrating the building between the door frame and the building structure.

**Aluminium frames**

Building in to masonry: Screw galvanized steel brackets twice to jambs and build in.

Fixing to masonry openings: Use proprietary expansion anchors and screw through jambs at each fixing.

**Frame fixing**

Brackets: Metallic-coated steel:

- Width:  $\geq 25$  mm.
- Thickness:  $\geq 1.5$  mm.

Jamb fixing centres:  $\leq 600$  mm.

### **Fixing and fasteners**

Materials: Use materials compatible with the item being fixed and of sufficient strength, size and quality to perform their function.

Concealed fixings: Provide a corrosion resistant finish.

Exposed fixings: Match exposed fixings to the material being fixed.

Support: Provide appropriate back support (for example blocking and backing plates) for hardware fixings.

Packing: Pack behind fixing points with durable full width packing.

Prepared masonry openings: If fixing timber door frames into existing prepared openings with fastenings through the frame face, make the fastener heads finish below the surface and fill the hole for a smooth surface finish.

### **Joints**

Make accurately fitted tight joints so that neither fasteners nor fixing devices such as pins, screws, adhesives and pressure indentations are visible on exposed surfaces.

### **Operation**

Ensure moving parts operate freely and smoothly, without binding or sticking and are lubricated.

### **Supply**

Deliver door hardware items, ready for installation, in individual complete sets for each door.

- In a separate dust and moisture proof package labelled for the specific door.
- Including the necessary templates, fixings and fixing instructions.

## **3.2 COMPLETION**

### **Cleaning**

The Contractor is to clean all frames, doors, glass, hardware at completion. Any damage to frames and doors, or broken glass is to be repaired or replaced to the satisfaction of the Engineer.

### **Adjustment**

Leave the hardware properly adjusted with working parts in working order and lubricated where appropriate.

<b>4.5 GLAZING</b>
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## **1 GENERAL**

### **1.1 INSPECTION**

#### **Notice**

Inspection: Give sufficient notice so that inspection may be made of the following:

- Glass products before they are installed.

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## **2 PRODUCTS**

### **2.1 GLASS**

#### **Glass and glazing materials**

Glass and glazing materials generally: Free from defects which detract from appearance or interfere with performance under normal conditions of use.

Glazing plastics: Free from surface abrasions, and warranted by the manufacturer for 10 years against yellowing or other colour change, loss of strength and impact resistance, and general deterioration.

### **2.2 GLAZING**

#### **MATERIALS General**

Glazing materials (including putty, glazing compounds, sealants, gaskets, glazing tapes, spacers, setting blocks): Appropriate for the conditions of application and the required performance.

#### **Jointing materials**

Provide recommended jointing and pointing materials which are compatible with each other and with the contact surfaces and non staining to finished surfaces. Do not provide bituminous materials on

absorbent surfaces.

**Pile weather strips**

Materials: Polypropylene or equivalent pile and backing, low friction silicone treated, ultra violet stabilised.

Finned type: A pile weather seal with a central polypropylene fin bonded into the centre of the backing rod and raised above the pile level.

**Extruded gaskets and seals**

Type: Non cellular (solid) seals to exclude water from glass/frame junctions. Material:

- Rubber products to be neoprene, ethylene propylene diene monomer (EPDM) or silicone rubber.
- Flexible polyvinyl chloride (PVC)

**Priming**

Apply the recommended primer to the surfaces in contact with sealant materials.

**Movement joints**

Depth of elastomeric sealant: One half the joint width, or 6 mm, whichever is the greater.

Foamed materials (in compressible fillers and backing rods): Closed-cell or impregnated types which do not absorb water.

Bond breaking: Provide backing rods, and other back-up materials for sealants, which do not adhere to the sealant.

**2.3 MIRRORS**

**Reflective**

**surface**

Type: Silver layer deposited on the glass or glazing plastic.

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**3 EXECUTION**

**3.1 GLASS PROCESSING**

**General**

Perform required processes on glass, including cutting, obscuring, silvering and bending. Form necessary holes, including for fixings, equipment, access holes and speaking holes. Process exposed glass edges to a finish that will reduce the risk of injury.

**3.2 INSTALLATIO**

**N General**

Install the glass so that:

- Each piece is held firmly in place by permanent means which enable it to withstand the normal loadings and ambient conditions at its location without distortion or damage to glass and glazing materials.
- Building movements are not transferred to the glass.
- External glazing is watertight and airtight.

Toughened glass: Do not cut, work, or permanently mark after toughening. Use installation methods which prevent the glass making direct contact with metals or other non-resilient materials.

Frameless installations: Join the vertical edges of adjacent glass panels with silicone jointing compound.

External timber framed glazing: Glaze with putty. Do not dry bead into timber frames.

**3.3 FIXING**

**MIRRORS Screw**

**fixing**

Direct to wall plugs with dome-headed chromium-plated screws in each corner and at 900 mm maximum centres around perimeter. Provide polyethylene sleeves and washers to prevent contact between screw and glass. Do not over-tension the screws.

### **Frame fixing**

Proprietary aluminium frames to mirror perimeter, corners mitred. Attach the frame to the wall with concealed screw fixings. Frames and finish to approval of the Engineer.

### **Bead fixing**

Rebated timber beads to mirror perimeter, corners mitred. Screw fix the beads to the substrate.

## **3.4 GLAZED SHOWER**

### **SCREENS Type**

Proprietary system comprising frames of extruded aluminium, stainless steel, or PVC, assembled around safety glass to form fixed panels and sliding, hinged or pivoted doors.

### **Water shedding**

Provide an assembly which sheds water to the inside without retaining it on the frame surfaces. Seal the edge of the frame to adjoining surfaces with a resilient strip.

### **Sliding assemblies**

Hanging: Hang the sliding sash on stainless steel or nylon sheaves on overhead channel track formed in the frame head, and fit nylon or equivalent bottom guides.

Hardware: Pull handles on both sides of sash, or of leading sash in multiple sash arrangements.

## **3.5 COMPLETION**

### **N Cleaning**

Replace damaged glass and leave the work clean, polished, free from defects, and in good condition.

## **4.7 INSULATION AND VAPOUR BARRIERS**

## **1 GENERAL**

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### **1.1 INTERPRETATION**

#### **Definitions**

General: For the purposes of this worksection the definitions given below apply.

- Sarking-type material: Flexible reflective foil membrane material normally used for waterproofing, vapour proofing or thermal reflectance.
- Mineral wool (including glasswool and rockwool): Entangled mat of fibrous non-crystalline material derived from inorganic oxides or minerals, rock, slag or glass, processed at high temperatures from a molten state.
- Vapour barrier: A material or system that adequately impedes the transmission of water vapour.

### **1.2 INSPECTION**

#### **N Notice**

Give sufficient notice so that inspection may be made of the insulation to roof space in areas which will be covered up or concealed.

## **2 PRODUCTS**

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### **2.1 MATERIALS AND COMPONENTS**

#### **Bulk insulation**

Mineral wool blankets and cut pieces: Provided in bulk rolls for laying over roof structures or on roof slabs and batts to suit ceiling member spacing.

Polystyrene (extruded rigid cellular sheets): Provided in modular panels for fixing to walls and roof slabs.

Reflective insulation: Provided in bulk foil rolls for laying over roof structures and foil batts to suit ceiling member spacing.

#### **Sarking-type material**

Sarking: Reflective foil fixed as a membrane to reduce liquid water transfer in walls or roof structures but allow water vapour to move through the building envelope.

Vapour barrier: Reflective foil sealed as a membrane to stop all liquid water and water vapour

transfer.

**Fasteners and supports**

Metallic-coated steel.

### 3 EXECUTION

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#### 3.1 GENERAL

**Bulk insulation**

Batts: Fit tightly between framing members. If support is not otherwise provided, fix over wire mesh stapled to the framing and stretch tight.

**Reflective foil laminate**

To timber: Metallic-coated flat head nails or staples at 300 mm maximum centres.

To steel or aluminium: Double sided pressure sensitive tape.

Overlap (minimum): 150 mm and adhesive fix.

**Roof sarking locations**

Location: Provide sarking under metal sheet roofs. Fix over timber supports and run rolls across roof plane. Overlap each layer of foil so that any water will run down the slope and discharge into the gutter without dripping into the roof space.

#### 3.2 ROOF INSULATION

**General**

Location: The whole of the ceiling area, except the following:

- Eaves, overhangs, rooflights, vents and openings.
- Roofs to outbuildings, garages, and semi-enclosed spaces such as verandahs, porches.

**Installation**

Refer to the drawings for details of insulation requirements for the works.

<b>5.1 LINING</b>
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### 1 GENERAL

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#### 1.1 INSPECTION

**Notice**

Inspection: Give sufficient notice so that inspection may be made of the wall face or framing before installation of linings.

#### 1.2 SUBMISSIO

**NS Samples**

Plasterboard: Submit two 300x300mm samples of each type.

Fibre cement sheet: Submit two 300x300mm samples of each type.

Accessories: Submit samples of accessories, fasteners, trims and cornices.

#### 1.3 TOLERANCES

**Surface**

Flatness, twist and bow:  $\leq 3.0$  mm deviation from a 1.5 m straightedge placed in any position.

### 2 PRODUCTS

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#### 2.1 MATERIALS AND COMPONENTS

**Plasterboard**

Plasterboard sheet lining to be best quality imported sheet material, size, type and thickness in

accordance with the drawings, to the approval of the Engineer.

#### **Fibre cement**

Fibre cement sheet lining to be best quality imported sheet material, size, type and thickness in accordance with the drawings, to the approval of the Engineer.

#### **Fasteners**

Steel nails: Hot dip galvanized.

Screws: Coated steel cross head screws.

#### **Adhesives**

For plasterboard: Epoxy grout adhesive as supplied by the plasterboard sheet manufacturers. For cement sheet: Mastic adhesive.

#### **Sealants**

Fire rated sealant: Non-hardening sealant compatible with the materials to be sealed and having a fire rating equal to that of the partition it seals.

Acoustic sealant: Non-hardening sealant compatible with the materials to be sealed and having a specific gravity of not less than 1.5 gm/cubic centimetre and of 100% polyurethane mastic.

### **3 EXECUTION**

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#### **3.1 CONSTRUCTION GENERALLY**

##### **Conditions**

Do not commence lining work until such time as the building or zone in question is enclosed and weathertight and all wet trades have been completed.

##### **Substrates or framing**

Before fixing linings check and, if necessary, adjust the alignment of wall faces or framing. Make good any damaged areas that may affect the fixing of the lining. Ensure that there are no projections from the face of the wall structure that may affect the installation of the lining material.

##### **Ceiling linings**

Do not install ceilings until at least 14 days after the timber roof structure is fully loaded where this is used for support of the ceiling.

##### **Accessories and trim**

Provide accessories and trim necessary to complete the installation.

##### **Adhesives**

Provide adhesives of types appropriate to their purpose, and apply them so that they transmit the loads imposed, without causing discolouration of finished surfaces.

#### **3.2 PLASTERBOARD LINING**

##### **Supports**

Install timber battens or galvanized steel channels as follows:

- Where framing member spacing exceeds the recommended spacing.
- Where direct fixing of the plasterboard is not possible due to the arrangement or alignment of the framing or wall face.

##### **Installation**

Gypsum plasterboard: Install strictly in accordance with manufacturers recommendations.

Framed construction: Screw or nail or combine with adhesive.

Masonry construction: Fix using adhesive direct to masonry.

Suspended ceilings: Fix using screw or screw and adhesive to ceiling members.

To steel channels: Fix using screw or screw and adhesive.

##### **Multiple sheet layers**

Application: Fire rated and acoustic rated walls.

Joints: Fill and flush up all joints and fixings in each layer and caulk up perimeters and penetrations before commencing succeeding layers. Stagger all sheet joints by minimum 200 mm.

##### **Joints**

Flush joints: Provide recessed edge sheets and finish flush using perforated paper reinforcing tape.

Butt joints: Make joints over framing members or otherwise provide back blocking.

External corner joints: Make joints over metallic-coated steel corner beads.

Control joints: Install purpose-made metallic-coated control joint beads at not more than 12 m centres in walls and ceilings and to coincide with structural movement joints.

### **3.3 FIBRE CEMENT LINING**

#### **Supports**

Install timber battens or galvanized steel channels as follows:

- Where framing member spacing exceeds the recommended spacing.
- Where direct fixing of the fibre cement is not possible due to the arrangement or alignment of the framing or substrate.

#### **Installation**

Run sheets across the framing members. In flush jointed applications, stagger end joints in a brick pattern and locate them on framing members, away from the corners of large openings. Provide supports at edges and joints.

Timber framed construction: Nail only or combined with adhesive.

Steel framed construction: Screw only or combined with adhesive.

Masonry construction: Fix using adhesive direct to masonry.

Suspended flush ceilings: Fix using screw or screw and adhesive to ceiling members or support frame.

Ceilings and soffits: Provide battens where fixing to underside of rafters, roof trusses and purlins.

#### **Multiple sheet layers**

Application: Fire rated and acoustic rated walls.

Joints: Fill and flush up all joints and fixings in each layer and caulk up perimeters and penetrations before commencing succeeding layers. Stagger all sheet joints by minimum 200 mm.

#### **Joints**

Flush joints: Provide recessed edge sheets and finish flush using perforated paper reinforcing tape.

- Movement joints in walls: Position a stud parallel to the joint on each side.
- Movement joints in ceilings and soffits: Provide movement joints to divide ceilings into bays not larger than 10.8 x 7.2 m and soffit linings into bays not larger than 4.2 x 4.2 m or 5.4 x 3.6 m.  
Provide framing parallel to the joint on each side. Do not fix the lining to abutting building surfaces.

External corner joints: Make joints over metallic-coated steel corner beads.

Control joints: Provide purpose-made metallic-coated control joint beads at  $\leq 7.2$  m centres in walls and ceilings and to coincide with structural movement joints.

### **3.4 CEILING ACCESS**

#### **General**

Location: Provide personnel access ways to each separate ceiling space.

Size (mm): Minimum of 600 x 600 mm

Material: Match adjacent ceiling lining.

Type: Plain cover supported on all sides by timber trim fixed to underside of ceiling.

### **3.5 CORNICES**

#### **General**

Plasterboard cornice: Install plasterboard trims to the junctions between wall surfaces and ceilings as shown on the drawings.

Timber cornices: Install timber trims to the junctions between wall surfaces and ceilings as shown on the drawings.

### **3.6 COMPLETION**

#### **General**

Ensure that all surfaces are protected, dry and free from damage until paint finishes are to be applied. All plasterboard and fibre cement surfaces must dry for at least 7 days before painting is to commence.

## 5.2 PARTITIONS – SYSTEMS

### 1 GENERAL

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#### 1.1 INTERPRETATION

##### Definitions

For the purposes of this worksection the definitions given below apply.

- Partition – fully demountable: A partition system in which any component may be demounted without damage, using only small hand tools, and subsequently reassembled without cutting, trimming or refinishing.
- Partition – semi demountable: A partition system in which the major components are designed to be removed and reused but panels or linings, which are likely to be damaged during removal, are not.
- Partition – non demountable: A partition system in which major components, such as panels or linings, are likely to be damaged during removal and may require cutting, trimming or structural repair before reuse.
- Cool room panel system: A partition system fabricated to suit specific thermal conditions in which the insulated panels are designed to be removed and reused but panels or trims are likely to be damaged during removal.

#### 1.2 INSPECTION

##### Notice

Give sufficient notice so that inspection may be made of the following stages:

- Installation of framing / fixings before they are enclosed.

#### 1.3 SUBMISSIONS

##### Samples

Submit samples as follows:

- A sample, at least 300 x 300mm, of each panel type.
- Floor and ceiling fixings and adjustments.
- Samples at least 100 mm long of each structural section, including posts, sills, transoms, door frames, ceiling channels and metal channel headrails, and each moulding, cover strip and bead.
- Skirting, skirting duct, skirting duct stop ends, returns and removable covers.

