

REPUBLIC OF THE UNION OF MYANMAR

**MINISTRY OF TRANSPORT and COMMUNICATIONS
DIRECTORATE OF WATER RESOURCES AND IMPROVEMENT
OF RIVER SYSTEMS (DWIR)**

**AYEYARWADY INTEGRATED RIVER BASIN
MANAGEMENT PROJECT (AIRBMP)
PROJECT MANAGEMENT UNIT (PMU)**

**BIDDING DOCUMENT FOR WORKS
FOR
PMU BUILDING**

Project: Ayeyarwady Integrated River Basin Management
(AIRBM) Project

Employer: Directorate of Water Resources and Improvement of
River Systems (DWIR), Project Management Unit
(PMU)

Country: Myanmar

Description of works: Construction of PMU Building

Reference No.: CW1.1.1

Issued on: 14 August 2017

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INVITATION TO BID

DIRECTORATE OF WATER RESOURCES AND IMPROVEMENT OF RIVER SYSREM (DWIR), AIRBM PROJECT – PROJECT MANAGEMENT UNIT (PMU)

Wishes to engage a contractor to implement the following Project:

CW1.1.1- PMU Building Construction

1. The *Government of Myanmar (GoM)* has received a *Credit* from the International Development Association toward the cost of **Ayeyarwady Integrated River Basin Management (AIRBM) Project**, and it intends to apply part of the proceeds of this *Credit* to payments under the Contract for **CW1.1.1 – PMU Building Construction**.
3. Construction will begin on *1 November 2017* and will be completed by end of *June 2018*. Interested qualified eligible contractors are invited to request a copy of the bidding documents free of charge.
4. To be considered eligible a contractor must:
 - a. Not be under any notice of debarment issued by the World Bank
 - b. Not be declared bankrupt or insolvent by a competent authority
 - c. To be an officially registered firm.
5. To be considered qualified a contractor must
 - a. Have completed within the last 5 years at least three contracts of a similar nature of at least 50% of the value of the bid
 - b. The proposed works manager must at least 5 years of experience in works of an equivalent nature and volume and no less than three years as a manager.
 - c. Must demonstrate to have or plan to acquire plant and equipment required for the work
 - d. Must demonstrate to have adequate funds or access to funds (letter from bank) to demonstrate that he has funds to finance at least one month cashflow required for the project (bid price divided by period of construction method)

Documentary evidence to demonstrate the bidder's qualifications must be submitted with the bid.

6. Bids must be delivered to the address given below at or before **14:00 on 19 September 2017**. Late bids will be rejected. Bids will be opened in public immediately thereafter at the same address in the presence of the Bidders' representatives and the project's beneficiaries from the concerned local community who choose to attend shall be allowed to be present in person.

7. The Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.
8. All bids must be accompanied by a bid securing declaration as described in the bidding documents, any bid not accompanied by one will be rejected as non-responsive.
9. The address where the document may be inspected and obtained is:
Attn: Mr. Aung Min or Ms. Ei Kyipyar Soe, Procurement Officers
No.400, DWIR Compound, PMU Office (Building (7)), Lower Pazuntaung Road, Postal Code 11171, Pazuntaung Township, Yangon Myanmar

Tel: or + 95 95058307 or +95 9263657191
E-mail: aungminaung1977@gmail.com with a copy to dwir.airbm@gmail.com; component3director@gmail.com; eikyipyarsoe@gmail.com
10. In case of any difficulty in obtaining the bidding documents, interested parties may contact in writing:
Mr. Win Hlaing, PMU Director
PMU Office, No.400, DWIR Compound, Building (7), Lower Pazuntaung Road, Pazuntaung Township, Postal Code: 11171, Yangon, Myanmar
Telephone: +95 92013271, Email: dwir.airbm@gmail.com
11. The address for bid submission and bid opening is:
Mr. Aung Min or Ms. Ei Kyipyar, National Procurement Officers, AIRBM Project, PMU Office, No.400, DWIR Compound, Building (7) (PMU Office), Lower Pazuntaung Road, Pazuntaung Township, Postal Code: 11171, Yangon, Myanmar.
12. The GoM and the World Bank will respectively declare a firm ineligible either indefinitely or for a stated period of time, to be awarded a contract funded by the GoM and the World Bank, if it at any time determines that the firm has engaged in corrupt or fraudulent, coercive or collusive practices in competing for or in executing a contract. It is the World Bank's policy to require you to observe the highest standard of ethics during the procurement as the provisions on fraud and corruption specified in Attachment.

SECTION 1- INSTRUCTIONS TO BIDDERS

1. **Description of Works:** Directorate of Water Resources and Improvement of River System (DWIR), AIRBM project – Project Implementation Unit (PMU), as the Employer, invites bids for the construction of PMU Building: an office building for the PMU within DWIR Yangon compound as described in the Conditions of Contract (CC). The successful contractor will be expected to construct the works within the time allowed under the Conditions of Contract.
2. **Eligibility of Bidders:** Only bidders who meet the following criteria will be eligible for an award of contract:
 - a. Not be under any notice of debarment issued by the World Bank
 - b. Not be declared bankrupt or insolvent by a competent authority
 - c. To be an officially registered firm.
3. **Qualification of the Bidder:** Only bidders who meet the following criteria will be qualified for an award of contract:
 - a. Have completed within the last 5 years at least three contracts of a similar nature of at least 50% of the value of the bid
 - b. The proposed works manager must at least 5 years of experience in works of an equivalent nature and volume and no less than three years as a manager.
 - c. Must demonstrate to have or plan to acquire plant and equipment required for the work
 - d. Must demonstrate to have adequate funds or access to funds (letter from bank) to demonstrate that he has funds to finance at least one month cashflow required for the project (bid price divided by period of construction method)

Documentary evidence to demonstrate the bidder's qualifications must be submitted with the bid.

4. **Fraud and Corruption.** The World Bank requires that Borrowers or Recipients (including beneficiaries of the funds), as well as bidders, suppliers, contractors and consultants observe the highest standard of ethics during the procurement and execution of contracts as specified in the Attachment. All bidders are required to complete the Statement on Ethical Conduct and Fraud and Corruption provided in and submit it with their bid.
5. **Contents of Bid Documents:** The set of Bid documents comprises the documents listed below:

Invitation to Bid
SECTION 1: INSTRUCTIONS TO BIDDERS
SECTION 2: CONDITIONS OF CONTRACT (CC)
SECTION 3: BILL OF QUANTITIES (For Reference Only)
SECTION 4: TECHNICAL SPECIFICATIONS AND DRAWINGS
SECTION 5: FORM OF BID
SECTION 6: ACTIVITY SCHEDULE
SECTION 7: FORM OF CONTRACT AGREEMENT
SECTION 8: BID AND PERFORMANCE SECURING
DECLARATION

6. Prices and Currency of Bids:

- a. Rates and prices shall be quoted in US Dollars for all Activities of Works described in the Activity Schedule, and Activities for which no rate has been quoted will not be covered by the other rates in the Activity Schedule.
- b. All duties, taxes, and other levies paid or payable by the Contractor under the Contract, or for any other cause shall be included in the rates, prices, and total bid price submitted by the Bidder.
- c. Prices shall remain fixed and not subject to price adjustment during the period of performance of the contract.