#### 1.4 TOLERANCES

##### General

Deviation (from true grid lines and planes): up to 3 mm maximum in a 1500mm length.

Misalignment (of adjoining surfaces at grid junctions): 3 mm maximum.

Flatness, twist and bow: Maximum 3 mm deviation from a 1500mm straightedge placed in any position.

### 2 PRODUCTS

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#### 2.1 PARTITIONS

##### General

Provide proprietary non-load-bearing partition wall framing and lining comprising cold formed steel or extruded aluminium members, or both, in conformance with the **drawings**.

##### Building movements

Provide clearances or movement joints so that partitions are not damaged by structural building movements such as long term slab deflection. Where fire resistance or acoustic properties are



specified provide a resilient foam or mastic seal having properties equal to those required for the partition.

**Control joints**

General: Provide for control joints in sheet finishes where required by the structural frame.

**3 EXECUTION**

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**3.1 PREPARATION****General**

Prepare the base to receive the partitions. Ensure that all surfaces are flat without lumps or hollows that could affect the performance of the partition system.

**Set out**

Set out the partitions so that the partition grid, as expressed in panel joints and centrelines of frame members, coincides with the ceiling grid and the building grid, if applicable.

**3.2 ERECTION****Partition erection**

Install the partitions so they:

- Are plumb, level, on their correct alignments, and firmly fixed.
- Have adequate top support by fixing the top plate to the ceiling structure or slab soffit, or are stabilised by lapping and fastening intersecting or butting plates together.
- Have bottom plates fixed at 600 mm maximum centres generally, and 100 mm maximum from ends.

Install coolroom panel systems to manufacturers recommendations and standard details where feasible. Ensure that all seal strips, cover strips, accessories, fixings needed to satisfactorily carry out the installation are provided and installed to the approval of the Engineer.

**Fixing**

Conceal fixings. For demountable items provide fixings capable of being repeatedly removed and replaced without damage to finishes.

Fixing to masonry: Provide masonry anchors of expansion or chemical grout type. Do not provide explosive-driven fastenings.

Fixing to suspended ceilings: Provide adequate top support to the partition without damage to the ceiling components.

**Protection**

Protect existing work from damage during the installation and make good any damage. Provide temporary coverings if necessary.

**Sound properties**

Preserve the sound reduction properties of partitions by sealing flanking sound transmission paths during installation, including junctions between partitions and other building surfaces, air gaps around doorsets, recesses, such as pelmets and blind boxes and cut-outs for services. Avoid cut-outs next to or back-to-back with each other.

Sealing methods: Use appropriate sealing methods, such as durable resilient gaskets or closed cell foam strips. Provide solid resilient materials in preference to foamed materials whenever possible.

**Support**

Provide additional support in the form of framing for fixing hardware, fixtures and fittings.

**3.3 SERVICES****Services access**

Conceal associated building services, either within cavities in the partition structure, or within ducted skirtings supplied as part of the partition system, or both. Provide removable or demountable components of the partition system, for access to services concealed within partition cavities.

## 5.3 ROOM DIVIDERS

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### 1 GENERAL

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#### 1.1 INSPECTION

##### Notice

Give sufficient notice so that inspection may be made of the following:

- Overhead tracks installed before dividers/door panels are hung and ceiling installed.

#### 1.2 SUBMISSIONS

##### Samples

Submit 2 samples of each of the following where applicable:

- Sections proposed to be used for frames, louvres and slats.
- Colour range samples of facings and prefinished production material.
- Manufacturer's standard door furniture items.

#### 1.3 TOLERANCES

##### Tolerances

Deviation (from true grid lines and planes): up to 3 mm maximum in a 1500mm length.

Misalignment (of adjoining surfaces at grid junctions): 3 mm maximum.

Flatness, twist and bow: Maximum 3 mm deviation from a 1500mm straightedge placed in any position.

### 2 EXECUTION

---

#### 2.1 COMPLETION

##### Maintenance manual

Submit manufacturer's published recommendations for service use.

##### Cleaning

Temporary coating: On or before completion of the works, or before joining up to other surfaces, remove all traces of temporary coatings used as a means of protection.

### 3 SELECTIONS

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Refer to the **drawings** for details of room dividers for the works.

## 5.4 SUSPENDED CEILINGS

### 1 GENERAL

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#### 1.1 INSPECTION

##### Notice

Give sufficient notice so that inspection may be made of the framing preparation and setout of suspended ceilings before installation of panels.

#### 1.2 SUBMISSIONS

##### Samples

Submit samples as follows:

- Ceiling material: Sheet, panel, tile, with insulation
- Methods: Methods of jointing, fixing, height adjustment.
- Suspension: Sections proposed for suspension system, including wall angles and trim.

### 2 PRODUCTS

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#### 2.1 LININGS

##### Fibrous plaster tiles

Best quality imported fibrous plaster tiles with hard cast plaster face for decorative ceiling sections.

##### Plasterboard panels

Best quality imported glass fibre reinforced gypsum plasterboard panels or tiles.

### 3 EXECUTION

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#### 3.1 INSTALLATION

##### Ceiling grid

Set out the ceiling grid so that panel joints and centrelines of visible suspension members coincide with grid lines shown on the drawings. If not otherwise shown, set out so that opposite margins are equal.

Pattern and texture: Set out patterned or heavily textured materials to give consistency in direction of pattern or texture.

Special sized panels: Provide special sized purpose-made panels to fill non-standard margins, openings and penetrations.

##### Cut tile edges

General: Conceal, or finish to match prefinished edges.

##### Lighting

Fit lights within the ceiling grid system to ensure that distortion, overloading or excessive vertical deflection is prevented. Support lights on the ceiling primary grid members.

##### Proprietary systems

Provide suspended ceilings as complete proprietary systems, each fabricated by one manufacturer and installed by a specialist installer of demonstrated capacity.

##### Protection

Protect existing work from damage during the installation.

##### Stability

Install the ceilings level; and fix so that under normal conditions there is no looseness or rattling of ceiling components.

## **3.2 SUPPORTS**

### **Bracing**

General: Provide bracing to prevent lateral movement and to resist any imposed horizontal seismic force.

### **External suspended ceilings**

Support external suspended ceilings on rigid members capable of carrying the imposed loads. Install members to minimise any eccentricity, and ensure that the upward and downward wind loads are carried through to the supporting structure.

### **Movement joints**

Install the ceiling with control joints to correspond in location and direction to those in the structural frame.

### **Finishes**

Repair damaged finishes by replacement or refinishing of the item. All repairs are to be completed so no sign of the damage is visible in the completed work.

### **Support members**

Grid members: If required, notch grid members at the junction with the perimeter trim to ensure the panels lie flat on the perimeter trim.

Services: Do not suspend from services (e.g. pipework or ductwork) unless the service has been designed to accept the ceiling load. In locations where services obstruct the ceiling supports, provide bridging and suspension on each side of the services.

Spacing: Space the support members as required by the loads on the system and the type of ceiling, and allow for the installation of services and accessories, including ductwork, light fittings and diffusers. Provide additional support or suspension members for the fixing of such items.

### **Suspension system**

Height adjustment: Provide height adjustment by means of a length adjustment device at each suspension point, permitting length variation of at least 50 mm.

## **3.3 PANELS**

### **General**

Fitting: Fit panels accurately and neatly, free from air leakage and staining.

Panel lock clips: If panels are exposed to wind loads or if required for security, insert locking clips at the junction of rails and panels.

### **Accessories and trim**

Provide accessories and trim necessary to complete the installation.

Plasterboard trim: Provide purpose-made corner beads, casing beads and stop beads.

Metal Trim: Provide trims at junctions with other building elements and surfaces, such as walls, beams and penetrations, consistent with the style, materials and finishes of the ceiling system generally.

### **Service penetrations**

Provide openings for, and fit the ceiling system up to, all services elements such as light fittings, ventilation outlets, detectors, sprinklers and loudspeakers.

## **3.4 ACCESS PANELS**

### **Finish**

Match the ceiling panels in appearance and performance and mark the panel for easy identification.

## **3.5 COMPLETION**

### **Spares**

Supply spare matching tiles and accessories of each type for future replacement purposes. Store the spare materials on site where directed.

## 5.5 JOINERY

### 1 GENERAL

#### 1.1 TOLERANCES

##### Responsibilities

Fabricate and install joinery items. Items to be undamaged, plumb, level, straight and free of distortion and to the **Tolerances table**.

##### Tolerances table

Property	Tolerance criteria
Plumb and level	2 mm in 800 mm
Offsets in flush adjoining surfaces	< 1 mm
Alignment of adjoining doors	< 1.5 mm

#### 1.2 INSPECTION

##### Notice

Give sufficient notice so that inspection may be made of the following:

- Shop fabricated or assembled items ready for delivery to the site.
- Site erected assemblies on completion of erection.

#### 1.3 SUBMISSIONS

##### Samples

Submit samples to the **Sample table** for approval by the Engineer.

##### Sample table

Description	No. of samples
Each type of board to be used complete with finish and edge stripping	2
Typical item of hardware indicating each finish	2
Stone benchtop indicating range of colours	2
Timber balustrade section	1
The finish to all stainless steel items	2
Complete timber bench cupboard door, including hardware	1
Complete drawer front, including hardware	1

### 2 PRODUCTS

#### 2.1 JOINERY MATERIALS AND COMPONENTS

##### Joinery timber

Best quality Russian joinery timber to approval of the Engineer.

##### Plywood

Best quality imported plywood to approval of the Engineer.

##### Decorative overlays

Timber veneer or laminate to approval of the Engineer.

Thickness (minimum):

- For horizontal surfaces fixed to a continuous background: 1.2 mm minimum.
- For vertical surfaces fixed to a continuous background: 0.8 mm.
- For edge strips: 0.8 mm.

### **Stone facings**

Provide stone slabs to benchtops within the visual range of the approved samples.

### **Timber veneers**

Provide veneers falling within the visual range of the approved samples.

## **2.2 JOINERY ITEMS**

### **General**

Provide materials noted on drawings as follows:

- Joinery components and their location, indicative construction details, trims, materials, dimensions and thicknesses, and finishes shall be as detailed.
- All dimensions noted on drawings shall be confirmed on site before construction of the joinery.

## **2.3 KITCHEN ASSEMBLIES**

### **Plinths**

Material: Construct from exterior grade general purpose plywood unless already in place as a concrete plinth.

Thickness: 16 mm.

Fabrication: Form up with front and back members and full height cross members at not more than 900 mm centres.

Finish: Decorative laminated sheet or ceramic/ stone tile finish.

Installation: Fix to floor and secure to wall to provide level platform for carcasses.

### **Carcasses**

Material: Select from the following:

- Melamine overlaid high moisture resistant particleboard.
- Approved solid timber sections.

Thickness: 16 mm minimum.

Joints: Select from the following:

- Proprietary mechanical connections.
- Screws and glue.

Shelves: Support on battens or fix directly into grooves in side walls of joinery units.

Finish: Decorative laminated sheet or solid timber finish.

Fasteners: Conceal with finish.

Installation: Secure to walls at not more than 600 mm centres.

### **Drawer fronts and doors**

Material: Refer to the drawings for specific details of joinery or select from the following:

- Melamine overlaid high moisture resistant particleboard.
- Approved solid timber sections with or without inset glass panels.
- Metal grille or sheet metal panels fixed over timber frames

Thickness: 16 mm minimum.

Maximum door size: 2400 mm high, 900 mm wide, 1.5 m<sup>2</sup> on face.

Finish: Decorative laminated sheet, solid timber finish or paint.

### **Drawer backs, sides and bottoms**

Material: Select from the following:

- Melamine overlaid high moisture resistant particleboard.
- Approved solid timber sections.

Thickness: 12 mm minimum.

Finish: Decorative laminated sheet or solid timber finish.

**Laminated benchtops**

Material: High moisture resistant particleboard.

Benchtop thickness: 33 mm.

Finish: Decorative laminated sheet.

Exposed edges: Extend laminate over shaped nosing, finishing > 50 mm back on underside or provide solid timber edge trim.

Installation: Fix to carcass at least twice per 600 mm length of benchtop.

Joint sealing: Clamp with proprietary mechanical connectors to ensure high quality connection between benchtop sections. Ensure joints in benchtops are clear of sinks to avoid water damage to joint.

**Stone or concrete benchtops**

Material:

- Thickness is to be minimum of 40mm unless noted otherwise on the drawings.
- Concrete benchtops may have a polished finish or be covered with ceramic tiles.

**Splashback:**

Material is identical to benchtop unless noted otherwise.

- Thickness is to be 16mm for high moisture resistant particleboard with laminate finish.
- Thickness is to be 20mm minimum for stone.
- Thickness is to be 40mm minimum for concrete. Alternatively use ceramic tile splashback for concrete benchtops.
- Waterproof silicone sealant is to be used as a continuous seal between the benchtop and splashback.

**Drawer and door hardware**

Hinges, drawer runners, door handles and locks are to be to the approval of the Engineer.

**2.4 TIMBER BALUSTRADES**

Provide materials for the approval of the Engineer before installation. Ensure all dimensions are checked on site before construction starts. Refer to BOQ and drawings for extent of work.

**3 EXECUTION**

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**3.1 JOINERY**

**General**

Joints: Provide materials in single lengths whenever possible. If joints are necessary make them over supports.

Framing: Frame and trim where necessary for openings, including those required by other trades.

**Accessories and trim**

Provide accessories and trim necessary to complete the installation.

**Fasteners**

Visibility: Do not provide visible fixings except in the following locations:

- Inside cupboards and drawer units.
- Inside open units.

Visible fixings: Where fastenings are unavoidable on visible joinery faces, sink the heads below the surface and fill the sinking flush with a material compatible with the surface finish. In surfaces which are to have clear or tinted timber finish provide matching wood plugs showing face (not end) grain. In surfaces which are to have laminate finish provide proprietary screws and caps finished to match.

Fixings: Screws with washers into timber or steel framing, or masonry anchors to brickwork.

## Adhesives

Provide adhesives to transmit the loads imposed and to ensure the rigidity of the assembly, without causing discolouration of finished surfaces.

## Finishing

Edge strips: Finish exposed edges of sheets with edge strips which match sheet faces or use solid timber trims as noted on the drawings.

Matching: For surfaces which are to have clear or tinted finish, arrange adjacent timber pieces to match the grain and colour.

Hygiene requirements: To all food handling areas and voids at the backs of units to all areas, seal all carcass junctions with walls and floors, and to cable entries, with silicone sealant for vermin proofing. Apply water resistant sealants around all plumbing fixtures and ensure the sealants are fit for purpose.

## 3.2 DELIVERY AND STORAGE

### General

Deliver joinery units to site in unbroken wrapping or containers so that its moisture content is not adversely affected. Do not store in areas of wet plaster. Keep storage to a minimum by delivering items only when required for installation.

Examine joinery units for completeness and repair defects before installing in place.

### Background

Clean all background surfaces that will be permanently concealed behind joinery before installing in place.

## 3.3 TIMBER BALUSTRADES

### General

Provide a balustrade to the stair and landing, consisting of posts, handrail, infill panels, and associated mouldings as noted in the BOQ and drawings.

## 3.4 COMPLETION

### Cleaning

Temporary coatings: On or before completion of the works, or before joining up to other surfaces, remove all traces of temporary coatings used as a means of protection.

General: Remove all dust, marks and rubbish from all surfaces and internal spaces. Clean and polish all surfaces such as solid timber, anodised or painted metals, glass, stone, concrete, ceramic tiles and laminates.

Refer to the **Drawings** for locations, type and finishes of joinery items.

## 5.6 METALWORK

### 1 GENERAL

#### 1.1 INSPECTION

##### Notice

Give sufficient notice so that inspection may be made of the following:

- Shop fabricated or assembled items ready for delivery to the site.
- Site erected assemblies on completion of erection.