7. Documents Comprising the Bid: The Bid submitted by the Contractor shall comprise the following documents:

- Form of Bid
- Priced Activity Schedule
- Priced Bill of Quantities (for reference purposes only)
- Bid and Performance Securing Declaration
- Documents to demonstrate eligibility and qualification of the Bidder
- Written confirmation authorizing the signatory of the Bid to commit the Bidder

8. Bid and Evaluation Criteria: The bid and the Contract shall be for the whole Works, including materials, equipment, labor, transport and profit. The Employer shall award the contract to the Bidder whose bid has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Documents, provided further that the bidder is determined to be qualified to perform the contract satisfactorily

9. Validity of Bid. The bid shall remain valid for the period of ninety (90) calendar days counted from the deadline for submission of bids specified in Paragraph 12 of these Instructions. The Employer may request Bidders to extend the period of validity for a specified additional period. The Employer's request and the Bidders' responses shall be made in writing or by fax or by email. A Bidder may refuse the request for extension of bid validity in which case he may withdraw his Bid without any penalty. A Bidder agreeing to the request will not be required or permitted to otherwise modify its Bid.

10. Language of the Bid: All documents relating to the Bid and contract shall be in the English language.

11. Preparation and Sealing of Bid: The Bidder shall prepare one original of the documents comprising the Bid as described in Paragraph 7 of these Instructions, with the Form of Bid, and clearly marked "Original". In addition, the Bidder shall also submit one copy which shall be clearly marked as "COPY". In the event of discrepancy between them the original shall prevail. The original and the copy of the Bid shall be signed by a person or persons duly authorized to sign on behalf of the Bidder. All the pages of the Bid where entries or amendments or corrections have been made shall be initialed by the person or persons signing the Bid. The Bidder

shall seal the original and the copy of the Bid in two inner envelopes and one outer envelope, duly marking the inner envelopes as “ORIGINAL” and “COPY”. The inner and the outer envelopes shall be addressed to the Employer at the address provided in the Invitation to Bid shall provide a warning not to open before the specified time and date for Bid opening as defined paragraph 15 of these Instructions. The inner envelopes shall indicate the name and full address of the Bidder. If the outer envelope is not sealed and marked as above, the Purchaser will assume no responsibility for the misplacement or premature opening of the Bid.

12. **Place and Deadline for Submission of Bids:** The Bids shall be delivered to the Employer NO LATER than **14:00** on **19 September 2017** at the address:

Ms. Ei Kyipyar Soe or Mr. Aung Min, National Procurement Officers, AIRBM Project, PMU Office,
No.400, DWIR Compound, Building (7) (PMU Office), Lower Pazuntaung Road, Pazuntaung Township, Postal Code: 11171, Yangon, Myanmar.

Any Bid received by the Employer after the deadline prescribed in this clause will be returned unopened to the Bidder.

13. **Bid and Performance Securing Declaration:** The Bid and Performance Securing Declaration should be in accordance with the form included in Section 7: Bid and Performance securing declaration shall be valid up to the end of the guarantee period specified in para. 20 of CC. Any Bid not accompanied by a Bid and Performance Securing Declaration when required will be rejected by the Employer as non-responsive. The execution of a bid securing declaration will result in the Bidder being held ineligible for all contracts let by the GoM irrespective of the funding source for a period of two years from the expiry of the Bid Validity unless, at a Bidder’s option, the Bidder pays an administrative penalty of two percent of the total amount bid to the Employer. The Bid Securing and Performance Declaration will be executed:

- (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Bid Form or
- (b) if the Bidder does not accept the correction of its Bid Price pursuant to paragraph 17 of these Instructions.
- (c) if the successful Bidder fails within the specified time to sign the Contract:
- (d) if the successful bidder, once contracted commits a fundamental breach of contract leading to the Employer’s termination of the contract for reasons of the successful bidder’s default.

14. **Modification and Withdrawal of Bids:** No Bids shall be modified after the deadline for submission of Bids specified above in paragraph 12 of these Instructions. Withdrawal of a Bid between the deadline for submission of Bids and the expiration of the validity of the Bids as specified in paragraph 9 of these Instructions above will result in the execution of the Bid Securing and Performance Declaration.

15. **Opening of Bids:** The Employer will open the Bids in the presence of the bidders’ representatives and representatives of the project’s beneficiaries from the local community who choose to attend, immediately after the deadline for submission of bids and at the same address specified in paragraph 12 of these Instructions. The bidders’ names, the total amount of each Bid, unconditional discounts if any, and the

present/absence of bid securing and performance declarations will be announced by the Employer at the Bid opening. The written record of public opening shall be signed in original by all those present. Immediately upon conclusion of the bid opening proceedings, copies of the minutes shall be provided to the bidders and community representatives present at the bid opening. In addition, a copy of the minutes shall promptly be posted at a prominent and freely accessible location outside the office of the Employer, and also sent to all those who submitted their bids but were not present at the bid opening.

16. **Process to be Confidential:** Any information relating to the examination, clarification, evaluation and comparison of bids for the contract award shall not be disclosed until the award to the successful Bidder has been announced.
17. **Evaluation and Comparison of Bids:** The Employer will award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the Bid documents and who has offered the lowest evaluated Bid and has been determined to be qualified to perform the Contract satisfactorily. In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid by adjusting the Bid by making any correction for any arithmetic errors as follows:
 - a) where there is a discrepancy between amounts in figures and in words, the amount in words will govern;
 - b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern;

If a Contractor refuses to accept the correction, his Bid will be rejected and Bid Securing and Performance Declaration executed.

If no rate has been quoted for any of the activities, for evaluation purpose, average of the rates quoted by the other contractors for that activity will be used.

18. **Employer's Right to Accept Any Bids and to Reject any or all Bids:** The Employer reserves the right to accept or reject any bid, and to cancel the process of competition and reject all bids, at any time prior to the award of the Contract, without thereby incurring any liability to the affected Contractor(s).
19. **Notification of Award and Signing of Contract:** The Contractor whose Bid has been accepted will be notified of the award by the Employer prior to the expiration of the validity period of the Bid, by registered letter. The written notification of award will constitute the formation of the Contract.
20. **Debriefing.** After the award of contract has been announced an unsuccessful bidder has the right to request a debriefing to ascertain why its bid was unsuccessful and the Employer the obligation to provide it.

21. Complaints

- 21.1 A complaint may be made by any party at any stage of the procurement process. No complaint will be responded to during the evaluation period. Complaints received during the evaluation period will be reviewed by the Purchaser and a response issued only after the evaluation is completed. Complaints shall be addressed to the

designated representative of the Employer Mr. Win Hlaing, PMU Director PMU Office, No.400, DWIR Compound, Building (7), Lower Pazuntaung Road, Pazuntaung Township, Postal Code: 11171, Yangon, Myanmar, Telephone: +95 092013271, Email: dwir.airbm@gmail.com.

The designated representative of the Employer will investigate the grounds for the complaint and, with the exception of those complaints received during the evaluation period as described above, respond to in writing within 14 calendar days of receiving the complaint. In the event that the response from the designated representative of the Employer does not satisfy the bidder or there is no response to the complaint it should be referred to the Treasury Department, Ministry of Finance, Nay Pyi Taw, Myanmar. In such case, a copy of the complaint should also be sent to the representative of the World Bank Mr. Greg Browder, Task Team Leader, the World Bank, email: gbrowder@worldbank.org with a copy to Ms. Ana Nunez Sanchez, e-mail: anunezsanchez@worldbank.org . This is without prejudice to any other recourse that a bidder may choose under the laws of Myanmar.

22. Publication of Award.

The Employer shall

- (i) notify in writing all participating bidders of the results of the bid evaluation after the contract has been awarded, and
- (ii) publish in the Ministry's website and the bulletin board, at the end of each quarter, a notice informing the general public of the availability of contract awards summary and contract registers in the office of the Employer.

World Bank Policy - Corrupt and Fraudulent Practices

Guidelines for Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, dated January 2011.