#### 1.2 SUBMISSION

##### S Samples

Submit samples to the **Sample table** for approval by the Engineer.

##### Sample table

Description	No. of samples
Each type of metal item to be purchased	2



Typical joints of welded or fabricated items	2
Finished sample of each type of painted or anodised metalwork indicating range within colour specified and finish	2
The finish to all stainless steel items	2

Manufacturer's data: Submit manufacturer's published product data and details for purchased items.  
 Stainless steel: For each batch of stainless steel supplied to the works, submit the certificate of compliance specified for the applicable standard.

## **2 PRODUCTS**

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### **2.1 MATERIALS AND COMPONENTS**

#### **Metals**

Performance: Provide metals suited to their required function, finish and method of fabrication, in sections of strength and stiffness adequate for their purpose.

#### **Rivets**

Use blind rivets where available in the required metal.

#### **Masonry anchors**

Proprietary types comprising screws or bolts in self-expanding sockets.

#### **Masonry plugs**

Screws in purpose-made resilient plastic sockets or fixed to timber plugs built into the wall surface.

## **3 EXECUTION**

---

### **3.1 CONSTRUCTION GENERALLY**

#### **Metals**

Provide metals so that they transmit the loads imposed and ensure the rigidity of the assembly without causing deflection or distortion of finished surfaces.

#### **Fasteners**

Materials: Provide fasteners in materials of mechanical strength and corrosion resistance at least equal to that of the lowest resistant metal joined.

To copper and copper alloys: Provide copper or copper-alloy fixing devices only.

To aluminium and aluminium alloys: Provide aluminium alloy or stainless steel fixing devices only.

To stainless steel: Provide appropriate stainless steel materials only.

#### **Fabrication**

Workshop: Fabricate and pre-assemble items in the workshop wherever practicable.

Edges and surfaces: Keep clean, neat and free from burrs and indentations. Remove sharp edges without excessive radiusing.

Tube bends: Form bends in tube without visibly deforming the cross section.

Colour finished work: Match colours of sheets, extrusions and heads of fasteners.

Thermal movement: Accommodate thermal movement in joints and fastenings.

#### **Fabrication tolerances**

Structural work generally:  $\pm 2$  mm from design dimensions.

#### **Joints**

Fit joints to an accuracy appropriate to the class of work. Finish visible joints made by welding, brazing or soldering using grinding, buffing or other methods appropriate to the class of work, before further treatment.

Self-finished metals: Free of surface colour variations, after jointing.

Joints: Fit accurately to a hairline where feasible.

#### **Marking**

Provide suitable and sufficient marks or other means for identifying each member of site-erected assemblies, and for their correct setting out, location, erection and connection.

### **Splicing**

Provide structural members in single lengths where possible. Obtain approval of the Engineer for locations of joints where splices in metalwork cannot be avoided.

## **3.2 WELDING AND BRAZING**

### **General**

Quality: Provide finished welds which are free of surface and internal cracks, slag inclusion, and porosity.

### **Brazing**

General: Ensure brazed joints have sufficient lap to provide a mechanically sound joint. Do not use butt joints relying on the filler metal fillet only.

## **3.3 STAINLESS STEEL FABRICATION**

### **Welding stainless steel**

All tube, angle or thick plate material is to be welded unless noted otherwise on the drawings. Ensure that welds do not discolour the final surface finish in the welding process.

### **Riveting**

Riveting may be used only to join stainless steel sheet or strip less than 1 mm thick. Drill (not punch) the rivet hole, and drive the rivet cold. On completion, clean and passivate the riveted assembly.

### **Soldering**

Do not solder stainless steel.

## **3.4 METAL FIXTURES**

### **General**

Provide metal fixtures where noted on drawings as follows:

- Components such as toilet roll holders, towel rails, soap dishes and their location, indicative construction details, trims, materials, dimensions and thicknesses, and finishes shall be as detailed.
- All dimensions noted on drawings shall be confirmed on site.

## **3.5 PIPE HANDRAILS, STAIRS, LADDERS AND BALUSTRADES**

### **Assembly**

Material: Refer to drawings and BOQ for details of member sizes and assembly of components.

### **Fabrication**

Method: Welding.

Joints: Produce smooth unbroken surfaces at joints. Make end-to-end joints over an internal sleeve.

Bends: Make changes of direction in rails by evenly curved pipe bends.

Free ends: Seal the free ends of pipes with fabricated or purpose-made end caps.

### **Fixing to structure**

Provide fabricated predrilled or purpose-made brackets or post bases, and attach the pipework to the building structure with fixings, including bolts into masonry anchors, and coach screws or bolts into timber, of metal compatible with the pipework.

### **Galvanizing**

If possible, complete fabrication before galvanizing; otherwise apply a zinc-rich primer to affected joint surfaces.

### **Painting**

If possible, complete fabrication before painting; otherwise apply paint to affected joint surfaces after fixing on site. Make good all damaged painted surfaces before completion of the building works.

## **3.6 CORNER GUARDS AND VEHICLE GUARDS**

### **Corner Guards**

Where corners of the structure are required to be protected from mechanical damage, provide metal corner guards as follows and as identified on the drawings or in the BOQ:

- Consisting of angle sections or sections fabricated from metal sheet bent to the radius or angle of the corner.

- Fitting close to adjoining surface finishes.
- Solidly grouted up at the back to eliminate voids.
- Securely fixed by a method which does not cause distortion in the guard surface, and consists of either concealed built in lugs, or flush countersunk head fixings into masonry anchors.

#### **Vehicle Guards**

Where external features such as lamp posts, fire hose reels or pedestrian walkways are required to be protected from vehicle damage, provide metal guards as follows and as identified on the drawings and in the BOQ:

- Consisting of steel pipe posts set in deep concrete pads with welded end caps or bent to form a rail and two posts.
- Steel barrier rails securely bolted to the posts.
- Heavy duty protection posts will be large diameter steel pipe posts filled with concrete.

### **3.7 WATER STORAGE TANKS AND STANDS**

#### **Water Tanks**

Fabricate metal water storage tanks to sizes shown on drawings and as identified in the BOQ. Allow for all reinforcement of tank walls, floors, and around fixtures projecting from the tank.

Bolt together prefabricated plastic or metal water storage tanks to sizes shown on drawings and as identified in the BOQ.

Fabricate metal tank stands for the water storage tanks as identified on the drawings and in the BOQ.

### **3.8 COMPLETION**

#### **Maintenance manual**

General: Submit manufacturer's published recommendations for service use.

#### **Cleaning**

Temporary coatings: On or before completion of the works, or before joining up to other surfaces, remove all traces of temporary coatings used as a means of protection.

### **5.7 STAINLESS STEEL BENCHING**

#### **1 GENERAL**

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##### **1.1 INSPECTION**

###### **Notice**

Give sufficient notice so that inspection may be made of the units when fabrication is complete, before delivery.

##### **1.2 SUBMISSION**

###### **S Samples**

Submit samples to the **Sample table** for approval by the Engineer.

###### **Sample table**

<b>Description</b>	<b>No. of samples</b>
Typical joints of welded or fabricated items	2
The finish to all stainless steel items	2

Stainless steel: For each batch of stainless steel supplied to the works, submit the certificate of compliance specified for the applicable standard.

###### **Site welding**

General: If site welding is proposed, submit details indicating location and process.

## 2 PRODUCTS

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### 2.1 MATERIALS

#### **Stainless steel**

Plate, sheet, strip, bar and pipe: To ASTM standards.

Type: 304.

#### **Stainless steel sheet**

Surface finish: Fine brushed finish not including to underside of shelves, and door backs and drawer backs.

Thickness: 1.2 mm minimum.

#### **Particleboard**

Use moisture resistant particleboard minimum thickness 12mm to splashback and 25mm to benchtop as substrate for support of flat sheet.

#### **Plywood**

Use external grade structural plywood minimum thickness 12mm to splashback and 25mm to benchtop as substrate for support of flat sheet.

### 2.2 COMPONENT

#### **S Fasteners**

Material: Stainless steel.

Dimensional system: Metric.

Bolt and screw heads: Polished, pan type or countersunk.

#### **Hardware**

Material: Stainless steel.

Handles: Stainless steel unless noted otherwise.

#### **Sealants**

Type: Neutral cure one-part silicone.

Performance: Flexible. Resistant to growth of mould, bacteria and fungi. Colourfast.

#### **Adhesive**

Type: Spray contact adhesive.

## 3 EXECUTION

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### 3.1 FABRICATION GENERALLY

#### **Stainless steel welding**

Process: Gas tungsten arc welding.

Weld type: Butt.

Surface finish: Grade I, 120 grit.

Welding materials: Compatible with metal being welded.

Weld quality: Free from imperfections such as cracks and pits. Grind and polish to give required surface finish. Continuous exposed welds.

Joints: Strength at least that of parent metal. Free from crevices and folds.

Joint position: At corners and edges as far as possible. Minimise joints in flat panels.

#### **Protection**

Provide temporary self-adhesive plastic film to stainless steel surfaces.

#### **Hardware fixing**

Drill and tap, or weld fix.

#### **Finishing grain direction**

Benches and shelves: Lengthwise.

Bowls: Horizontal to sides, parallel to bench grain to bottom. Mitre at bottom corners.

Abutting surfaces: Parallel where possible.

### **3.2 BENCH TOPS FABRICATION**

#### **Bench tops**

Material: Stainless steel sheet.

Thickness: 2 mm.

Refer to drawings for details of bench construction and nominal overall sizes. Confirm all dimensions on site before fabricating bench units.

Exposed corners: Radius exposed corners at least 5 mm, including back vertical corners of upstands.

Internal back vertical corners: Fuse only from behind.

Wet bench perimeter: Except at wall flashing, provide a raised bead, with a fascia.

Dry bench perimeter: Except at wall flashing, provide a fascia.

#### **Fascia**

Fascia height: 30mm unless noted otherwise.

Fascia return: Full depth of bench top unless noted otherwise.

#### **Drainer**

Drainer falls to sinks: 1:50, 450 mm long.

Drainer surface: Plain.

#### **Wall splashback**

Type: Integral.

Height above bench: 300mm unless noted otherwise.

Ends: Return for full width of bench top.

#### **Fixing to support frame**

Type: Screw fix benchtop to support frame through welded lugs on front and back frames at 600mm centres into plywood or particleboard substrate. Provide star washers under screwheads.

If no substrate is used, weld benchtop to frame on welded lugs on front and back frames at maximum 300mm centres.

### **3.3 BOWL FABRICATION**

#### **Bowls**

Type: Deep drawn stainless steel.

Thickness:

- Capacity < 75 L: 1.6 mm.
- Capacity ≥ 75 L: 2 mm.

Internal radii: 25 mm minimum.

Minimum depth: 250 mm.

Wastes:

- Size (minimum): 50mm diameter.
- Position: Centred in single bowls, adjacent in double bowls.
- Plug: Heavy-duty commercial.

Fall to waste (minimum):

- Capacity < 75 L: 10 mm.
- Capacity ≥ 75 L: 25 mm.

### **3.4 FRAME FABRICATION**

#### **Bench top support frame**

Support: Provide sufficient support so that no load is placed on the waste pipe or water connections.

- Design deflection (maximum): 3 mm.

Members: 31.8 x 31.8 x 1.6 mm stainless steel pipe. Seal ends.

Extent: Perimeter and at sides of bowls, with additional members spaced as follows:

- 1.6 mm sheet: 350 mm maximum centres.

- 2 mm sheet: 500 mm maximum centres.

Maximum unsupported area: 0.3 m<sup>2</sup>.

If 25mm plywood or particleboard substrate is used, the benchtop can be supported on front and back rails only, with additional members at 1200mm maximum centres.

Connections: Welded.

### **Bench legs**

Members: 31.8 x 31.8 x 1.6 mm stainless steel pipe. Seal ends.

Fixing to bench top support frame: Weld all around at junctions.

Spacing: 1200 mm maximum.

Fixing to walls: Predrilled 100 x 50 x 2 mm stainless steel plate welded to legs at 600 mm high.

Feet: Nylon or chrome-plated aluminium, adjustable vertically  $\pm 25$  mm. Threaded section must not protrude from leg.

## **3.5 SHELVING FABRICATION**

### **Under bench shelving**

Material: Stainless steel.

Thickness: 1.6 mm.

Shelf support: 30 x 30 x 5 mm stainless steel angles.

- Extent: Perimeter, with additional angles spaced to give a maximum unsupported area of 0.3 m<sup>2</sup>.

Connections: Welded.

Fixing of support to legs: Welded.

If 25mm plywood or particleboard substrate is used, the shelf can be supported on front and back rails only, with additional members at 1200mm maximum centres.

Fixing of shelf to support: as for benchtop support.

### **Over bench shelving**

Material: Stainless steel.

Thickness: 1.6 mm.

Shelf support: 25.4 x 25.4 x 1.6 mm stainless steel pipe brackets minimum 300mm high above the shelf level. Seal ends.

- Spacing: 900 mm maximum with 25mm substrate or shelf fabricated with 30 x 30 x 5 mm stainless steel angles, 600mm with 12mm substrate.

- Fixing to wall: Two 50 x 50 x 5 mm stainless steel plates, fixed with at least two M8 bolts. Weld to top and bottom of the support brackets.

Fixing of shelf to support: Screw fix minimum of 3 times through tube into side of shelf or shelf angles. Seal between shelf and support.

## **3.6 DRAWERS FABRICATION**

### **Drawers**

Material: Stainless steel.

Thickness: 1.2 mm.

Construction: Welded.

Frames: Removable, and interchangeable with other drawer frames. Provide extension-type drawer slide mechanism and front panel. Provide rubber stops at rear.

Front panel: 20 mm thick double pan construction. Housing:

Back and 2 sides, of a neat external appearance.

Runners: Incline to rear so drawers roll closed. Provide stop so drawer cannot be pulled out accidentally.

Locks: Chrome-plated brass.

## **3.7 INSTALLATION GENERALLY**

### **Welding**

Preference should be given to any other fixing method other than site welding. Obtain approval from the Engineer for any proposed site welding.

### **Sealing**

Gaps < 5 mm wide: Apply sealant at the following locations:

- Butt joints between benches.
- Between benches, including flashings, and walls.
- Spaces and gaps under benches.

Gaps  $\geq$  5 mm wide: Close with stainless steel infill panels.

**Floor fixing**

8 mm diameter stainless steel dowels, sealed to floor with silicone sealant.

**3.8 COMPLETION**

**Protection**

General: Temporary self-adhesive plastic film: Remove from stainless steel surfaces.

<b>5.9 WINDOW COVERINGS</b>
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**1 GENERAL**

**1.1 INSPECTION**

**Notice**

Give sufficient notice so that inspection may be made of the building locations and surfaces prepared to receive window coverings before installation.

**1.2 SUBMISSION**

**S Samples**

Submit 2 samples of each of the following where applicable, for approval by the Engineer:

- Sections proposed to be used for frames, louvres and slats.
- Finishes to prepared surfaces with trims.
- Colour range samples of fabrics, facings and production material.
- Manufacturer's standard control system furniture items.

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**2 PRODUCTS**

**2.1 MATERIALS**

**Fire hazard**

Do not provide materials which, when subject to fire conditions, will emit excessive smoke or dangerous fumes.

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**3 PRODUCTS**

**3.1 INTERNAL**

**Curtains and fabric shades**

Install curtains or shades to locations identified on drawings or in BOQ. Check all dimensions on site before fabricating track and making curtains.

**Aluminium Venetian blinds**

Install aluminium blinds to locations identified on drawings or in BOQ. Check all dimensions on site before fabricating track and making blinds.

Slat material: High tensile aluminium alloy.

Thickness: 0.175 mm.

Cord: 1.5 mm thick polyester with braided jacket and safety tassel, and ladders for location and control.

Top and bottom rails: 0.5 mm aluminium zinc coated steel powdercoat finish.

### **Plastic Venetian blinds**

Install plastic blinds to locations identified on drawings or in BOQ. Check all dimensions on site before fabricating track and making blinds.