“Fraud and Corruption:

1.16 It is the Bank’s policy to require that Borrowers (including beneficiaries of Bank loans), bidders, suppliers, contractors and their agents (whether declared or not), sub-contractors, sub-consultants, service providers or suppliers, and any personnel thereof, observe the highest standard of ethics during the procurement and execution of Bank-financed contracts.¹ In pursuance of this policy, the Bank:

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
 - (i) “corrupt practice” is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;²
 - (ii) “fraudulent practice” is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;³
 - (iii) “collusive practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;⁴
 - (iv) “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;⁵
 - (v) “obstructive practice” is:
 - (aa) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or

¹ In this context, any action to influence the procurement process or contract execution for undue advantage is improper.

² For the purpose of this sub-paragraph, “*another party*” refers to a public official acting in relation to the procurement process or contract execution. In this context, “*public official*” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

³ For the purpose of this sub-paragraph, “*party*” refers to a public official; the terms “*benefit*” and “*obligation*” relate to the procurement process or contract execution; and the “*act or omission*” is intended to influence the procurement process or contract execution.

⁴ For the purpose of this sub-paragraph, “*parties*” refers to participants in the procurement process (including public officials) attempting either themselves, or through another person or entity not participating in the procurement or selection process, to simulate competition or to establish bid prices at artificial, non-competitive levels, or are privy to each other’s bid prices or other conditions.

⁵ For the purpose of this sub-paragraph, “*party*” refers to a participant in the procurement process or contract execution.

threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or

(bb) acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under paragraph 1.16(e) below.

- (b) will reject a proposal for award if it determines that the bidder recommended for award, or any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;
- (c) will declare misprocurement and cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of the loan engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices during the procurement or the implementation of the contract in question, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;
- (d) will sanction a firm or individual, at any time, in accordance with the prevailing Bank's sanctions procedures,⁶ including by publicly declaring such firm or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded a Bank-financed contract; and (ii) to be a nominated⁷;
- (e) will require that a clause be included in bidding documents and in contracts financed by a Bank loan, requiring bidders, suppliers and contractors, and their sub-contractors, agents, personnel, consultants, service providers, or suppliers, to permit the Bank to inspect all accounts, records, and other documents relating to the submission of bids and contract performance, and to have them audited by auditors appointed by the Bank.”

⁶ A firm or individual may be declared ineligible to be awarded a Bank financed contract upon: (i) completion of the Bank's sanctions proceedings as per its sanctions procedures, including, inter alia, cross-debarment as agreed with other International Financial Institutions, including Multilateral Development Banks, and through the application the World Bank Group corporate administrative procurement sanctions procedures for fraud and corruption; and (ii) as a result of temporary suspension or early temporary suspension in connection with an ongoing sanctions proceeding. See footnote 14 and paragraph 8 of Appendix 1 of these Guidelines.

⁷ A nominated sub-contractor, consultant, manufacturer or supplier, or service provider (different names are used depending on the particular bidding document) is one which has either been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that allow the bidder to meet the qualification requirements for the particular bid; or (ii) appointed by the Borrower.

SECTION 2. CONDITIONS OF CONTRACT (CC)

Article 1 General Provisions

1. The Employer has appointed **Mr. Aung Myo Khaing**, Component 3 Director (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) to be the Project Manager who will supervise implementation of the contract. The Project Manager may delegate any of his duties and responsibilities to other people, after notifying the Contractor,
2. The Contractor confirms that he has examined, read and understood fully all the Contract Documents, being
 - (a) The Form of Bid submitted by the Contractor,
 - (b) the Priced Activity Schedule,
 - (c) the Form of Contract,
 - (d) the Conditions of Contract,
 - (e) the Contractor's Priced Bill of Quantities (to be used only in the determination of price of additional Works, if any, approved by the Project Manager),
 - (f) the Drawings and
 - (g) the Technical Specificationstogether form the Contract
3. The Employer has approved the Activity Schedule in the bid submitted by the Contractor and the person representing the Contractor, who will act as **Works Manager**.
4. The law governing the Contract shall be the laws of Myanmar and the language of the Contract shall be English unless otherwise stated in the Contract
5. The Contract shall be amended only by written agreement between the Employer and the Contractor
6. Every effort shall be made to resolve disputes amicably and without recourse or referral to third parties. Any dispute that cannot be resolved amicably shall be referred by either Party to the Myanmar Chamber of Commerce for adjudication in accordance with the under the Rules of Conciliation and Arbitration of the International Chamber of Commerce.

Article 2 Employer's and Contractor's obligations

7. The Employer and the Contractor now agree as follows:
 - 7.1 The Employer pledges to pay the Contractor the Lump-Sum Contract Price, (Insert amount in works and figures). This amount is for completion of the whole Works shown in the

Drawings and Technical Specifications, including materials, transport to the site, labor and profit.

- 7.2 The Contractor pledges to construct the following works: Construction of PMU Building in accordance with the Drawings and Technical Specifications.

Article 3 Conditions for Execution of the Works

8. The Contractor shall not sub-contract more than 25% of the whole of the works. The Contractor shall not, without the written consent of the Employer, sub-contract any part of the Works. In the event the Employer approves the sub-contracting, such consent shall not relieve the Contractor of his obligations under the Contract.
9. The Contractor shall start the Contract and implementation of the Works on the date two weeks after contract signing (Start Date) and shall complete the whole of the works not later than 8 months from *the Start Date*. If implementation of the Contract is delayed due to any circumstances or event, which could not have been foreseen by an experienced contractor, the Contractor must inform the Project Manager immediately about the delay. If the Project Manager considers that an extension of time for the Contract is justified, the Contractor must submit an amended Work Plan, agreed with the Project Manager, for approval by the Employer.
10. If, 15 days after the Start Date, the Contractor has not started to implement the project, the Employer has the right to cancel the contract. If, at any time, implementation of any part of the Works is delayed by more than 30 days beyond the dates shown in the Work Plan, the Employer has the right to terminate the contract. In either circumstances should the delays be attributable to a breach on the part of the Contractor the Employer will execute the Bid and Performance Securing Declaration.
11. The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts stated in the Contract Data for the following events which are due to the Contractor's risks:
 - (a) loss of or damage to the Works, Equipment, Plant and Materials;
 - (b) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and
 - (c) personal injury or death. Third party liability.

Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for approval within 15 days of receipt by the Contractor of the Employer's Letter of Acceptance.

12. The Employer will reduce the payment to the Contractor by 0.07% of the total price of the project for every day after the Completion Date shown in paragraph 8 of this CC or any amendment thereof, approved by the Employer until the work is complete. The reduction is up to a maximum of 10%, then after the Employer may terminate the contract.
13. The Contractor's Works Manager will be present on site all the time that work is in progress. The Works Manager will keep a Works Notebook to record progress of the work.
14. The Project Manager, or any other person named as a representative by the Employer and

notified to the Contractor, may inspect the work at any time. The Project Manager may instruct the Contractor to provide samples of materials for quality testing. The Project Manager may instruct the Contractor to dig inspection holes in completed sections of the work in order to allow inspection. The Contractor will cooperate with the Project Manager and allow the Project Manager to use the Contractor's staff and equipment as necessary to carry out inspections of the work.

15. All additional works undertaken on the instructions of the Project Manager for the purposes of inspection will be reimbursed at the rates shown in the Activity Schedule provided that such works inspected do not prove defective. Should the works prove defective all costs of inspection will be borne by the Contractor.
16. The Project Manager may issue instructions to the Contractor to ensure compliance with the Drawings and the Specification. The Project Manager may agree minor changes to the Drawings and the Specification, provided that these do not change substantially the final quantity and quality of the Works. The Project Manager may not instruct the Contractor to change the quantity of work shown in the Drawings, or to make any change that will substantially change the quality of the finished Works, without the written agreement of the Employer.
17. The Contractor's Work Plan shows stages of work that must be inspected and approved by the Project Manager. When these stages are reached the Contractor must not proceed further with the work until the Project Manager has given his approval. If the Contractor proceeds with the work without waiting for the Project Manager to inspect, so that the work to be inspected has been covered over, the Project Manager may instruct the Contractor to destroy that part of the work and construct again.
18. The Contractor agrees to ensure that the work is carried out in a safe manner and with the minimum disturbance to people living close to or passing by the site, or damage to the environment. The place of disposing of excavated earth, dirty water or other waste materials must be approved by the Employer before disposal starts. For that purpose, the Contractor shall prepare an Environmental Management Plan and submit to the Project Manager for Approval.
19. On completion of the works the contractor shall be responsible for removing all plant, surplus materials and wastes from the site and for restoring the site to a clean and tidy condition.
20. The contractor guarantees the work against defects or omissions for a period of 12 months, starting from the actual date of completion of the Works shown on the Progress Report issued by the Project Manager. The Contractor agrees to make good, at his own expense, any defect or omissions that appears during that time due to quality of materials or workmanship.
21. The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract. Notwithstanding the above, the Employer may terminate the Contract for convenience by giving the Contractor a thirty-day notice in writing
22. If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site within 15 days of the completion of the notice period.

23. If war or natural disaster makes completion of the contract impossible, the Contractor may ask the Employer to release him from the Contract. The Contractor may request payment for that part of the works that is complete and intact at the time the request for release is made.

Article 4 Payment Provisions

24. The Contractor shall provide updated Activity Schedules within 14 days of being instructed to by the Project Manager. The activities on the Activity Schedule shall be coordinated with the activities on the Program.
25. The Contractor shall show delivery of Materials to the Site separately on the Activity Schedule if payment for Materials on Site shall be made separately. *However, under this contract no separate payment will be made for the Materials.*
26. The Activity Schedule shall be amended by the Contractor to accommodate changes of Program or method of working made at the Contractor's own discretion. Prices in the Activity Schedule shall not be altered when the Contractor makes such changes to the Activity Schedule
27. When the Contractor wishes to apply for payment he must submit a written request for payment to the Employer. The Project Manager will then verify the quantity of work completed and will check that the quality of the materials used and the quality of the Contractor's workmanship is in accordance with the Contract. The Project Manager will also check that the construction is following the Drawings and any instructions given by the Project Manager to the Contractor, and that the conditions for release of payment have been met. The Project Manager shall then either:
- a. Issue a Progress Report (or Completion Report) certifying that the conditions for release of the payment have been met, or;
 - b. Issue a Progress Report detailing further work that must be done to meet the conditions for release of the payment.
28. The Employer shall retain seven percent from each payment due to the Contractor until Completion of the whole of the Works. On completion of the whole of the Works and obtaining occupation permissions from the relevant Government Authorities, half the total amount retained shall be repaid to the Contractor and half when the Guarantee Period has passed and the Project Manager has certified that all defects notified by the Project Manager to the Contractor before the end of this period have been corrected. On completion of the whole Works and obtaining occupation permissions from the relevant Government Authorities, the Contractor may substitute retention money with an "on demand" Bank guarantee valid for one calendar month beyond the expiry of the Guarantee Period
29. On receiving a Progress Report (or Completion Report) from the Project Manager, indicating that the conditions for release of any payment have been met, the Employer will issue a Payment Certificate.
30. Payments shall be made on a lump-sum basis upon fulfillment of the "payment conditions" as per the following Schedule:

Stages of Payment (1)	Amount of Lump Sum Payments (MMK) (2)	Payment Conditions <i>(Physical Stages of Works)</i> (3)
Payment No 1		Upon completion of Activity No. 1.1 as certified by the Project Manager (PM)
Payment No 2		Upon completion of Activity No. 2.1, 2.2, 2.3, 2.4, 2.5, 2.6 and 2.7 , as certified by the Project Manager (PM)
Payment No 3		Upon completion of Activity No. Upon completion of Activity No. 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.14, and 7.1 , as certified by the Project Manager (PM)
Payment No 4		Upon completion of Activity No. Upon completion of Activity No. 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 5.1, 5.2, 6.1, 7.2 and 7.5 , as certified by the Project Manager (PM)
Payment No 5		Upon completion of Activity No. 4.1, 4.2, 4.3, 4.4, 5.4, 5.5, 6.2, and 7.3 , as certified by the Project Manager (PM)
Payment No 6		Upon completion of Activity No. 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 8.1, 8.2, 8.3, and 8.4 , as certified by the Project Manager (PM)
Payment No 7		Upon completion of Activity No. 4.11, 4.12, 4.13, 5.3, 6.3, 7.4 and 7.6 , as certified by the Project Manager (PM)
Payment No 8 (final payment)		Upon completion of Activity No. 9.1, 9.2, 9.3, 9.4, 9.5, 9.6 and 9.7 and Completion of the whole Works in accordance with the designs and technical specification, handing over the Works and acceptance of the Completion Report by the Project Manager
1 st -half Retention Payment		Upon obtaining <ul style="list-style-type: none"> - Inspection Certificate from Fire Services Department - Electrical Inspection for Passenger Elevator from Directorate of Industrial Supervision and Inspection under Ministry of Industry - Building completion certificate from YCDC
2 nd -half Retention Payment		Upon satisfactory completion of the Guarantee Period, as certified by the Project Manager.
TOTAL.		

If any fee has to be paid to the Government Authorities for obtaining building completion certificate or any other certificate required for occupation of the building, the Contractor shall pay those fees and, upon submission of the relevant invoices, the Employer shall reimburse the same to the Contractor within 14 days.

31. Payment shall be made in USD if the Contractor is foreigner (in the case of JV, if the leading firm is foreigner), in MMK if the Contractor is a local firm (or in the case of JV, if the leading firm is local). The payment in MMK shall be made using the exchange rate for selling published by the Central Bank of Myanmar on the date of payment.
32. Time allowed for processing of payments will be as follows:
 - a. The Project Manager will inspect the Works and report to the Employer within 1 week after receiving the Request for Payment;
 - b. If a satisfactory progress report is issued before the scheduled date for payments, the Employer must issue a Certificate for Payment not later than 1 week after receiving progress report from the Project Manager.
 - c. Payment will be made within 2 weeks of the date issue of the Payment Certificate.
33. If any payment is delayed for more than 1 calendar month after the Due Date for Payment, the Employer will pay interest to the Contractor at the rate of 2% of the amount of the payment for the first month and for each subsequent full calendar month during which payments are delayed. In addition, the number of days during which the payment is delayed will automatically be added on to the time for completion of the project.
34. If the Contract is cancelled because of the fault of the Contractor, the Employer has the right to take over the Works and complete them by any other method. No payment will be made to the Contractor until the Works have been completed. Payment to the Contractor will be limited to the difference between the Contract Price and the cost to the Employer of completing the part of the work that was not implemented by the Contractor.

In witness of what has been agreed above, the signatures of the authorized representatives of the two Parties are affixed below on the date shown.

◆ <i>Name of Employer</i>		◆ <i>Name of Contractor</i>	
Signature of Authorized Representative		Signature of Authorized Representative	
Name	: -----	Name	: -----
Position	: -----	Position	: -----
Date	: -----	Date	: -----

SECTION 3 - BILL OF QUANTITIES (BOQ):

Bidders should fill in the unit and item prices in Columns 4 and 5 respectively, and submit this BOQ with the Bid. Bidders should read the Preamble carefully.