Slat material: Extruded polystyrene.

Thickness: 3 mm nominal.

Slat width: 50 mm nominal.

Cord: Internal 2.3 mm thick polyester.

Tape: To allow a 42 mm pitch between ladders and a 8 mm slat overlap.

Top and bottom rails: 0.5 mm aluminium zinc coated steel powdercoat finish.

### **Timber Venetian blinds**

Install timber blinds to locations identified on drawings or in BOQ. Check all dimensions on site before fabricating track and making blinds.

Slat material: Approved timber

Thickness: 5 mm nominal.

Slat width: 50 mm nominal.

Cord: Internal 2.3 mm thick polyester.

Tape: To allow a 42 mm pitch between ladders and a 8 mm slat overlap.

Top and bottom rails: 0.5 mm aluminium zinc coated steel powdercoat finish.

### **Vertical louvre blinds**

Install vertical blinds to locations identified on drawings or in BOQ. Check all dimensions on site before fabricating track and making blinds.

Type: Louvres supported by a carrier system which traverses on wheels and operates with a friction spring loaded clutch mechanism.

Louvre blades: Heavy duty fabric or vinyl coated fabric blades in single, straight lengths finishing 10 mm above floor or sill level, without twists, warp, bows, edge ripples or fraying. Fix a weight into a pocket formed in the bottom of each blade.

Spacings: Space the blades evenly with plastic spacers which lock into the carrier rail to provide a continuous linkage, and fix with sealed plastic slat holders carried by plastic rotation pivots. Connect the bottoms of the blades by a plastic link chain with reversers.

Tracks: Fabricated to suit size of blades for width of window or within a pelmet extending past the face of the window.

Operation: Dual continuous loop chains controlling the functions of tilting and drawing.

## **4 EXECUTION**

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### **4.1 INSTALLATION**

#### **General**

Fixing: Secure the tracks with ceiling clamps or wall mounted brackets so that there are no fixings through the track.

### **4.2 COMPLETION**

#### **Maintenance manual**

Submit the manufacturers' data as follows:

- Recommendations for service use, care and maintenance.
- List of manufacturers and suppliers of replacement parts.



## 6.1 PLASTERING

### 5 GENERAL

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#### 5.1 INTERPRETATION

##### Abbreviations

For the purpose to this worksection the abbreviations given below apply.

- CRF: Cement render – finish.
- CRM: Cement render – medium.
- CRS: Cement render – stronger.
- CRW: Cement render – weaker.
- LF: Lime felting render- weaker.
- GPF: Gypsum plaster – finish.

#### 5.2 INSPECTION

##### Notice

Give sufficient notice so inspection may be made of the following:

- Backgrounds immediately before applying base coats.
- Finish treatments before decoration.

### 6 PRODUCTS

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#### 6.1 MATERIALS AND COMPONENTS

##### Accessories

Beads: To be metal proprietary sections manufactured to be fixed to backgrounds and/or embedded in the plaster to form and protect plaster edges and junctions.

##### Aggregates

Sand: To be fine, sharp, well-graded sand with a low clay content and free from efflorescing salts.

##### Bonding products

To be proprietary products manufactured for bonding cement-based plaster to solid backgrounds.

##### Cement

Cement shall conform to the requirements of ASTM specification C-150 Type 1 or similar approved standard for normal Portland cement.

##### Colouring products

To be proprietary products manufactured for colouring cement plaster.

Integral pigment proportion: 5% by mass of cement.

##### Curing products

To be proprietary products manufactured for use with the plaster system.

##### Gypsum plaster

To be a proprietary product containing calcium sulfate hemihydrate with additives to modify setting.

##### Lime

Confirm source of Lime with Engineer to ensure highest quality Lime is used in the mortar. Protect from damage on site and store minimum 300mm above ground in waterproof storage facility.

Preparing lime putty:

- Using hydrated lime: Add lime to water in a clean container and stir to a thick creamy consistency. Leave undisturbed for at least 16 hours. Remove excess water and protect from drying out.
- Using quicklime: Run to putty as soon as possible after receipt of quicklime. Partly fill clean container with water, add lime to half the height of the water, then stir and hoe ensuring that no lime

remains exposed above the water. Continue stirring and hoeing for at least 5 minutes after all reaction has ceased, then sieve into a maturing bin. Leave undisturbed for at least 14 days. Protect from drying out.

### Mixes

Select a mix ratio to suit the application in conformity to the **Mixes table**.

Measurement: Measure binders and sand by volume using buckets or boxes. Do not allow sand to bulk by absorption of water.

Plaster mixing: Machine mix for greater than 3 minutes and less than 6 minutes.

Strength of successive coats: Ensure successive coats are no richer in binder than the coat to which they are applied.

### Mixes table

Mix type		Application	Upper and lower limits of proportions by volume			
			Gypsum	Cement	Lime	Sand
Cement render coats in: •Single or multi-coat systems with integral finishing treatments •Base coats in multi-coat systems with cement or gypsum finishes	CRS	Dense and smooth concrete and masonry Thrown finishing treatments Tiled finishes Gypsum finishes Cement finishes	- -	1 1	0 0.5	3 4.5
	CRM	Clay or concrete masonry	- -	1 1	0.5	4.5 6
	CRW	Lightweight concrete masonry and other weak backgrounds	- -	1 1		6 9
Cement finish coats	CRF	Cement render base coats	- -	1 1	1	1.5 2
Lime felting finish coats	LF	Cement render base coats			1	3
Gypsum finish coats	GPF	Cement render base coats	3 1	- -	1 1	- 1

### Movement control joint products

To be proprietary products manufactured for use with the plastering system and to accommodate the anticipated movement of the backgrounds and/or the plaster.

### Water

To be clean and free from any deleterious matter.

## 7 EXECUTION

### 7.1 PREPARATION

#### Substrates

Ensure substrates have:

- Any deposit or finish which may impair adhesion of plaster cleaned off.
- If solid or continuous, excessive projections hacked off and voids and hollows filled with plaster stronger than the first coat and not weaker than the background.

Absorbent substrates: If suction is excessive, control it by dampening but avoid over-wetting and do not plaster backgrounds showing surface moisture.

Dense concrete: If not sufficiently rough to provide a mechanical key, roughen by scratching or hacking to remove 2 mm of the surface and expose the aggregate then apply a bonding treatment.

Painted surfaces: Remove paint and hack the surface at close intervals.

Untrue substrates: If the substrate is not sufficiently true to ensure conformity with the thickness limits for the plaster system or has excessively uneven suction resulting from variations in the composition of the background, apply additional coats.

### **Beads**

Location: Fix beads as follows:

- Angle beads: At all external corners.
- Drip beads: At all lower terminations of external plaster.
- Mechanical fixing to background: at 300 mm centres.
- Movement control beads: At all movement control joints.
- Stop beads: At all terminations of plaster and junctions with other materials or plaster systems.

### **Bonding treatment**

If bonding treatment is required, throw a wet mix onto the background as follows:

- Cement plaster: 1 part cement to 2 parts sand.
- Gypsum plaster: 1 part gypsum to 2 parts sand.

Curing: Keep continuously moist for 5 days and allow to dry before applying plaster coats.

Thickness: From greater than 3mm but less than 6 mm.

### **Embedded items**

If there are water pipes and other embedded items, sheath them to permit thermal movement. Ensure embedded items will have a suitable level of corrosion resistance prior to embedment.

## **7.2 APPLICATION**

### **Plastering**

General: Provide plaster finishes as follows:

- Resistant to impacts expected in use.
- Free of irregularities.
- Consistent in texture and finish.
- Firmly bonded to substrates for the expected life of the application.
- As a suitable substrate for the nominated final finish.

Base coats: Scratch-comb each base coat in two directions when it has stiffened.

### **Finishing treatments**

Plain:

- Bag: To be a finish mainly free from sand by rubbing the finish coat with a Hessian pad when it has set firm.
- Carborundum stone: To be a smooth finish free from sand by, rubbing the finish coat with a fine carborundum stone when it has set hard.
- Steel trowel: To be a smooth dense surface by steel trowelling which is not glass-like and is free from shrinkage cracks and crazing.
- Wood or plastic float: To be an even surface by wood or plastic floating the finish coat on application.

### **Incidental work**

Return plaster into reveals, beads, sills, recesses and niches. Plaster faces, ends, and soffits of projections in the background, such as string courses, sills, and other wall features. Trim around openings. Plaster exposed inside of built-in cupboards.

### **Joining up**

If joining up is required, ensure joints will not be visible in the finished work after decoration.

### Movement control joints

Provide movement control joints in the finish to coincide with movement joints in the background. Ensure that the joint in the background is not bridged during plastering.

- Depth: Extend the joint right through the plaster and reinforcement to the background.
- Width: 3 mm, or the same width as the background joint, whichever is greater.

Damp-proof courses: Do not continue plaster across damp-proof courses.

V-joints: Provide V-joints, cut right through the plaster to the background, at the following locations:

- Abutments with metal door frames.
- Abutments with other finishes.
- Junctions between different backgrounds.

### Plaster thickness

Conform to the **Plaster thickness table**.

#### Plaster thickness table

Plaster	Application	Upper limit of thickness (mm)			
		Single coat systems	Multi-coat systems		
			Base coat(s)	Finish coat	System
Cement render base coats and cement or gypsum finish coats	On smooth dense concrete	12	10	4	13
	On clay and concrete brickwork and other backgrounds	15	13	4	16

### Temperature

If the ambient temperature is less than 10°C or more than 30°C ensure that the temperature of mixes, backgrounds and reinforcement are, at the time of application, greater than 5°C or less than 35°C.

## 7.3 TOLERANCES

### General

Conform to the **Tolerances table**.

#### Tolerances table

Property	Tolerance criteria: Permitted deviation (mm)
Features <sup>1</sup> : Verticality in 2000 mm	3
Features: Horizontality in 2000 mm	3
Soffits: Horizontality in 2000 mm	5
Walls: Verticality in 2000 mm	5
Walls: Flatness <sup>2</sup> in 2000 mm	4
<sup>1</sup> Features: Conspicuous horizontal or vertical lines including external corners, parapets, reveals, heads, sills, movement control joints and mouldings.	
<sup>2</sup> Flatness: Measured under a straightedge laid in any direction on a plane surface.	

## 7.4 COMPLETION

### Curing

General: Prevent premature or uneven drying out and protect from the sun and wind.

Keeping moist: If a proprietary curing agent is not used, keep the plaster moist as follows:

- Base coats and single coat systems: Keep continuously moist for 2 days and allow to dry for 5 days before applying further plaster coats.
- Finish coats: Keep continuously moist for 2 days.

## 6.2 CEMENTITIOUS TOPPINGS

### 1 GENERAL

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#### 1.1 INTERPRETATIONS

##### Abbreviations

For the purposes of this worksection the abbreviations given below apply.

- BCS: Bonded – cement and sand.
- BFC: Bonded – fine concrete.
- FFC: Floating – fine concrete.
- MGR: Monolithic – granolithic.
- SFC: Separated – fine concrete.

#### 1.2 TOLERANCES

##### General

Thickness:

- Thickness < 15 mm:  $\pm 2$  mm.
- Thickness  $\geq 15 < 30$  mm:  $\pm 5$  mm.
- Thickness  $\geq 30$  mm:  $\pm 10$  mm.

Flatness: Measured under a 3000 mm straightedge laid in any direction on a plane surface:

- Grade A: < 3 mm.
- Grade B:  $\geq 3 < 5$  mm.
- Grade C:  $\geq 5 < 10$  mm.

### 2 PRODUCTS

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#### 2.1 PRODUCTS

##### Admixtures

Introduce in solution in a portion of the mixing water. Ensure a uniform distribution of the admixture in the batch within the mixing period.

##### Aggregates

Coarse aggregate: To be nominal single size.

Fine aggregate: To be fine, sharp, well-graded sand with a low clay content and free from efflorescing salts.

##### Bonding products

To be proprietary products manufactured for bonding cement-based toppings to concrete backgrounds.

##### Cement

Cement shall conform to the requirements of ASTM specification C-150 Type 1 or similar approved standard for normal Portland cement.

##### Colouring products

To be proprietary products manufactured for colouring cement toppings.

Integral pigment proportion: 5% by mass of cement.

**Coloured chips**

To be marble chips of selected colour or proprietary products manufactured for distribution in cement toppings.

**Concrete**

On site batch mixed concrete shall have characteristics and proportions of concrete ingredients which conform to those specified in M-150 (1:2:4).

**Curing products**

To be proprietary products manufactured for use with cement-based toppings and with the floor finish to be laid on the toppings.

**Mixes**

Provide concrete as follows or select mix proportions to the **Mixes table**.

- Air entrainment: ≤ 3%.
- Nominal coarse aggregate size: ≤ 0.3 x topping thickness.
- Slump: 80 mm.

Water quantity: Use the minimum necessary to achieve full compaction and prevent excessive water being brought to the surface during compaction.

**Mixes table**

Mix type		Thickness (mm)	Upper and lower limits of proportion by mass (mm)		
			Cement	Fine aggregate	Coarse aggregate
Bonded – cement and sand	BCS	35	1 1	3 4.5	0 0
Bonded – fine concrete	BFC	40	1 1	3 3	1 2
Floating – fine concrete	FFC	100	1 1	3 3	1 2
Monolithic – granolithic	MGR	Floors and treads: 25 Risers and skirtings: 13	1	2	1
Separated – fine concrete	SFC	70	1 1	3 3	1 2

**Movement control joint products**

Provide products manufactured for use with cement based toppings and accommodate the anticipated movement of the backgrounds and/or the toppings.

**Sealing products**

Provide proprietary products manufactured for the sealing of movement joints in cement-based toppings.

**Slip-resistance products**

Provide proprietary products manufactured to improve the wet-slip resistance of toppings.

- Silicon carbide granules:
  - . Granule size: ≥ 300 < 600 µm.
  - . Colour: Black.

**Surface treatment products**

Provide proprietary products manufactured for use with cement- based toppings to change the characteristics of the surface of the finished topping.

**Reinforcement**

All reinforcing shall be supported and wired together to prevent displacement by construction loads, or the placing of concrete, beyond the tolerances specified in ACI 301. Any tack or spot welding of reinforcement shall not be performed without approval from the Engineer.

Reinforcement shall be free of loose rust and of any other coating which may adversely affect the bond.

## Water

General: To be clean and free from any deleterious matter.

## 3 EXECUTION

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### 3.1 PREPARATION

#### Backgrounds

Ensure backgrounds have:

- Any deposit which may impair adhesion of monolithic or bonded toppings cleaned off.
- Excessive projections hacked off and voids and hollows filled with a mix not stronger than the background nor weaker than the topping.
- Hardened concrete roughened by scratching or hacking to remove 2 mm of the surface and expose the aggregate.

#### Bonded toppings

Before laying topping wash the subfloor with water and use a bonding product or treat as follows:

- Keep wet for  $\geq 2$  hours.
- Remove surplus water and brush on neat cement or a clean slurry of cement and water.
- Place the topping while the slurry is wet.

### 3.2 APPLICATION

#### Laying

Spread the mix and compact and level the surface to finished levels.

Monolithic toppings: Lay while concrete subfloor is plastic and surface water is no longer visible.

Toppings over 50 mm thick:

- Lay in two layers of equal thickness.
- Place a layer of reinforcement between the layers of toppings. Lap reinforcement 100 mm and tie. Do not create four way laps.

#### Floating and trowelling

Machine float finish:

- After levelling, consolidate the surface using a machine float.
- Cut and fill and refloat immediately to a uniform, smooth, granular texture.
- Hand float in locations inaccessible to the machine float.

Flatness: Grade B.

Steel trowel finish: After machine floating finish as follows:

- When the surface has hardened sufficiently, use steel hand trowels to produce the final consolidated finish free of trowel marks and uniform in texture and appearance.

Flatness: Grade A.