PREAMBLE TO THE BOQ:-

- 1. THIS BOQ IS FOR REFERENCE PURPOSES ONLY, AND SHALL BE USED EXCLUSIVELY FOR DETERMINING THE PRICE OF ADDITIONAL WORKS, IF ANY, APPROVED BY THE PROJECT MANAGER.**

- 2. THE DESCRIPTION OF ITEMS AND QUANTITIES SHOWN IN THE BOQ ARE INDICATIVE AND THE EMPLOYER PROVIDES NO ASSURANCE OF THEIR ACCURACY. THE BOQ, INCLUDING PRICES QUOTED THEREIN BY THE BIDDER, SHALL NOT CONSTITUTE THE BASIS FOR DETERMINATION OF THE BID PRICE OR THE CONTRACT PRICE, NOR FOR PAYMENTS UNDER THE CONTRACT.**

- 3. THE BID PRICE AND CONTRACT PRICE SHALL BE BASED ON THE PRICES QUOTED BY THE BIDDER IN THE ACTIVITY SCHEDULE-SECTION 6.**

- 4. PAYMENTS UNDER THE CONTRACT SHALL BE MADE ON LUMP-SUM BASIS AT THE SPECIFIED STAGES STIPULATED IN THE PAYMENT SCHEDULE AS PER THE CONDITIONS OF CONTRACT.**

BOQ for the Works for Contract Package : CW1.1.1 - Building and Infrastructure Works of PMU Building					
<i>Item no</i>	<i>Description (1)</i>	<i>Unit (2)</i>	<i>Quantity (3)</i>	<i>Rate (USD) (4)</i>	<i>Amount (USD) (5)</i>
	CIVIL WORKS				
1	Piling Work (Driven pre-cast concrete piling; all as Drawings and/or Specification)				
1.1	Supply, deliver, handle, transport, inspect pitch and drive pre-cast concrete pile including all moulds, reinforcement bar, welding, fixing, connection, cutting off pile concrete, metal end plate, hook, hole, head and all necessary materials and works; overall size : 200 x 200 x 30000 mm long (including mobilization for driven pre-cast concrete piling and for subsequently dismantling and removing from site)	m	4,267		
2	Earthwork				
2.1	Earthwork Excavation for Building Foundation and Infrastructure Works	m3	477		
3	Sand Filling Work				
3.1	Sand Back Filling and Compaction Work	m3	232		
3.2	Sand Filling Work for Ground Floor and Infrastructure Works	m3	80		
4	Hardcore Work				
4.1	(50x100)mm Crushed Rock with Sand Filling Work for Building Foundation, Ground Floor and Infrastructure Works	m3	177		
5	Concrete Work				
5.1	Grade - 15 Lean Concrete Work for Building Foundation and Infrastructure Works (f'c = 1450 psi)	m3	79		
5.2	Grade - 40 Concrete Work for Pile Cap (f'c = 4640 psi)	m3	78		
5.3	Grade - 35 Concrete Work for Structural Member and Infrastructure Work (f'c = 4000 psi)	m3	547		
6	Mild Steel Reinforcing Bar Work (fy = 55000psi : Mild Steel Reinforcing Bar Work for Pile Cap, Structural Member and Infrastructure Works)				
6.1	M.S Reinforcing Bar; 20 mm diameter	kg	63,100		
6.2	M.S Reinforcing Bar; 18 mm diameter	kg	1300		
6.3	M.S Reinforcing Bar; 16 mm diameter	kg	20500		
6.4	M.S Reinforcing Bar; 12 mm diameter	kg	46000		
6.5	M.S Reinforcing Bar; 10 mm diameter	kg	40,500		
6.6	M.S Reinforcing Bar; 8 mm diameter	kg	90		
6.7	M.S Reinforcing Bar; 6 mm diameter	kg	110		
7	Timber Formwork				
7.1	Timber formwork for Concrete Work	m2	4453		
8	Brick Wall Work ((1:3) Cement Mortar Brick Work for Building, Ground Tank and Septic Tank)				
8.1	450mm thk; Brick Wall Work	m3	4		
8.2	340mm thk; Brick Wall Work	m3	30		
8.3	225mm thk; Brick Wall Work	m3	29		
8.4	113mm thk; Brick Wall Work	m2	2200		

8.5	Parapet Brick Capping	m3	4		
8.6	Grade -25 Reinforced Concrete work for Window Sill & Lintel	lump-sum	1		
9	Cement Mortar Plaster Work				
9.1	20mm thk; (1:3) cement mortar Plaster for Exterior and Interior Wall	m2	5867		
10	(200x200)mm Glass Block Work				
10.1	Glass Block Work for Typical Floor	m2	2		
11	Aluminium light partition				
11.1	Typical Floor Light Partition	m2	347		
12	Shera Board Light Partition				
12.1	Penthouse Toilet Light Partition	m2	18		
13	Door				
13.1	Double Leaf Door with 60mm aluminium frame, 1.4mm thick white color powder coated frame, 8mm thick blue tinted tempered glass door, 60mm series, provision for door ironmongery installation				
13.1.a	MD1: size - 1930 x 2489 mm	no	6		
13.1.b	MD2: size - 1321 x 2489 mm	no	7		
13.2	Single Leaf Door with (150x50)mm pyingado chowket and 33mm thk; teak panel door leaf with polish finishing, provision for door ironmongery installation				
13.2.a	D1: size - 1016 x 2032 mm	no	2		
13.2.b	D1.a: size - 1016 x 2032 mm	no	8		
13.2.c	D1R: size - 1016 x 2489 mm	no	3		
13.2.d	D2: size – 864x2032 mm	no	9		
13.2.e	D3: size – 864 x 2032 mm	no	28		
13.2.f	T1: size - 711 x 2438 mm	no	4		
13.2.g	Door size - 533 x 838 mm	no	2		
13.3	One hour fire rated single/double leaf timber swing door with timber frame, provision for door ironmongery installation				
13.3.a	FD1: size - 1200 x 2400 mm	no	3		
13.3.b	FD2: size - 1100 x 2100 mm	no	2		
13.4	M.S Accordion Door with oil painted , lock, handle, sliding rail and roller: size - 1524 x 2134 mm	no	1		
13.5	Sliding Door Leaf with white color aluminium powder coated frame, 10mm thick, white color aluminium powder coated panel and 5mm thick gray tinted glass, provision for door ironmongery installation SLD: size - 1219 x 2083 mm	no	11		
14	Window				
14.1	Swing window with 50mm aluminium frame, 1.4mm thick white color powder coated frame, 5mm thick blue tinted glass panel, 50mm series provision for window ironmongery installation				
14.1.a	W2: size - 1372 x 2489 mm	no	10		
14.1.b	W2b: size - 1372 x 1524 mm	no	1		
14.1.c	W3: size - 2032 x 2489 mm	no	8		

14.1.d	W4; size - 2692 x 2489 mm	no	13		
14.2	Fix Fanlight with 50mm aluminium frame, 1.4mm thick white color powder coated frame, 5mm thick blue tinted glass panel, 50mm series including all necessary fittings and fixing accessories F2a: size - 1372 x 559 mm	no	1		
14.3	Fix window with 50mm aluminium frame, 1.4mm thick white color powder coated frame, 5mm thick blue tinted glass panel, 50mm series including all necessary fittings and fixing accessories				
14.3.a	GP6: size - 1930 x 2489 mm	no	1		
14.3.b	GP7: size - 2692 x 2489 mm	no	2		
14.3.c	GPC1 : size – 2532 x2286 mm	no	1		
14.3.d	GPC2 : size – 2627x2286 mm	no	1		
14.4	Fixed louver with 1.2mm thick (76.2x50.8) mm white color aluminium powder coated frame, 76.2mm width and 5mm thick clear glass shutter; including all necessary fittings and fixing accessories				
14.4.a	F1: size - 3699 x 610 mm	no	12		
14.4.b	F2: size - 2399 x 610 mm	no	6		
14.4.c	F3: size - 1219 x 610 mm	no	6		
14.4.d	FLM: size - 1930 x 610 mm	no	4		
15	External and Internal Wall Finish				
15.1	Emulsion paint for External Wall	m2	1676		
15.2	Emulsion paint for Internal Wall and Column	m2	3882		
15.3	Wall Tiling Work for WC Wall: (300x600)mm wall tile; with 2mm thick white cement	m2	304		
15.4	Waterproofing Work for WC Wall (Wall Height = 300mm)	m2	55		
15.5	Waterproofing Work for Ground Tank (Floor & Wall)	m2	74		
15.6	Iron Grill work with oil paint for store room at toilet building	m2	8		
16	Counter Slab: 100mm thk; Grade -25 Reinforced Concrete Slab with (600x600)mm Granite and 1000mm Height Brick Support				
16.1	Counter Slab - 3658 x 609 mm	no	2		
16.2	Counter Slab - 2438 x 609 mm	no	1		
17	Ceiling Finish				
17.1	Internal Emulsion Paint for Slab Ceiling	m2	732		
17.2	Gypsum Board Suspended Ceiling with plaster cornice including emulsion paint for gypsum board ceiling				
17.2.1	Gypsum Board Ceiling (C-1)	m2	736		
17.2.2	Gypsum Board Ceiling (C-2)	m2	178		
17.2.3	Gypsum Board Ceiling (C-3)	m2	200		
17.2.4	Gypsum Board Ceiling (C-4)	m2	43		
18	Floor Finish				
18.1	50mm thk; Grade -25 Concrete Levelling for Typical Floor, Ground Tank and Septic Tank	m2	2248		
18.2	Code -1, (600x600)mm Granite Flooring: (600x600) mm Granite with 20mm thk; (1:1) cement mortar and 2mm thk; white cement pointing floor	m2	605		

18.3	Code -2, (600x600) mm Ceramic Tile Flooring: with Carpet(600x600)mm Ceramic tile with 20mm thk; (1:1) cement mortar, 2mm thk; white cement pointing and Carpet floor	m2	163		
18.4	Code -3, Vinyl Flooring: Vinyl Flooring at Gust Room	m2	32		
18.5	Code -4, (300x300)mm Non-Slip Tile Flooring: (300x300)mm Non-Slip tile with 20mm thk; (1:1) cement mortar and 2mm thk; white cement pointing floor	m2	235		
18.6	Code -5,(600x600) mm High-Class Tile Flooring: (600x600)mm High-Class tile with 20mm thk; (1:1) cement mortar and 2mm thk; white cement pointing floor	m2	121		
18.7	Code -6, (600x600)mm Granite Flooring with Carpet: (600x600)mm Granite with20mm thk;(1:1) cement mortar, 2mm thk; white cement pointing and Carpet floor	m2	37		
18.8	Code -8, (600x600)mm Ceramic Tile Flooring: (600x600)mm Ceramic tile with 20mm thk; (1:1) cement mortar and 2mm thk; white cement pointing floor	m2	456		
18.9	Code -9, (300x300)mm Ceramic Tile Flooring: (300x300) mm Ceramic tile with 20mm thk; (1:1) cement mortar and 2mm thk; white cement pointing floor	m2	412		
18.10	Code -10, Waterproof Finished Flooring:	m2	646		
18.11	Waterproofing Area for Toilet Floor, outdoor corridor and emergency exist	m2	249		
19	Main Entrance Brick Steps with (600x600)mm Granite	lump-sum	1		
20	Stage: Stage Work including 25mmthk; Parquet Floor	lump-sum	1		
21	Handrail				
21.1	Main Stair Typical Handrail: SS 304, 1.2 mm thick stainless steel two side handrail; height = 914mm	m	55		
21.2	Portico Verandah Handrail: (106x56x2)mm gray color aluminium powder coated frame with 8mm thick blue tinted tempered glass and (150x100)mm curve R.C handrail; height = 1219mm	m	9		
21.3	Emergency Stair Typical Handrail: SS 304, 1.2mm thick, stainless steel one side handrail; height=914mm	m	24		
21.4	Outdoor Corridor Typical Handrail: SS 304, 1.2mm thick stainless steel handrail; height = 762mm	m	59		
21.5	Penthouse Floor Level Parapet Handrail: SS 304, 1.2mm thick stainless steel handrail; height = 305mm	m	52		
22	External Façade				
22.1	Sun Breaker at outdoor corridor of typical floor	m2	82		
22.2	Sun Breaker at Windows of typical floor	m2	55		
22.3	Verandah Transparent Roof	lump-sum	1		

22.4	Glass Sun Shade - A	m2	5		
22.5	Spiral Stair at Roof Slab	lump-sum	1		
23	Glass Curtain Wall: 2mm thick gray color powder coated curtain wall frame with 8mm thick blue tinted tempered glass panel wall including all necessary fittings and fixing accessories, materials, finishes, all as Drawings				
23.1	GP4: size - 3251 x 17374 mm	no	1		
23.2	GP5: size - 2540 x 17374 mm	no	1		
23.3	GP1d: size - 5182 x 2642 mm	no	1		
23.4	GP1b: size - 5182 x 3658 mm	no	2		
23.5	GP2: size - 3556 x 3658 mm	no	2		
23.6	GP2*: size - 3556 x 4572 mm	no	1		
23.7	GP2c: size - 3556 x 2642 mm	no	2		
23.8	GP3: size - 1422 x 3658 mm	no	2		
23.9	GP3c: size - 1422 x 2642 mm	no	1		
23.10	GP5b: size - 3556 x 2642 mm	no	1		
23.11	GP1a: size - 6096 x 4572 mm	no	1		
23.12	GP1c: size - 7925 x 3658 mm	no	1		
24	Roofing Work				
24.1	0.4mm thk; Colour Metal Sheet Roofing for Ground Tank and Car Parking	m2	207		
24.2	0.4mm thk; Colour Metal Ridging for Ground Tank	m	6		
24.3	Pyngado Truss for Ground Tank (Rafter , Tie & Purlin)	kg	360		
24.4	(150x25)mm Pyngado Eave Board (Including Putty Work & Oil Paint 3-Coats Work)	m	24		
25	Steel Structure Work for Car Parking				
25.1	20 mm ϕ L- 600mm Anchor Bolt	no	36		
25.2	8 mm thick M.S Plate	kg	100		
25.3	3.2 mm thk; 100mm ϕ M.S Pipe	kg	250		
25.4	2.8 mm thk; 75mm ϕ M.S Pipe	kg	390		
25.5	2.8 mm thk; 50mm ϕ M.S Pipe	kg	400		
25.6	2.3 mm thk; 40mm ϕ M.S Pipe	kg	310		
25.7	2.3 mm thk; Lip C-Channel - (100 x 50) mm	kg	850		
25.8	Painting Work for Steel Truss(Priming Coat Red Oxide & Oil Paint 3-Coats)	m2	73		
26	Gravel Filling Work for Septic Tank	m3	5		
27	Precast Concrete Block for Septic Tank				
27.1	431x406x76 mm	no	18		
27.2	508x381x76 mm	no	6		
27.3	150x150x150mm	no	40		
28	Side Drain and Apron Work: PMU Building : 900mm width and 75mm thk; Grade - 25 Concrete Apron & 300mm Average Depth Side Drain included Iron Grill Drain Cover with Oil Painted	lump-sum	1		
29	Concrete Paving, Car Parking Floor and Internal Road Side Drain				
29.1	Earthwork Excavation work	m3	118		