Wood float finish: After machine floating finish as follows:

- Use wood or plastic hand floats to produce the final consolidated finish free of float marks and uniform in texture and appearance.

Flatness: Grade A.

#### Floor finish dividers

Finish cementitious toppings at junctions with differing floor finishes with a corrosion resistant metal dividing strip suitable fixed to the background, with top edge flush to the finished floor. If changes of floor finish occur at doorways make the junction directly below the closed door.

### **Monolithic toppings**

Coved skirtings: Form coves in the topping material, and finish the top to a neatly struck line. Mitre internal and external angles. 10 mm radius to top of skirting. 25mm radius to junction between floor and skirting.

### **Movement control joints**

Provide movement control joints to divide toppings into bays as follows

- Form in situ using square edge steel forms and trowelling a 3 mm radius to edges.
- Form a groove, extending at least one quarter the depth of the section, either by using a grooving tool, by sawing, or by inserting a premoulded strip.
- Install a movement control joint product.

Bay sizes:

- Area:  $\leq 15 \text{ m}^2$ .
- Length to width ratio:  $\leq 1:1.5$ .

Joints in background: Provide movement control joints in toppings to coincide with joints in the background.

### **Slip-resistance treatment**

Stair treads: Form two grooves and fill with a silicon carbide two-part resin.

- Dimensions: 10 mm deep, 15 mm wide, length  $\geq$  width of tread less 100 mm.
- Position:
  - . First groove: Centre 35 mm from tread nose.
  - . Second groove: Centre 60 mm from step nose.

Plane surfaces: Apply silicon carbide granules after floating and before the topping surface has set, and trowel into the surface so that the granules remain exposed.

- Application rate:  $1 \text{ kg/m}^2$  evenly distributed.

### **Surface colouring**

Apply the colouring product or coloured marble chips after floating and before the topping surface has set and trowel into the surface so that it is even in colour distribution.

### **Temperature**

If the ambient temperature is less than 10°C or more than 30°C ensure that the temperature of mixes, backgrounds and reinforcement are, at the time of application, greater than 5°C or less than 35°C.

## **3.3 COMPLETION**

### **Curing**

General: Prevent premature or uneven drying out and protect from the sun and wind.

Curing: Use a curing product or, as soon as it has set sufficiently, keep the toppings moist by covering with polyethylene film for seven days.



## 6.3 TILING

### 1 GENERAL

#### 1.1 INSPECTION

##### Notice

Give sufficient notice so that inspection may be made of the following:

- Floor preparation and set out of floor tiles before fixing.
- Wall preparation and set out of wall tiles before fixing.
- Control joints before sealing and grouting.

#### 1.2 SUBMISSIONS

##### Samples

Submit labelled samples of tiles, including fittings, accessories, grout and sealants, illustrating the range of variation in colour and finish.

#### 1.3 INTERPRETATIONS

##### Definitions

For the purposes of this worksection the definitions given below apply.

- Substrates: The surfaces on which tiles are bedded.
- Bedding: Mixtures of materials which are applied to substrates in a plastic state and dry and cure to adhere tiles to substrates.
  - . Adhesive bedding: Tiling adhered by adhesives.
  - . Mortar bedding: Tiling adhered in a cementitious mortar bed.
- Pavers: Slabs made from clays, stone, precast concrete and/or other inorganic raw materials generally over 20 mm thick used as coverings for floors and supported over continuous substrates.
- Tiles: Thin slabs made from clays and/or other inorganic raw materials used generally as coverings for floors and walls and adhered to continuous supporting substrates.
  - . Natural stone: Tiles cut from natural stone.
  - . Industrial cast: Tile products of reconstituted stone. Also known as manufactured stone.
  - . Cementitious: Manufactured cement based pre-finished tiles.
  - . Terrazzo – cementitious: Manufactured cementitious terrazzo tiles formed in a suitable machine to give sufficient compaction and density to the finished surface, and moisture cured before grinding and honed at the place of manufacture. Thickness usually 35 mm.
- Wet areas: Areas within buildings with water supply and drainage systems.

#### 1.4 TOLERANCES

##### Completed tiling

Conform to the **Tolerances table**.

##### Tolerances table

Property	Tolerance criteria
Alignment: Deviation of the finished tiles from a 3 m straight edge laid against any joints	< 4 mm
Flatness: Deviation of any plane surface under a 3 m straight edge laid in any direction on an area of uniform grade	< 4 mm

## **2 PRODUCTS**

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### **2.1 TILES AND ACCESSORIES**

#### **Tiles**

Coves, nosings and skirtings: To be matching stop-end and internal and external angle tiles moulded for that purpose.

Exposed edges: To be purpose-made border tiles with the exposed edge glazed to match the tile face. If such tiles are not available, round edge with grout.

### **2.2 ADHESIVES**

#### **Type**

General: Provide adhesives compatible with the materials and surfaces to be adhered.

Prohibited uses: Do not provide the following combinations:

- Cement-based adhesives on wood, metal, painted or glazed surfaces, gypsum-based plaster.
- Organic solvent-based adhesives on painted surfaces.
- Organic PVC-based adhesives and organic natural rubber latex adhesives in damp or wet conditions.
- PVA (polyvinyl acetate) based adhesives in wet areas or externally.

### **2.3 MORTAR**

#### **Materials**

Cement: Cement shall conform to the requirements of ASTM specification C-150 Type 1 or similar approved standard for normal Portland cement.

- White cement: Iron salts content  $\leq 1\%$ .
- Off-white cement: Iron salts content  $\leq 2.5\%$ .

Lime: Confirm source of Lime with Engineer to ensure highest quality Lime is used in the mortar. Protect from damage on site and store minimum 300mm above ground in waterproof storage facility.

Sand: Fine aggregate with a low clay content selected for grading, sharp and free from efflorescing salts.

Measurement of volume: Measure binders and sand by volume using buckets or boxes. Do not allow sand to bulk by absorption of water.

#### **Bedding mortar**

Proportioning: Select proportions from the range 1:3 – 1:4 cement:sand to obtain satisfactory adhesion. Provide minimum water.

Terra cotta tiles: Use proprietary polymer modified mortar.

#### **Water**

General: To be clean and free from any deleterious matter.

### **2.4 GROUT**

#### **Type**

Cement based proprietary grout: Mix with water. Fine sand may be added as a filler in wider joints.

Terra cotta tiles: Use proprietary polymer modified grout.

Portland cement based grout: Mix with fine sand. Provide minimum water consistent with workability.

- For joints  $< 3$  mm: 1 cement:2 sand.
- For joints  $\geq 3$  mm: 1 cement:3 sand.

#### **Pigments**

Pigments for coloured grout: Provide colourfast fillers compatible with the grout material. For cement-based grouts, provide lime-proof natural or synthetic metallic oxides compatible with cement.

### 3 EXECUTION

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Provide tiling systems to walls, floors and other substrates as follows:

- Consistent in colour and finish.
- Firmly bonded to substrates for the expected life of the installation.
- Resistant to expected impacts in use.
- Set out with joints accurately aligned in both directions and wall tiling joints level and plumb.
- To direct all water flowing from supply points to drainage outlets without leakage to the substrate or adjacent areas.

#### 3.1 SUBSTRATES

##### **Drying and shrinkage**

Before tiling, allow at least the following times to elapse (for initial drying out and shrinkage) for these substrates:

- Concrete slabs: 42 days.
- Concrete blockwork: 28 days.
- Toppings on slabs and rendering on blockwork: A further 21 days.

#### 3.2 PREPARATION

##### **Ambient temperature**

If the ambient temperature is less than 5 or more than 35°C, do not lay tiles.

##### **Substrates**

Ensure substrates are as follows:

- Clean and free of any deposit or finish which may impair adhesion or location of tiles.
- If solid or continuous, excessive projections are hacked off and voids and hollows are filled with a cement:sand mix not stronger than the substrate nor weaker than the bedding.

Absorbent substrates: If suction is excessive, control it by dampening but avoid over-wetting and do not apply mortar bedding to substrates showing surface moisture.

Dense concrete: If not sufficiently rough to provide a mechanical key, roughen by scratching or hacking to remove 3 mm of the surface and expose the aggregate; then apply a bonding treatment.

#### 3.3 TILING GENERALLY

##### **Sequence**

General: Fix wall tiles before floor tiles.

##### **Cutting and laying**

Cutting: Cut tiles neatly to fit around fixtures and fittings, and at margins where necessary. Drill holes without damaging tile faces. Rub edges smooth without chipping.

Laying: Return tiles into sills and openings. Butt up to returns, frames, fittings, and other finishes.

##### **Variations**

Distribute variations in hue, colour, or pattern uniformly, by mixing tiles or tile batches before laying.

##### **Protection**

Floor tiles: Keep traffic off floor tiles until the bedding has set and attained its working strength.

Cleaning: Keep the work clean as it proceeds and protect finished work from damage.

#### 3.4 SETTING OUT

##### **Tile joints**

Set out tiles to give uniform joint widths within the following limits:

- Ceramic floor tiles: 4 to 6 mm.
- Quarry floor tiles: 6 to 12 mm.
- Terrazzo and stone pavers to floor: 2 to 3 mm.
- Large and/or irregular floor tiles: 6 to 12 mm.

- Mounted mosaics: To match mounting pattern.
- Ceramic wall tiles: 3 to 5 mm.
- Terrazzo and stone wall panels: 2 to 3 mm.

### **Margins**

Provide whole or purpose-made tiles at margins where practicable, otherwise set out to give equal margins of cut tiles. If margins less than half tile width are unavoidable, locate the cut tiles where they are least conspicuous.

### **Fixtures**

If possible position tiles so that holes for fixtures and other penetrations occur at the intersection of horizontal and vertical joints or on the centre lines of tiles. Continue tiling fully behind fixtures which are not built in to the tiling surface. Before tiling ensure that fixtures interrupting the tile surfaces are accurately positioned in their designed or optimum locations relative to the tile layout.

## **3.5 FALLS AND LEVELS**

### **Grading**

Grade floor tiling to even and correct falls to floor wastes and elsewhere as required. Make level junctions with walls. Where falls are not required lay level.

Fall, general: 1:100 minimum.

Fall, in shower areas: 1:60 minimum.

## **3.6 BEDDING**

### **Preparation of tiles**

Adhesive bedding: Fix tiles dry; do not soak.

Mortar bedding: Soak porous tiles in water for half an hour and then drain until the surface water has disappeared.

Terra cotta tiles: Use pre sealed tiles or apply a breathable sealer and lay dry. If a final sealed finish is selected, use a compatible laying sealer.

### **Bedding**

Use bedding methods and materials which are appropriate to the tile, the substrate, the conditions of service, and which leave the tile firmly and solidly bedded in the bedding material and adhered to the substrate. Form falls integral with the substrate.

### **Thin adhesive beds**

Provide only if the substrate deviation is less than 3 mm when tested with a 3 m straight edge. Cover the entire tile back with adhesive when the tile is bedded.

Thickness: 1.5 – 3 mm.

### **Thick adhesive beds**

Provide on substrates with deviations up to 6 mm when tested with a 3 m straight edge, and with tiles having deep keys.

Nominal thickness: 6 mm.

### **Adhesive bedding application**

Apply adhesive by notched trowel to walls and floors and direct to tiles if required, to provide evenly distributed coverage after laying.

Wall tile spacers: Do not use spacer types that inhibit the distribution of adhesive.

Curing: Allow the adhesive to cure for the period nominated by the manufacturer prior to grouting or allowing foot traffic.

### **Mortar beds**

For floor tiles: Either lightly dust the screeded bed surface with dry cement and trowel level until the cement is damp, or spread a thin slurry of neat cement, or cement-based thin bed adhesive, on to the tile back. Do not provide mortar after initial set has occurred.

- Nominal thickness: 20 to 40 mm.

### **3.7 MOVEMENT JOINTS**

#### **General**

- Location:
  - . Over structural (isolation, contraction, expansion) joints.
  - . Close to external corners in large tiled areas.
  - . Around the perimeter of the floor.
  - . At junctions between different substrates.
  - . To divide large tiled areas into bays, maximum 5 m wide, maximum 16 m<sup>2</sup>.
  - . At abutments with the building structural frame and over supporting walls or beams where flexing of the substrate is anticipated.
- Depth of joint: Right through to the substrate.
- Sealant width: 6 – 10 mm.
- Depth of elastomeric sealant: One half the joint width, or 6 mm, whichever is the greater.

#### **Movement joint materials**

Divider strip: A proprietary expansion joint consisting of a neoprene filler sandwiched between plates with lugs or ribs for mechanical keying. Set flush with the finished surface.

Sealant: Two-pack self-levelling non-hardening mould resistant, one-part silicone or polyurethane sealant applied over a backing rod. Finish flush with the tile surface.

Backing rod: Compressible closed cell polyethylene foam with a bond-breaking surface.

### **3.8 GROUTED AND CAULKED JOINTS**

#### **Grouted joints**

Commence grouting as soon as practicable after bedding has set. Clean out joints as necessary before grouting.

Face grouting: Fill the joints solid and tool flush. Clean off surplus grout. Wash down when the grout has set. When grout is dry, polish the surface with a clean cloth.

Edges of tiles: Grout exposed edge joints.

#### **Mosaic tiles**

Grouting mosaics: If paper faced mosaics are to be bedded in cement mortar, pre-grout the sheeted mosaics from the back before fixing. After fixing, rub grout into the surface of the joints to fill any voids left from pre-grouting. Clean off surplus grout. When grout has set, wash down. If necessary use a proprietary cement remover.

#### **Sealant joints**

Provide joints filled with sealant and finished flush with the tile surface as follows:

- Where tiling is cut around sanitary fixtures.
- Around fixtures interrupting the tile surface, for example pipes, brackets, bolts and nibs.
- At junctions with elements such as window and door frames and built-in cupboards.

Width: 5 mm.

Depth: Equal to the tile thickness.

### **3.9 JOINT ACCESSORIES**

#### **Floor finish dividers**

Finish tiled floors at junctions with differing floor finishes with a corrosion resistant metal dividing strip suitably fixed to the substrate, with top edge flush with the finished floor. Where changes of floor finish occur at doorways make the junction directly below the closed door.

### **3.10 COMPLETION**

#### **Cementitious terrazzo tiled surfaces**

In situ grind and polish the completed installation with equipment nominated by the tile supplier.

### **Spare tiles**

Supply spare matching tiles and accessories of each type for future replacement purposes. Store the spare materials on site where directed by the Engineer.

Quantity: At least 1% of the quantity installed.

### **Cleaning**

Clean tiled surfaces using an appropriate tile cleaning agent, and polish.

## **6.6 PAINTING**

### **1 GENERAL**

---

#### **1.1 INSPECTION**

##### **Notice**

Give sufficient notice so that inspection may be made of the substrate immediately before application of paint finishes.

#### **1.2 SUBMISSIONS**

##### **Clear finish coated samples**

Submit pieces of timber or timber veneer matching the timber to be used in the works, prepared and coated in accordance with the paint system.

##### **Opaque coated samples**

Provide approx 600x600mm samples on representative substrates of each paint system showing surface preparation, colour, gloss level and texture. Products

#### **1.3 PAI**

##### **NTS**

##### **Combinati**

##### **ons**

Do not combine paints from different manufacturers in a paint system.

Clear timber finish systems: Provide only the combinations of putty, stain and sealer recommended by the manufacturer of the top coats.

##### **Delivery**

Deliver paints to the site in the manufacturer's labelled and unopened containers.

##### **Tinting**

Provide only products which are colour tinted by the manufacturer or supplier.

##### **Putty**

Non-timber substrates: Oil-based or polymeric based. Timber finishes: Lacquer or water based only.

### **2 EXECUTION**

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#### **2.1 PREPARATION**

##### **Order of work**

Other trades: Before painting, complete the work of other trades as far as practicable within the area to be painted, except for installation of fittings and laying flooring materials.

Clear finishes: Complete clear timber finishes before commencing opaque paint finishes in the same area.

##### **Protection**

Fixtures: Remove door furniture, switch plates, light fittings and other fixtures before starting to paint, and refix in position undamaged on completion of the installation.

Adjacent surfaces: Protect adjacent finished surfaces liable to damage from painting operations.

##### **"Wet paint" warning**

Place notices conspicuously and do not remove them until paint is dry.

#### **Restoration**

Clean off marks, paint spots and stains progressively and restore damaged surfaces to their original condition. Touch up damaged decorative paintwork or misses only with the paint batch used in the original application.

#### **Substrate preparation**

Prepare substrates to receive the painting systems.

**Cleaning:** Clean down the substrate surface. Do not cause undue damage to the substrate or damage to, or contamination of, the surroundings.

**Filling:** Fill cracks and holes with fillers, sealants, putties or grouting cements as appropriate for the finishing system and substrate, and sand smooth.

**Clear finish:** Provide filler tinted to match the substrate.

**Clear timber finish systems:** Prepare the surface so that its attributes will show through the clear finish without blemishes, by methods which may involve the following:

- Removal of discolourations, including staining by oil, grease and nailheads.
- Puttying.

## **2.2 PAINTING**

Provide coating systems to substrates as follows and as scheduled:

- Consistent in colour, gloss level, texture and thickness.
- Free of runs, sags, blisters, or other discontinuities.
- Fully adhered.
- Resistant to expected impacts in use.
- Resistant to environmental degradation within the manufacturer's stated life span.

#### **Drying**

Ensure that the moisture content of the substrate is at or below the recommended maximum level for the type of paint and the substrate material.

#### **Paint application**

Apply the first coat immediately after substrate preparation and before contamination of the substrate can occur. Apply subsequent coats after the manufacturer's recommended drying period has elapsed.

#### **Priming before fixing**

Apply one coat of wood primer (2 coats to end grain) to the back of the following before fixing in position:

- Timber door and window frames.
- Bottoms of external doors.
- Associated trims and glazing beads.

#### **Spraying**

If the paint application is by spraying, use conventional or airless equipment which does the following:

- Satisfactorily atomises the paint being applied.
- Does not require the paint to be thinned beyond the maximum amount recommended by the manufacturer.
- Does not introduce oil, water or other contaminants into the applied paint.

#### **Sanding**

**Clear finishes:** Sand the sealer using the finest possible abrasive and avoid cutting through the colour. Take special care with round surfaces and edges.

#### **Repair of galvanizing**

For galvanized surfaces which have been subsequently welded, prime the affected area.

## **3 SELECTIONS**

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### **3.1 PAINT SYSTEMS**

#### **Paint system description**

Choose from the following paint systems and substrates and paint in accordance with manufacturers recommendations:

**Paint Systems:**

Flat water based: Interior  
Low gloss water based: Interior  
Flat or low gloss water based: Exterior  
Semi-gloss water based: Interior  
Semi-gloss water based: Exterior  
Gloss water based: Interior Gloss  
water based: Exterior Semi-gloss, oil based: Interior Full gloss, oil based: Interior Full gloss, oil based: Exterior  
Texture finish, water based: Interior  
Texture finish, water based: Exterior  
Varnish clear: Interior  
Varnish tinted: Interior  
Opaque timber finish, water based: Exterior  
Paving paint - Semi gloss oil based Roofing paint, oil based  
Low flame spread specialised coating

**Substrate Types:**

Existing paintwork (oil based)  
Existing paintwork (water based)  
Concrete  
Cement render  
Fibre cement  
Brickwork  
Set plaster  
Glass reinforced gypsum plaster  
Plasterboard (paper faced)  
Iron and steel  
Aluminium  
Metallic-coated steel  
Oil-based air-drying primed metal  
Organic or inorganic zinc primed metal  
Timber  
Particleboard  
UPVC

**Number of coats**

Unless specified as one coat or two coat systems, each paint system consists of at least 3 coats.

**Colour selection**

As nominated in the **Drawings or as approved by the Engineer.**







### **3.0 Purpose of QA System**

The purpose of the Quality Assurance System is to ensure that all works being constructed by the Contractor are properly documented, tested and surveyed as required by the Contract conditions. It provides the mechanism whereby only works that comply with these requirements are certified for payment.

In addition, Quality Assurance Plan is to provide guidance and direction for project personnel to perform the necessary tasks to verify that the quality of the contractor's work complies with the specification and drawings and that the works are documented clearly for traceability

### **4.1 Components of the QA Process**

#### **4.2 Requests for Approval (RFA):**

The contractor shall submit for approval of his material sources, drawings, Method statements prior to incorporating any of these things in the works. The necessary RFA are as shown in the Inspection and Test plans for the various work components.

Inspection and Testing plans are to be developed by the Engineer to cover all items of work as required. The purposes of these plans are to clearly set out the type, frequency and nature of QC checks required along with the documentation required.

#### **4.3 Approval To Proceed (ATP)**

The approval to proceed is a submission made by the Contractor for an approval to proceed with the next item of work. Before the approval to proceed is granted the Engineer must be satisfied that all documentation and procedures are in place and conform to the relevant requirements and that all previously completed works are suitable to allow successive works to proceed. The Engineer then either grants the Contractor approval to begin his works or advises what issues are outstanding in order for the requested works to proceed.

Examples of what the Engineer must be satisfied with prior to granting an ATP includes but not limited to approved for construction drawings, ensuring safety certificates are attained, compliance of source materials has been approved and that preceding works are kept and maintained in its approved condition. Items requiring ATP's are set out in ITP's

**In order for the Quality Assurance System to function effectively, then it is important that the timely submittal and processing of the ATP's occurs. To that effect it is the responsibility of all parties to ensure the time limits are adhered to.**

- ATP"s shall be submitted in a timely manner by the Contractor but will be submitted no later than the agreed time on the day prior to the stated inspection dates.
  - Works will be ready for inspection at the time stated by the Contractor or as agreed to by the Engineer prior to the inspection.
  - Works covered by the ATP will not proceed prior to the time stated or agreed to by Engineer.
  - All signed ATP"s will be returned to the Contractor not later than the agreed time on the day after the stated inspection date.
- 
- Where the Engineer's representative does not attend the inspection at the stated or agreed time, then the ATP is „deemed“ to be approved by the Engineer shall be responsible for ensuring that all inspections and tests to demonstrate that the works comply with the requirements of the Contract Documents are carried out.
- 
- Similarly when a copy of the signed of the ATP is not returned to Contractor by the agreed time on the date following the inspection, the ATP is also „deemed“ to be approved. The Engineer shall be responsible for ensuring that all inspections and tests to demonstrate that the works comply with the requirements of the Contract Documents are carried out.
- 
- Where the Contractor does not afford the Engineer the opportunity of inspecting the works covered by submitting an ATP in accordance with these guidelines, then these works shall be at the option of the Engineer either removed at the Contractor's expense or not accepted for payment

#### **4.4 Inspection Test Plans (ITP)**

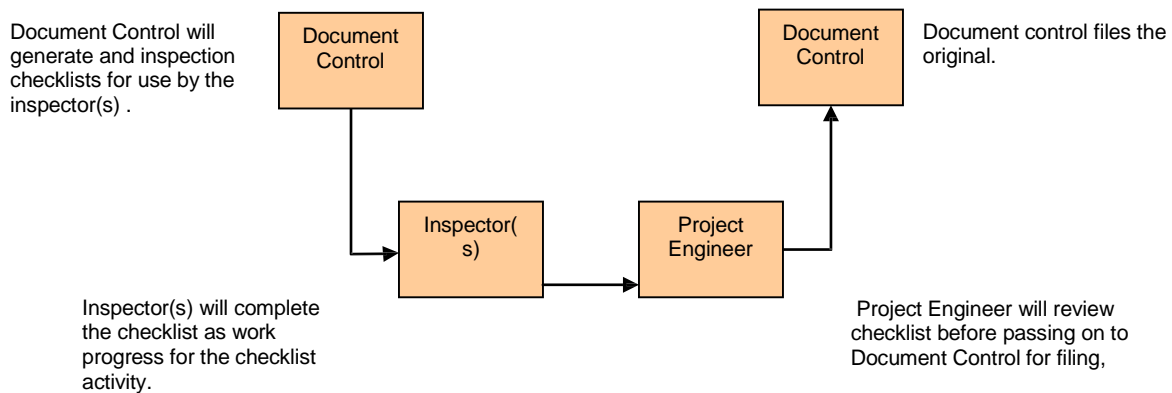
The Inspection Test Plans (ITP) detail the required testing and frequency required for a particular activity. It is important the ITP contains references to the acceptance criteria and frequency of sampling from the specifications. The ITP will be attached to the back of the inspection checklists for the reference of the inspectors on-site.

#### **4.5 Inspection Checklists (IC)**

Inspection Checklists generally form part of the Inspection Test Plans and are used by the inspectors checking the works. For each ITP there may be a number of checklists used as supporting documents with each required to be verified before the referenced hold point on the ITP can be released. The inspection checklists are also used for but not limited to goods delivered to site that require verification of quality, quantity, manufacture, size, source, etc

The inspection checklist is used as a step by step pro forma to ensure all items have been verified as acceptable. Once the Inspection Checklist has been completed and the inspector is satisfied that all items meet the relevant standards, drawings or specifications then that checklist can be signed off as complete. These Checklists should be attached to the relevant ATP by the field inspector prior to submission of the ATP.

#### 4.4.1 Document flow



#### 4.6 Summary Chart

A summary chart is to be displayed in Engineer's office to be maintained by the Project Engineer. It is to contain the major activities of the Contract with status of the ATP's and Requisition Submittals displayed for each major activity.

#### 4.7 Non Conformance Reports

The purpose of the Non-Conformance Report (NCR) is to effectively document works which for any reason whatsoever do not comply with the requirements of the Contract Documents. Secondly, NCR's also ensure that these works are isolated until effective rectification works are carried out, inspected and where necessary tested to ensure that they demonstrate compliance. The third major function of the NCR reports is to ensure that any defective works are not paid for until rectification works are carried out and the works conform to the requirements of the contract documents.

The status of the NCR will be shown in a register and this register shall be kept up to date with monitoring to ensure that NCR's are resolved promptly and the rectification works carried out forthwith. These forms will be used as shown in the following flowchart.

If at any stage during the quality assurance system the Contractor fails to perform works which meet the specifications declared in the Contract, the Engineer will reject the works. A Non-Conformance Report (NCR) will be issued to document the rejection (Refer to Appendix F) of works. The Contractor will re-work the rejected works until re-testing can prove conformity to the specifications of the Contract

#### **4.8 Site Instruction**

The purpose of this document (SI) is to communicate contractor to

### **5 Document Control**

#### **5.2 Presentation and Control of Documents**

Documents are to be presented as per the Conditions of Contract. Certain pertinent details are required to be displayed on the cover page including date submitted, contract number, contractor's name and description of the document. Where applicable revision numbers are required to be shown on the document or submission.

Testing records are to include a sequential numbering system which can be used to identify test results for each material (to be explained in 8.2 coding of Documents).

#### **6.0 Control of Non-Conforming Product**

Non-conforming work will not be allowed to remain incorporated into the works. Neither will non-conforming works be certified for payment. Effective rectification works shall be carried out prior to this work being accepted and payment made. Rectification works shall depend on the nature and severity of the non-conformance.

All instances of non-conforming works shall be documented by the use of the NCR. It is the responsibility of the Project Engineer and Project Manager to ensure that non-conforming product is isolated and not incorporated into the works.

### **6 Appendices**

#### **6.2 Appendix A - Requisition Forms**

#### **6.3 Appendix B – Approval to Proceed**

#### **6.4 Appendix C – Inspection Test Plans & Inspection Checklists**

#### **6.5 Appendix D – Site Instruction Form**

#### **6.6 Appendix E -- Non-Conformance Report**

## *Appendix A : Request For Approval (RFA)*

---

=Engineer:

Contractor:

Contract Number:  
Project Name:

Reference: RFA- -  
Date Submitted:

---

Request for Approvals for the following works:

- |                                    |   |  |
|------------------------------------|---|--|
| <input type="checkbox"/> Materials | <input type="checkbox"/> Excavation/Foundations | <input type="checkbox"/> walls and columns       |
| <input type="checkbox"/> Roofings  | <input type="checkbox"/> Finishing's            | <input type="checkbox"/> Carpentry and Joinery   |
| <input type="checkbox"/> Painting  | <input type="checkbox"/> Metal works            | <input type="checkbox"/> Plastering and Pointing |

Location:  
This will be ready on;

**Date:**  
**Time:**

---

Contractor's Comments/Description:

---

Submitted by: \_\_\_\_\_ Date: \_\_\_\_\_ (day/month/year)  
(Contractor)

Received by: \_\_\_\_\_ Date: \_\_\_\_\_ (day/month/year)  
(DSWD)

---

Contractor Engineer's Comments/Recommendations:

---

Engineer's Comments:

---

Approved  Not Approved, Re-submit

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_ (day/month/year)  
(DSWD)

Certified by: \_\_\_\_\_ Date: \_\_\_\_\_ (day/month/year)  
(DSWD)

## Appendix –B: Request For Approval (RFA)

Engineer:  
 Contract Number:  
 Project Name:

Contractor:  
 Reference: RFA- -  
 Date Submitted:

Request for Approvals for the following works:

- |   |  |                                     |
|---|--|-------------------------------------|
| <input type="checkbox"/> Excavation               | <input type="checkbox"/> Stone Masonry                         | <input type="checkbox"/> Block work |
| <input type="checkbox"/> Concrete                 | <input type="checkbox"/> Plastering, Pointing<br>and Screeding | <input type="checkbox"/> Metal Work |
| <input type="checkbox"/> Brick Work               | <input type="checkbox"/> Painting                              | <input type="checkbox"/> Roofing    |
| <input type="checkbox"/> Carpentry and<br>Joinery |  |                                     |
| <input type="checkbox"/> _____                    |  |                                     |

Location

This will be ready on; **Date:**  
**Time:**

Contractor's Comments/Description:

Submitted by: \_\_\_\_\_ Date: \_\_\_\_\_ (day/month/year)  
 (Contractor)

Received by: \_\_\_\_\_ Date: \_\_\_\_\_ (day/month/year)

Underlying layer/preparation work	Contractor		Engineer			Remarks
	Docu- ment	Name/ Signature	Accepted	Not Accepted	Name/S ignature	
A. Preliminary/ Preparatory Works						
1. General Conditions of Preparation work						
2. Proof Rolling/Compaction if applicable						
3. Approved Drawings						
4. Traffic Control Plan						
B. Materials and Field Testing Compliance						
1. Source Approval/Mat'l Compliance						
2. Field Testing (if applicable)						
C. Survey						
1. Level						
2. Alignment						
3. Staking out Check						

(UNOPS)



I hereby certify that the work and all testing, approvals and documentation required has been carried out to the satisfaction of the Contract.

Certified by \_\_\_\_\_

<input type="checkbox"/> Approved to Proceed <input type="checkbox"/> Approved to Proceed w/ Condition(s) <input type="checkbox"/> Not Granted, Remedial Works Required  Task Order Manager/ Project Engineer  Date _____	<p><b>ENGINEER'S COMMENTS:</b></p>
---	------------------------------------

Contractor Engineer's Comments/Recommendations:  
\_\_\_\_\_

Engineer's Comments:  
\_\_\_\_\_

Approved

Not Approved, Re-submit

Checked by: \_\_\_\_\_  
(UNOPS)

Date: \_\_\_\_\_(day/month/year)

Certified by: \_\_\_\_\_  
(UNOPS)

Date: \_\_\_\_\_(day/month/year)

# Appendix C : Inspection Checklists

Engineer:

Contractor:

Contract Number:

Reference: ITS-EXC-

Project Name:

Date commenced:

## Excavation

+ TO + , STRUCTURE

(Circle one or both for full width)

	S/N	Checklist activity	References	Engineer	Comments
Preliminary Activities	1.	Work Area de-mined			
	2.	If excavation is for unsuitable, submit Request for Testing (RFT) (if applicable)	RFT-		
	3.	If excavation is for unsuitable, submit lab results of samples taken (if applicable)	Lab ref.		
	4.	Approved drawings in hand for design grade/profile	Survey/Drawing ref.		
	5.	Approval to Proceed (ATP) to commence excavation submitted and approved	ATP-		
Preparation Activities	6.	Traffic management has been put in place and is adequate (if applicable)			
	7.	Construction survey in place and adequate			
Work Activities	8.	Toes of slopes have not been undercut (if applicable)			
	9.	Excavation carried out to correct level and line	Survey/Drawing ref.		
	10.	Excavated profile has been compacted (if applicable)			
Pre-Handover	11.	Request for Survey of excavated area has been submitted and approved (if applicable)	RFS-		
	12.	Post-excavation survey has been undertaken and recorded	Survey/Drawing ref.		