29.2	Sand Filling work	m3	14		
29.3	100mm thick (50x100)mm crushed rock with sand filling for hardcore	m3	32		
29.4	Grade -25 Concrete work for Drain, Paving and Car Parking Floor	m3	60		
29.5	M.S Reinforcing bar; 10mm diameter for internal road side drain cover	kg	270		
29.6	(1:3) cement mortar brick work for internal road side drain	m3	14		
29.7	20mm thick (1:3) cement mortar plaster for internal road side drain	m2	76		
30	Landscaping				
	Landscaping at project area	lump-sum	1		
WATER SUPPLY & SANITATION INSTALLATIONS					
31	Fixture and fitting ; including fixing and finishing materials. Toilet Accessories Sanitary wares; installation, including sanitary wares and required accessories such as P-trap, bottle trap, flexible, hose, angle valves, etc. and others to complete work				
31.1	Water Closet (Western)	no	29		
31.2	Mirror	no	26		
31.3	Toilet paper Holder	no	29		
31.4	Hand Spray	no	29		
31.5	Basin with Stand	set	26		
31.6	Water Tap for Basin	no	26		
31.7	Towel Rail	no	5		
31.8	Urinal	no	9		
31.9	Dividing screen between urinal	no	9		
	Kitchen sink; installation only including sanitary wares and required accessories such as P-trap, bottle trap, flexible hose, angle valves, etc. and others to complete works				
31.10	Kitchen sink	no	3		
31.11	Water Tap for Sink	no	3		
32	Water Supply System: Pump connection, Domestic Ground Tank & Septic Tank c/w valves, pipe connections and all necessary materials				
32.1	Submersible Sewage Pump Q=1.0L/s , H= 6m, HP = 0.25 HP	no	1		
32.2	Domestic Pump; with Motor Q=2.0L/s; H=33m, HP=1.5 HP General motor control cubicles; metal case; front plate; hinged door; starters; relays; switches; ammeters; indicating lamps; buzzers; start/stop push buttons; final inter- connecting wirings; labels; keys and Electrical power and control circuits to equipment, including connection to control panels.	no	2		
32.3	Electrical power Domestic Pump; with Motor Q=2.0L/s; H=33m, HP=1.5 HP Electrical power and control circuits to equipment, including connection to control panels, interconnecting wiring, cables, cable containment, relays,	lump-sum	1		

	contactors, sensors, thermostats and control devices, all necessary instruments and accessories as appropriate, fixing, earthing continuity, etc. to form a complete operational system				
33	Cold Water Pipe including fittings and accessories to complete works				
33.1	uPVC pipe ø 80 mm	m	13		
33.2	uPVC pipe ø 50 mm	m	68		
33.3	uPVC pipe ø 40 mm	m	49		
33.4	uPVC pipe ø 32 mm	m	59		
33.5	uPVC pipe ø 25 mm	m	43		
33.6	uPVC pipe ø 20 mm	m	69		
33.7	uPVC pipe ø 15 mm	m	241		
33.8	Domestic Tank Connection Overhead water tank connection c/w pipe connections, puddle flange, vent pipes, ball float valves, fittings, fixing.	no	7		
34	<u>Drainage Supply System:</u> uPVC pipe including fittings and accessories to complete works				
34.1	uPVC pipe ø 50 mm	m	97		
34.2	uPVC pipe ø 80 mm	m	108		
34.3	uPVC pipe ø 100 mm	m	91		
34.4	Septic Tank connection	Lump-sum	1		
35	<u>Rain Water Drainage System:</u> uPVC drainage pipe including fittings and accessories to complete works.				
35.1	uPVC pipe ø 80 mm	m	62		
35.2	uPVC pipe ø 100 mm	m	173		
36	<u>Fire Hose Reel System:</u> Pump sets; driving motor and casing; flexible connections to pipework; anti-vibration mountings; emergency stop push buttons; including all necessary accessories and Fire Pump Control Panel.				
36.1	Fire Hose Reel Pump: Q=2.3L/s; H=35m, hp=2.0 HP	no	2		
36.2	Electrical power and control circuits to equipment, including connection to control panels, interconnecting wiring, cables, cable containment, relays, contactors, sensors, and control devices, all necessary instrument and accessories as appropriate, fixing, earthing continuity, etc. to form a complete operational system Fire Hose Reel Pump Q=2.3L/s; H=35m, hp=2.0 HP	lump-sum	1		
37	GI Pipes c/w fittings, running joints and fixing.				
37.1	GI pipe ø 50	m	25		
37.2	GI pipe ø 25	m	3		
37.3	Hose reel comprising with isolating gate valve, union at inlet connection complete with branch nozzle and all necessary accessories; Fire hose reel Drum with Cabinet	no	4		
ELECTRICAL INSTALLATIONS					
38	Distribution board., breakers , bus-bar; integral main switch; panel case complete with finish as specified;				

	all as detailed on drawing and specification				
38.1	Main Distribution board	no	1		
38.2	Distribution Board - Ground Floor	no	1		
38.3	Distribution Board - First Floor	no	1		
38.4	Distribution Board - Second Floor	no	1		
38.5	Distribution Board - Penthouse Floor	no	1		
38.6	Distribution Board - Ground Floor Toilet	no	1		
38.7	Distribution Board – First Floor Toilet	no	1		
38.8	Distribution Board – Second Floor Toilet	no	1		
39	Metal Trunking and fittings ; covers; cable supporting facilities; running joints and fixings; earthing				
39.1	200mm x 100mm x 1mm	m	51		
39.2	100mm x 50mm x 1mm	m	85		
39.3	50mm x 50mm x 1mm	m	85		
40	Cable Tray: Facilities , running joint , fixings supporting and accessories with earthing:	m	20		
40.1	200mm x 25mm				
41	<u>Light Fittings and Sockets Outlets</u>				
41.1	35W Halogen Down Light	no	48		
41.2	9W PLC Down Light	no	60		
41.3	18W PLC Down Light	no	179		
41.4	Light Box with aluminium frame	no	11		
41.5	Covelight	m	138		
41.6	40W Ring Lamp	no	7		
41.7	Chandelier	no	14		
41.8	40W Fluorescent Lamp (Twin)	no	34		
41.9	Emergency Light	no	43		
41.10	Exit Light	no	29		
41.11	1 gang - 1 way switch 10A/220V	no	27		
41.12	2 gang - 1 way switch 10A/220V	no	46		
41.13	3 gang - 1 way switch 10A/220V	no	9		
41.14	1 gang - 2 way switch 10A/220V	no	10		
41.15	10" Exhaust Fan	no	38		
41.16	1 x 13A Single Socket Outlets (Wall Mounted)	no	184		
41.17	1 x 13A Multi Socket Outlets (Under Slab)	no	55		
41.18	1 x 15A Single Socket Outlets (P- N-E)	no	44		
	Final Circuit, approved cables and including conduits and fittings or any cable installing facilities				
41.18	Lighting Point	no	394		
41.19	Emergency and exit light point	no	72		
41.20	Socket point - 13A (P-N-E)	no	239		
41.21	Socket point - 15A (P-N_E)	no	44		
42	Main distribution line cable & other accessories Including cable Lugs, end caps, insulation tape, other accessories and all facilities				
42.1	1C x 25mm ² Cu/XLPE/PVC Cable	m	330		
42.2	1C x 16mm ² Cu/XLPE/PVC Cable	m	130		
42.3	1C x 16mm ² Cu/PVC CPC	m	175		
42.4	1C x 4mm ² Cu/XLPE/PVC Cable	m	45		
42.5	1C x 4mm ² Cu/PVC CPC	m	23		