Testing references:

...../...../.....

DSWD Inspector

ITP Attached

# Appendix C : Inspection Test Plans

Engineer:  
 Contract Number:  
 Project Name:

Contractor :  
 Date Submitted:  
 Reference: ITP-EXC-001

S/N	Operation or Stage of Work	Stage/Frequency	Records	Specification	Acceptance Criteria	Inspection/Test Procedure	Inspection by	
							Contract or	Engineer
1	Preliminary Approvals acquired	Before excavation	ATP, RFA & ITS	Job requirement	Approved RFI & RFA	Submit ATP & RFA to Engineer for approval	H	H
3	Survey of Existing ground	Before excavation	RFS, Survey reports & ITS	Job requirement	Approved RFS & ITS	Submit RFS to Engineer for approval	H	W
4	Excavation to design (or affected area if unsuitable)	During excavation	ITS	Job requirement	Correctly excavated	Survey instruments and visual check of excavation to design	X	W
5	Compaction of bottom of excavation	After excavation	RFT & ITS	Section 3400, 5.1 (e)	100% MDD(If applicable)	AASHTO T99	W	W
6	Survey of Excavated ground	After excavation	RFS, Survey Report & ITS	Job requirement	Approved RFS & ITS	Submit RFS to Engineer for approval.	H	W
7	Pre-Handover	After excavation	ATP, RFA, RFS, ITS, (& RFT for unsuitable excavation)	Job requirement	All Requests and checklists completed and signed	Review	H	H

**H - Hold Point**

**W - Witness Point**

**X - Self-Inspection**

---

# Appendix D: Site Instruction Form

Engineer:  
Contract Number:  
Project Name:

Contractor:  
Reference:  
Date:

---

**Site Instruction Description:**

Instructed by: \_\_\_\_\_  
(UNOPS)

Date: \_\_\_\_\_ (day/month/year)

Time: \_\_\_\_\_

Received by: \_\_\_\_\_  
(Contractor)

Date: \_\_\_\_\_ (day/month/year)

Time:  
\_\_\_\_\_

---

**Post-Compliance Description**

Contractor's representative: \_  
(day/month/year)

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

UNOP's Representative: \_

Date: \_\_\_\_\_ (day/month/year)

# Appendix E : Non-Conformance Report

Engineer:  
Contract Number:  
Project Name:  
Reference:

Contractor:  
Reference: NCR-  
Date:

**TO: Project Manager**

**Attachment: Drawing / Sketch / Document :**

**DEFICIENCY / RECORD**

Acknowledgment of receipt by Contractor: Name: Signature:  
Project Manager

**Remedial Work Proposed by Contractor**

Remedial Works will be carried out by the date below Name of Contractor's Representative:

Date: Signature

United Nations Office for Project Services	Proposed Remedial Work	Inspected by UNOPS
Date:  Name:  Signature:	ACCEPTABLE: <input type="checkbox"/> NOT ACCEPTABLE: <input type="checkbox"/>  Date:  Name:  Signature:	Remedial work acceptable: <input type="checkbox"/> Remedial work unacceptable: <input type="checkbox"/>  Date:  Name:  Signature:

---

## 8 WATER SERVICES

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### 1 GENERAL

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#### 1.1 AIMS

##### Responsibilities

Provide water services systems subject to the site and other constraints below:

- Cold water services: Connect the cold water supply system to the water source with a stop valve at the connection point. Provide the water source if required to suit the particular conditions as defined on the drawings. Provide the cold water installation to the draw-off points or connections to other services.
- Hot water services: Provide the hot water installation from the cold water connection points to the draw-off points or connections to other services.
- Hose reel system: Provide the hose reel system where defined on the drawings and in the BOQ.
- Sanitary plumbing and drainage: Provide the plumbing and drainage system where defined on the drawings and in the BOQ.
- Stormwater: Provide the stormwater system where defined on the drawings and in the BOQ.
- Subsoil drainage: Provide the subsoil drainage system where defined on the drawings and in the BOQ.

#### 1.2 INSPECTION

##### Notice

Give sufficient notice so that inspection may be made of the following:

- Underground pipework prior to concealment.
- Above ground pipework prior to concealment.

#### 1.3 SUBMISSIONS

##### Execution details

Before starting the respective portions of the installation, submit the following for approval from the Engineer:

- Embedded services: Proposed method for embedding services in concrete walls or floors or chasing into concrete or masonry walls.
- Fixing of services: Typical details of locations, types and methods of fixing of services to structure.
- Inaccessible services: If services will be enclosed and not accessible after completion, submit proposals for location of service runs and fittings.
- Proposals for location of exposed piping.

### 2 EXECUTION

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#### 2.1 INSTALLATION GENERALLY

##### Accessories

Provide the accessories and fittings necessary for the proper functioning of the systems, including taps, valves, outlets, pressure and temperature control devices, strainers, gauges and pumps.

Isolating valves: provide valves so that isolation of parts of the system in the event of leaks or maintenance causes a minimum of inconvenience to building occupants.

##### Arrangement

Services and equipment: Locate and arrange so that:

- Failure of plant and equipment (including leaks) does not create a hazard for the building occupants and causes a minimum or no damage to the building, its finishes and contents.
- maintenance operations can be carried out in a safe and efficient manner, with a minimum of inconvenience and disruption to building occupants and without damaging adjacent structures, fixtures or finishes.

### **Embedded pipes**

Do not embed pipes that operate under pressure in concrete or surfacing material of a building without prior written approval. If embedding is approved:

- Install in continuous lengths without fittings wherever possible.
- Do not lay across joints between adjoining sections of concrete through which reinforcement does not extend.
- Pressure test and rectify leaks before the concrete is poured.

### **Penetrations and fixing**

Limitations: Do not penetrate or fix to the following without prior approval:

- Structural building elements including external walls, fire walls, fire doors and access panels, other tested and rated assemblies or elements, floor slabs and beams.
- Membrane elements including damp-proof courses, waterproofing membranes and roof coverings.

Fire rated building elements: Seal penetrations with a system that maintains the fire rating of the element.

Membranes: If approval is given to penetrate membranes, provide a waterproof seal to the approval of the Engineer between the membrane and the penetrating component.

### **Piping**

Install piping in straight lines, plumb and to uniform grades. Arrange and support the piping so that it remains free from vibration and water hammer, while permitting movement in both structure and services. Keep the number of joints to a minimum. Prevent direct contact between incompatible metals.

Concealment: If practicable, conceal piping and fittings requiring maintenance or servicing so that they are accessible within non-habitable enclosed spaces such as roof spaces, subfloor spaces and ducts. Provide at least 25 mm clearance between adjacent pipelines (measured from the piping insulation where applicable).

Cover plates: Where exposed piping emerges from wall, floor or ceiling finishes, provide cover plates of stainless steel or non-ferrous metal finished to match the piping.

Pipe support materials: To be the same as the piping or galvanized or non-ferrous metals, with bonded PVC or glass fibre woven tape sleeves where needed to separate dissimilar metals.

### **Pits**

Location: Install below-ground water meters, control valves and gas regulators in concrete access pits with removable pit covers.

Internal dimensions: To give 300 mm clear space all around the fittings in the pit.

Concrete: Grade M-200, 100 mm thick, with reinforcement fabric.

Pit covers: To be minimum of 5mm thick steel covers with finger holes for easy removal.

Installation: Grade floor to a point on one side and drain to the stormwater drainage system. Carry the pit walls up to 50 mm above finished ground level. Cast in the pit cover frame flush with the top. Trowel the top smooth.

### **Valve boxes**

Location: Install underground isolating valves in concrete access pits with removable pit covers.

Identification: Mark the box covers with the name of the service.

## **2.2 INSTALLATION OF FIXTURES**

### **General**

Accessories: Use manufacturer's brackets and accessories where these are available and suitable for the mounting substrate.

Protection: Deliver fixtures to site protected from damage under site conditions by coatings, coverings and packaging. Remove only sufficient protection to permit installation.

### **Installation**

Connections: Connect to each fixture supply and waste services. Install plumb and level.

Cutting and fitting: If it is necessary to cut and/or fit substrate to install an item carry out this before the surface is finished or painted. Remove items when required for painting and protect until re-installed. Reinstall when painting and finishing is complete. Cap or plug the open ends of pipes.

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Substrate and fixings: Before installation make sure that the substrate to which the fixtures are to be installed is adequate. In solid walls confirm adequacy of the material at fixing locations.

### **2.3 PAINTING, FINISHES AND MARKING**

#### **Exceptions**

Do not paint chromium or nickel plating, anodised aluminium, glass reinforced plastic, stainless steel, non-metallic flexible materials and normally lubricated machined surfaces.

#### **Finishes**

Finish exposed piping, including fittings and supports, as follows:

- In internal locations such as toilet and kitchen areas: Chrome plate copper piping with bright finish.
- Externally and steel piping and iron fittings internally: Paint.
- In concealed but accessible spaces (including cupboards and non-habitable enclosed spaces): Leave copper and plastic unpainted except for identification marking. Prime steel piping and iron fittings.

Valves: Finish valves to match connected piping.

#### **Marking and labelling**

Mark services and equipment to provide a ready means of identification.

- Locations exposed to weather: Provide durable materials.
- Pipes, conduits and ducts: Identify and label.

Consistency: Label and mark equipment using a consistent scheme across all services elements of the project.

### **2.4 HOT AND COLD WATER SERVICES**

#### **Fittings and accessories**

Provide the fittings necessary for the proper functioning of the water supply system, including taps, valves, backflow prevention devices, temperature control devices, strainers.

#### **Line strainers**

Type: Low resistance, Y-form bronze bodied type, with screen of dezincification resistant brass, stainless steel or monel.

Screen perforations: 0.8 mm maximum.

#### **Piping insulation**

Application: Fit insulation tightly to piping surfaces without gaps. Minimise number of joints. Insulate fittings for the same thermal resistance as the piping insulation. Install the insulation on unions and other items requiring service so that it is readily removable. Provide supports formed to fit around the insulation so the insulation thickness is reduced by < 10%.

Material: Select from the following:

- Polyester in moulded tubular sections faced with factory bonded aluminium foil laminate or integral polyester scrim.
- Polyolefin foam: Cross linked closed cell polyolefin foam faced with factory bonded aluminium foil laminate.

#### **Tapware**

Provide the tapware in accordance with the **drawings or as appropriate**.

Metal heads and handles: Provide brass fittings or suitably bush to prevent electrolysis and growth.

Plastic heads and handles: Provide break-resistant fittings of a compact nature, to prevent fracture and exposure of jagged or rough edges.

Tap positions: Locate hot tap to the left of or above, the cold tap.

#### **Thermostatic mixing valves**

Water temperature regulated by a single hand control, capable of delivering water at the temperature of either of the supply systems and at any temperature in between and suitable for controlling single or multiple outlets, as appropriate.

Controls: Incorporate the following:

- A temperature sensitive automatic control which maintains temperature at the pre-selected setting and rapidly shuts down the flow if either supply system fails or if the normal discharge water temperature is exceeded.



## 2.5 WATER HEATERS

### Standard electric systems

Provide standard electrical water boilers as identified in the BOQ to locations identified on the drawings.

### Solar water systems

Provide a proprietary automatic water heater comprising solar collector and storage container, with or without supplementary heating unit and including connections, controls and necessary fittings.

## 2.6 HOSE REELS

### General

Provide hose reels with swivel hose guides in accordance with the **Drawings**.

## 2.7 STORMWATER

### Cleaning

During construction, use temporary covers to openings and keep the system free of debris.

### Downpipe connections

Turn up underground drainage pipelines to finish 50 mm above finished ground or pavement level.

### Access Pits

Cover levels: Locate the top of covers or gratings, including frames as follows:

- In paved areas: Flush with the paving surface.
- In landscaped areas: 25 mm above finished surface.

### Stormwater drains

Provide stormwater drains to connect downpipes, surface drains, subsoil drains and drainage pits to the outlet point or discharge point.

Downpipe connections: Turn up underground drainage pipelines with bends to meet the downpipe, finishing 50 mm (nominal) above finished ground or pavement level. Seal joints between downpipes and drains. Alternatively, terminate downpipe minimum of 100mm above adjacent ground level and discharge water to surface run off area. Allow for scour protection to bottom of downpipe.

### Lined surface drains-grated trenches

Provide precast or cast in situ concrete lined trenches with painted or galvanized steel gratings.

## 2.8 SUBSOIL DRAINS

### General

Provide subsoil drains to intercept groundwater seepage and prevent water build-up behind walls and under floors and pavements. Connect subsoil drains to surface drains or to the stormwater drainage system as applicable.

Connection: Connect subsoil drains to the stormwater drainage system.

Filters: UV resistant geotextile material with a permeability  $\geq 10$  times that of the native soil and capable of retaining particles of 0.25 mm size. Securely fit or join the sock at each joint.

Subsoil drains: Provide proprietary perforated plastic pipe.

## 2.9 SANITARY PLUMBING AND DRAINAGE

### Vent pipes

Staying to roof: If fixings for stays penetrate the roof covering, seal the penetrations and make watertight.

Terminations: Provide bird-proof vent cowls of the same material and colour as the vent pipe.

### Sanitary fixtures

Provide sanitary fixtures required, complete with all accessories necessary for correct installation and use.

## 2.10 COMPLETION

### Testing

Hydrostatic tests: Do not install insulation until the piping has been tested. Pressure test cold and hot water services to ensure that all pipework is free from leaks. Include pipe joints, valve seats, tap washers and strainers. Repair as necessary, replace if damaged and retest.

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**Completion**

Hot and cold water services: On completion, flush pipelines using water and leave them clean.

Stormwater and wastewater services: On completion, flush the system using water and leave clean.

**Charging**

On completion of installation, commissioning, and testing, fill the hot and cold water systems with water, turn on control and isolating valves and the energy supply and leave the water supply system in full operational condition.

**Operation and maintenance manuals**

Provide written operating and maintenance instructions containing:

- Contractor's contact details for service calls.
- Manufacturer's maintenance and operation literature.
- Description of day-to-day operation.

**Record drawings**

Provide a drawing of the system as installed. Show dimensions, types and location of the services in relation to permanent site features and other underground services. Include all changes made during commissioning and the maintenance period.

Diagrams: Include diagrammatic drawings of each system.

Services below ground: Where pipes and fittings are below ground show the depth and dimensioned references that will allow the future location of the service for maintenance or

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**9 ENVIRONMENTAL MANAGEMENT****9.1 PROTECTION OF ENVIRONMENT**

The contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

During continuance of the contract, the contractor shall abide at all times by all existing enactments on environmental protection and rules made thereunder, regulations, notifications and bye-laws of the Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by Government or the local authority.

**9.2 PREVENTION AND CONTROL OF WATER POLLUTION****9.2.1 Contamination of Ground and Surface Water**

The contractor shall take all necessary precautions for the prevention and control of pollution of the ground and surface water from oil and waste oil spills, sanitary facilities, construction wastes, paints and any other chemicals used in the construction.

**9.2.2 Drainage and Flood Control**

Contractor shall take all necessary precautions to prevent the blockage of water flow from the construction materials like earth, stone, or appendage.

Stagnation of water within or outside the project area from the project activities should be avoided to prevent mosquito breeding and other vector borne diseases

**9.2.3 Siltation of Water Bodies and Degradation of Water Quality**

The Contractor will not excavate beds of any stream/canals/ any other water body for borrowing earth. The contractor shall ensure that construction materials containing fine particles are stored in an enclosure such that sediment-laden water does not drain into nearby water course.

**9.2 PREVENTION AND CONTROL OF AIR POLLUTION****9.2.1 Transportation of Construction Materials**

All vehicles delivering fine materials to the site shall be covered to avoid spillage of materials and dust generation. Photographic record of this activity should be maintained.

**9.2.2 Vehicles, Equipment and Machinery**

All vehicles, equipment and machinery to be used in the project should have pollution control equipment such as exhaust dispersion systems and silencers.

**9.2.3 Dust Generation from Construction Site**

Dust generation from the construction site should be minimized by Sprinkling water on the stock piles of wastes before loading for disposal and by covering the materials containing fine particles during the high winds

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## **9.3 PREVENTION AND CONTROL OF NOISE POLLUTION**

The quieter equipments available in the market shall be used in the Project. Diesel Generator Sets having acoustic enclosures shall be used for the project.

## **9.4 PREVENTION AND CONTROL OF SOIL POLLUTION**

### **9.4.1 Control of Oil Spills**

Contractor shall not carryout any vehicle/machinery maintenance on site to avoid contamination of ground. If the emergency maintenance is to be carried on site, proper collection and disposal systems should be arranged before carrying out the maintenance. In such cases the contractor should arrange for collection, storage and disposal of oil wastes generated during the emergency maintenance to the nearest work shop for further handling.

Contractor shall not dispose diesel, lubes, paints and any other materials on site which may contaminate the soil.

### **9.4.1 Demolition of Existing Structures**

The contractor must recover all reusable materials generated from the demolition of the existing structures. All the reusable materials shall be reused in the project and unsuitable materials shall be disposed of as detailed in section 9.4.3.

### **9.4.2 Site Clearing**

Topsoil generated from the clearing shall be preserved and reused in the landscaping of the project areas or can be spread in the borrow areas or disposed as directed by the Project Manager of UNOPS or his/her representative.

The contractor shall take reasonable precautions to minimize disturbance to the native flora during the construction.

### **9.4.3 Collection and Disposal of Solid Waste**

The contractor shall develop a waste management plan within one week on arrival at site and the same shall be submitted to the Project Manager of the UNOPS or his/her representative. The contractor shall implement the waste management plan throughout the life of the Contract.

The plan should include collection, storage, transportation and disposal of wastes generated from all activities of the project. The following guidelines may be used for the safe solid waste management.

- ✓ Re usable materials should be used in the project as far as possible.
- ✓ Biodegradable materials shall be disposed in compost pits/ disposed away from the habitations
- ✓ Non biodegradable and non hazardous materials shall not be disposed on site and shall be disposed in a pit away from the habitation
- ✓ Deposit all indicated recyclable materials in the containers in a clean (no mud, adhesives, solvents, petroleum contamination), debris-free condition. Do not deposit contaminated materials into the containers until such time as such materials have been cleaned.

## **9.5 CONSTRUCTION MATERIALS**

### **9.5.1 Construction Water**

The contractor can use ground water/surface water as a source of water for the construction and he may set up own bore well facility for construction work or can take water from existing sources with written consent from owner of the bore well.

To avoid disruption/disturbance to other water users, the contractor will extract water from fixed location and details of the bore well will be recorded and filed.

If the new bore hole is created for the project water requirement, it should be left for the public use

### **9.5.2 Coarse and Fine Aggregates**

The contractor shall procure coarse and fine aggregates from the legal suppliers. The Contractor should obtain receipts of the purchase of materials and file copies of these receipts.

### **9.5.3 Soil**

Deep borrow areas shall not be created for the project. Depth of the borrow area shall be limited to 60 cm. Top soil removed and preserved from the borrow area shall be spread after completion of borrowing of soil. The waste materials generated from the excavation should be disposed in borrow areas created for the project, if they are not suitable for the filling.

### **9.5.4 Wood**

Wood/timber shall be obtained from the licensed suppliers and the receipt of purchase of wood/timber should be recorded.

## **9.6 HAZARDOUS WASTE**

All the hazardous wastes shall be disposed of as specified by the supplier

## **9.7 CLEANING OPERATION**

On the completion of the construction, the contractor shall remove all waste materials and excess materials from the site to the satisfaction of the Project Manager of UNOPS or his/her representative.

## **9.8 PREVENTION AND CONTROL OF SPREAD OF COMMUNICABLE DISEASES, PARTICULARLY HIV/AIDS**

The contractor shall provide HIV/AIDS/STDs awareness training to all the workers of the project. The contractor shall also provide strict guidelines regarding contact with local residences and enforce there guidelines.

## **9.9 CONSTRUCTION CAMP / SECURITY ROOM**

The contractor shall provide proper water supply, cooking facilities, sanitation and solid waste collection and disposal systems to the construction camp / security room. The contractor shall preferably use unskilled labor drawn from local communities to give the maximum benefit to the local community to avoid impacts on the local environment

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The contractor shall set the guidelines prohibiting poaching and collection of plants/wood with meaningful consequences for violation such as termination of the employment.

## **9.10 REPORTING**

The contractor shall submit solid waste management plan. This plan shall include collection, storage and disposal of solid waste generated from the Project.

The contractor should submit a completion report on the environmental management practices adopted on the completion of all site activities. This completion report shall include details of the difficulties faced and methods followed for overcoming these difficulties. The completion report should include photographic records and copies of agreements and receipts for materials.

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## **10 SAFETY MANAGEMENT**

### **10.1 CONSTRUCTION SAFETY**

The contractor shall take all necessary steps to provide safety for project workers, the persons residing near the project, to the property of the public or others from the project activities arising as a consequence of his methods of operation.

The Contractor shall comply with all Safety Legislations and its Subsidiary Legislations, Regulations which are in force in the Country and any amendments or re-enactments.

The Contractor shall not permit any person to do anything not in accordance with the generally accepted principles of safe and sound practices. The Contractor shall ensure safe environment on site at all times. The Contractor shall ensure that necessary and sufficient precautions are taken by his workmen when safety provisions are used.

### **10.2 BARRICADING**

The Contractor shall provide and maintain guards, fences or barriers around excavations, pits or other similar potential places of danger to prevent accidents. The barricade should be at least 1.1m high and strong enough to withstand a lateral point load of 50 kg.

### **10.3 WARNING SIGNS**

The Contractor shall display warning signs of sizes 900 mm x 600 mm at a minimum of 4 points around the periphery of the site where the construction activities are located in near the residential area, roads, at locations where there is a chance of children can come to work site and where trespassing is likely to occur. Such signs shall have the words "DANGER - KEEP OUT OF SITE"

### **10.4 STORAGE OF FUELS**

Fuels shall be stored in a room/ enclosed space, the room/ enclosed space shall have impervious platform and berm along the periphery of the storage area to contain spills of the fuels.

### **10.5 SAFETY OF MACHINERY**

The Contractor shall employ only qualified operators for the machinery to be used on Site. All the machinery shall be locked when they are parked to avoid unauthorized operation of the machinery.

### **10.6 FIRST AID**

At least two first aid kits shall be kept at site for attending the emergency treatment to the victims of accidents or chemical poisoning or excessive exposure to toxic substances. The first aid kit shall include a leaflet of standard First-Aid procedure in addition to the medicines and medical tools. At least one staff member who has undergone First Aid training should be posted at site.

### **10.7 FIRE SAFETY, EMERGENCY AND RESCUE**

The Contractor shall establish Fire Safety, Emergency and Rescue arrangements to contain fire and take necessary action during emergency. The contractor should place fire extinguishers at the work site, materials storage area and at site accommodation. The contractor should keep minimum 6 fire extinguishers within the work place.

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### **10.8 ELECTRICAL SAFETY**

All electrical equipment should be listed and labeled, free from hazards, and used in the proper manner. The electrician should be protected from electrical shocks and provided necessary safety equipment

All temporary electrical installations in the site should be verified regularly to ensure that all the leaks in the wires are rectified/ faulty wires are replaced. The contractor should also ensure that all electric joints are leak proof.

### **10.9 PERSONAL PROTECTIVE EQUIPMENT**

The Contractor shall provide and maintain suitable personal protective equipment for all workmen employed on the site to provide protection against falling objects and harmful substances which can cause injury. The Personal protective equipment shall include boots, hand gloves, helmet and goggles. The Contractor shall record the issuance of all equipment to his workmen and kept in the site office.

### **10.10 HOUSEKEEPING**

The Contractor shall provide safe working environment by keeping the site neat and tidy, and free from debris. All materials shall be stacked safely. All accesses shall be kept free from hazards and debris.

Housekeeping shall be carried out in such a manner and at such times so as not to cause any inconvenience to either the adjoining owners, occupiers or the public. Debris shall be wetted to minimize the risk of dust. Containers for debris, rubbish and other wastes shall be provided at the designated places.

**AUTHORITY OF SIGNATORY**

**SECRETARY'S CERTIFICATE**

I, \_\_\_\_\_, a duly elected and qualified Corporate Secretary of \_\_\_\_\_, a corporation duly organized and existing under and by virtue of the law of the \_\_\_\_\_, DO HEREBY CERTIFY, that:

I am familiar with the facts herein certified and duly authorized to certify the same;

At the regular meeting of the Board of Directors of the said Corporation duly convened and held on \_\_\_\_\_ at which meeting a quorum was present and acting throughout, the following resolutions were approved, and the same have not been annulled, revoked and amended in any way whatever and are in full force and effect on the date hereof:

RESOLVED, that \_\_\_\_\_ be, as it hereby is, authorized to participate in the bidding of \_\_\_\_\_ Project ID-No. \_\_\_\_\_ by the \_\_\_\_\_; and that if awarded the project shall enter into a contract with the \_\_\_\_\_; and in connection therewith hereby appoint \_\_\_\_\_, acting as duly authorized and designated representatives of \_\_\_\_\_, are granted full power and authority to do, execute and perform any and all acts necessary and/or to represent \_\_\_\_\_ in the bidding as fully and effectively as the \_\_\_\_\_ might do if personally present with full power of substitution and revocation and hereby satisfying and confirming all that my said representative shall lawfully do or cause to be done by virtue hereof;

RESOLVED FURTHER THAT, the \_\_\_\_\_ hereby authorizes its President to:

- (1) execute a waiver of jurisdiction whereby the \_\_\_\_\_ hereby submits itself to the jurisdiction of he Philippine government and hereby waives its right to question the jurisdiction of the Philippine courts;
- (2) execute a waiver that the \_\_\_\_\_ shall not seek and obtain writ of injunctions or prohibition or restraining order against the AFP or any other agency in connection with this project to prevent and restrain the bidding procedures related thereto, the negotiating of and award of a contract to a successful bidder, and the carrying out of the awarded contract.

WITNESS the signature of the undersigned as such officer of the said \_\_\_\_\_ this \_\_\_\_\_.

\_\_\_\_\_  
(Corporate Secretary)

**ACKNOWLEDGMENT**

SUBSCRIBED AND SWORN to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ affiant exhibited to me his/her Community Tax Certificate No. \_\_\_\_\_ issued on \_\_\_\_\_ at \_\_\_\_\_, Philippines.

Notary Public  
Until 31 December 20\_\_\_\_  
PTR No. \_\_\_\_\_  
Issued at: \_\_\_\_\_  
Issued on: \_\_\_\_\_  
TIN No. \_\_\_\_\_

Doc. No. \_\_\_\_\_  
Page No. \_\_\_\_\_  
Book No. \_\_\_\_\_  
Series of \_\_\_\_\_.



# Bid Form for the Procurement of Infrastructure Projects

*[shall be submitted with the Bid]*

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## BID FORM

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

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

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 a period stated in the PBDs, and it shall remain binding upon us at any time before the expiration of that period;
- g. If our Bid is accepted, we commit to obtain a Performance Security in the amount of *[insert percentage amount]* percent of the Contract Price for the due performance of the Contract, or a Performance Securing Declaration in lieu of the the allowable forms of Performance Security, subject to the terms and conditions of issued GPPB guidelines<sup>1</sup> for this purpose;
- h. We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Documents;
- i. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed; and
- j. We understand that you are not bound to accept the Lowest Calculated Bid or any other Bid that you may receive.
- k. We likewise certify/confirm that the undersigned, is the duly authorized

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<sup>1</sup> currently based on GPPB Resolution No. 09-2020

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].

- I. 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: \_\_\_\_\_

## **Bid Securing Declaration Form**

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

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

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

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

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid Securing Declaration.
2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by the procuring entity for the commission of acts resulting to the enforcement of the bid securing declaration under Sections 23.1(b), 34.2, 40.1 and 69.1, except 69.1(f), of the IRR of RA No. 9184; without prejudice to other legal action the government may undertake.
3. I/We understand that this Bid Securing Declaration shall cease to be valid on the following circumstances:
  - a. Upon expiration of the bid validity period, or any extension 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]*

## Omnibus Sworn Statement (Revised)

*[shall be submitted with the Bid]*

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

### AFFIDAVIT

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

*[Insert signatory's legal capacity]*

Affiant

**[Jurat]**

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

# 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]*

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## CONTRACT AGREEMENT

THIS AGREEMENT, made this *[insert date]* day of *[insert month]*, *[insert year]* between *[name and address of PROCURING ENTITY]* (hereinafter called the "Entity") and *[name and address of Contractor]* (hereinafter called 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 hereinafter 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 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. Winning 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 that additional contract documents or information prescribed by the GPPB that are subsequently required for submission after the contract execution, such as the Notice to Proceed, Variation Orders, and Warranty Security, shall likewise form part of the Contract.**

3. In consideration for the sum of *[total contract 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 *[Name of the procuring entity]* agrees to pay the above-mentioned sum in accordance with the terms of the Bidding.

IN WITNESS whereof the parties thereto have caused this Agreement to be executed the day and year first before written.

*[Insert Name and Signature]*

*[Insert Name and Signature]*

*[Insert Signatory's Legal Capacity]*

*[Insert Signatory's Legal Capacity]*

for:

for:

*[Insert Procuring Entity]*

*[Insert Name of Supplier]*

**Acknowledgment**

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

**Price Schedule for Goods Offered from Abroad**  
*[shall be submitted with the Bid if bidder is offering goods from Abroad]*

**For Goods Offered from Abroad**

Name of Bidder \_\_\_\_\_ Project ID No. \_\_\_\_\_ Page \_\_\_\_ of \_\_\_\_

1	2	3	4	5	6	7	8	9
Item	Description	Country of origin	Quantity	Unit price CIF port of entry (specify port) or CIP named place  (specify border point or place of destination)	Total CIF or CIP price per item  (col. 4 x 5)	Unit Price Delivered Duty Unpaid (DDU)	Unit price Delivered Duty Paid (DDP)	Total Price delivered DDP (col 4 x 8)

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

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

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

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



**Price Schedule for Goods Offered from Within the Philippines**  
*[shall be submitted with the Bid if bidder is offering goods from within the Philippines]*

**For Goods Offered from Within the Philippines**

Name of Bidder \_\_\_\_\_ Project ID No. \_\_\_\_\_ Page \_\_\_ of \_\_\_

1	2	3	4	5	6	7	8	9	10
Item	Description	Country of origin	Quantity	Unit price EXW per item	Transportation and all other costs incidental to delivery, per item	Sales and other taxes payable if Contract is awarded, per item	Cost of Incidental Services, if applicable, per item	Total Price, per unit  (col 5+6+7+8)	Total Price delivered Final Destination  (col 9) x (col 4)

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

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

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

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