42.6	1C x 10mm2 Cu/XLPE/PVC Cable	m	85		
42.7	1C x 10mm2 Cu/PVC CPC	m	43		
43	Lightning Protection and Earthing System: Lightning Protection and Earthing System c/w copper tapes, earth cables, earth rods, earth pits, earth clamps, etc.	lump-sum	1		
44	Passenger Elevator: 1000Kg, 60 meter/min 4 stops , AC 15KW, 400V,3Phase, 50Hz for power , Air-condition1.5hp to be provided at machine room	Set	1		
45	Split Type Air-conditioning System: Copper pipes and fittings , running joints and fixings; including all necessary valves and ancillaries, complete with insulation and all necessary accessories				
45.1	Aircon Split Type (1 HP)	no	9		
45.2	Aircon Split Type (2 HP)	no	21		
45.3	Aircon Split Type (3 HP)	no	14		
46	Closed Circuit Television System				
46.1	LCD (32") Monitor system and accessories	set	1		
46.2	Outdoor fixed Camera	no	8		
46.3	Indoor fixed Camera	no	4		
46.4	Indoor dome Camera	no	11		
46.5	Network video Recorder	no	1		
46.6	8 GB surveillance purple Hard Drive (HDD)	no	1		
46.7	L2, unmanaged 24x100m POE port, 2x1000M combo port, 802.3 af/at. 2x SFP Module, POE power budget 370W	no	1		
46.8	Final conduit point network cable, c/w box and fittings (conduits pipe, metal trunking and fittings wall plug screw, etc) facility including testing and commissioning	lump-sum	1		
47	Public Address System				
47.1	Ceiling Speaker (10W)	no	7		
47.2	Ceiling Speaker (6W)	no	5		
47.3	Box Speaker (10W)	no	4		
47.4	Box Speaker (3W)	no	7		
47.5	Pre-amplifier mixer panel	no	1		
47.6	240 Watt Power Amplifier (Paging, BGM, Standby)	no	4		
47.7	Remote Microphone	no	1		
47.8	Line Supervisory panel	no	1		
47.9	Monitor panel	no	1		
47.10	18U Floor Standing Rack	no	1		
47.11	Final conduit points with fire rated speaker ,c/w box and fitting (conduit pipe, metal trunking and fitting, wall plug, support, screw, etc.) and facility including testing and commissioning	lump-sum	1		
48	Telephone and Data System Telephone PABX System				
48.1	Telephone socket outlet	no	9		
48.2	PABX Unit (6 Co, 10 Ext, message waiting card)	no	1		
48.3	Main distribution frame	no	1		

48.4	Telephone cable and other accessories ,c/w box and fitting (conduit pipe, metal trunking and fitting, wall plug, support, screw, etc.) and facility including testing and commissioning	lump-sum	1		
	Data Network System				
48.5	Data Socket Outlet	no	127		
48.6	Wifi access point	no	6		
48.7	Rack panel, 16 port main layer switch. 8 port switch, 16 port switch, fire wall & other accessories	lump-sum	1		
48.8	Network cable and other essential accessories c/w box and fitting, conduit pipe, metal trunking, wall plug, screw, support and accessories including server network, access point configuration testing	lump-sum	1		
49	Fire Alarm System				
49.1	Addressable Fire Alarm Control Panel complete with battery and charger units fixings and the like all as detail on drawing and specification	no	1		
49.2	Addressable Smoke Detector install under ceiling	no	62		
49.3	Addressable Manual Call Point	no	13		
49.4	Fire Alarm Bell	no	13		
49.5	Final conduit point with fire rated cable c/w and fittings (conduit pipe, metal trunking and fittings, wall plug, screw, support) facilities including testing and commissioning	lump-sum	1		
				Total	

Name, Title and Signature of Bidder's Authorized representative:

.....

.....

Date:.....

SECTION 4. TECHNICAL SPECIFICATIONS AND DRAWINGS

All goods and materials to be incorporated in the Works be new, unused, of the most recent or current models, and incorporate all recent improvements in design and materials unless provided otherwise in the Contract.

List of Drawings are included after the Technical Specifications and a soft copy of the listed drawings will be provided to the bidders in a CD.

TECHNICAL SPECIFICATIONS

A. TECHNICAL SPECIFICATIONS FOR CIVIL WORKS

- 1 SPECIFICATION FOR CIVIL WORK PILING WORK
- 2 EARTHWORK
- 3 SAND FILLING WORK
- 4 HARDCORE WORK
- 5 CONCRETE WORK
- 6 REINFORCING (STEEL REBAR WORK)
- 7 FORMWORK
- 8 BRICK WORK
- 9 CEMENT MORTAR PLASTER WORK
- 10 (200x200)mm GLASS BLOCK WORK
- 11 ALUMINIUM LIGHT PARTITION
- 12 SHERA BOARD LIGHT PARTITION
- 13 DOOR
- 14 WINDOW
- 15 EXTERNAL AND INTERNAL WALL FINISHES
- 16 COUNTER SLAB
- 17 CEILING FINISHES
- 18 FLOOR FINISHES
- 19 MAIN ENTRANCE BRICK STEPS WITH(600x600)mm GRANITE
- 20 STAGE
- ~~21~~ HANDRAIL
- 22 EXTERNAL FAÇADE
- 23 GLASS CURTAIN WALL
- 24 ROOFING WORK
- 25 STEEL STRUCTURE WORK FOR CAR PARKING
- 26 GRAVEL FILLING WORK FOR SEPTIC TANK
- 27 PRECAST CONCRETE BLOCK FOR SEPTIC TANK
- 28 SIDE DRAIN AND APRON WORK
- 29 CONCRETE PAVING, CAR PARKING FLOOR AND INTERNAL ROAD SIDE DRAIN
- 30 LANDSCAPING

1. PILING WORKS

(a) PILE

Piles shall be used the driven pre-cast concrete square piles.

- (1) Properties for the driven pre-cast concrete square piles shall be as follow.

Dimension of pile	200mm x 200mm x 6m
Design pile capacity	50 tf

- (2) Piling depth shall be 30m.

- (3) Total number of piles shall be 140.

- (4) The minimum 28 days compressive cube strength of concrete for pile and pile cap shall be as follow:

Description	fc' (psi)	fc' _{cube} (psi)
Pile	4640	5800 (Grade 40)
Pile cap	4640	5800 (Grade 40)

- (5) Yield strength of reinforcement for pile and pile cap shall be as follow:

Description	fy (psi)	fy (psi)
Pile	60000	60000
Pile cap	55000	55000

- (6) Minimum concrete clear cover for pile and pile cap shall be as follow:

Pile	35mm
Pile Cap	50mm

- (7) Reinforcement for piles and pile caps shall be according to structural Drawings.

- (8) Do not use the pile too far deviated in size and the pile with the cracks of more than 0.2 mm in width. The depth of the corner cracks is not over 10mm.

(b) SETTING OF PILE

Pile driving equipment shall not travel/move at any condition while hanging the pile.

Pile shall be set up to angle of pile axis as specified in the design document and the set up pile shall be inspected by the Project Manager.

(c) WORKMANSHIP

Piles shall be driven at location as specified in the design document.

Original concentric axes of hammer and pile shall be maintained during pile driving work by combining the striking cap and supporting post.

Pile shall be cut off at the elevation as specified in the design document and if pile is damaged during cutting, it shall be removed or repaired.

(d) CONNECTION OF PILE

Piles shall be joined and connected by the method of arc welding. Only start connected welding of piles when:

- The dimension of the code list follows the design
- Pile axis is already checked the upright in two perpendicular directions.
- The surface at the end of two connecting piles must be contacted tightly together.

The connected welding of pile must ensure to follow the design on bearing capacity, does not have the following defects:

- The size of the connected welding is deviated from the design
- The height or width of the connected welding is not even.
- The connected welding is not straight, surface of the connected welding is rough, devoured, over temperature, spreading melt, mixing rust, cracked.

(e) CUTTING OFF PILE

Pile shall be cut off at the elevation as specified in the design document and any damaged part shall be neatly adjusted.

Pile head shall be embedded into the foundation concrete structure up to the depth specified in the design document.

When finishing the heads of concrete piles after cutting them at certain height, special care shall be taken to prevent cracks to the body of pile.

(f) DAMAGE PILE

If a pile is broken at any time during construction, it will be rejected and replaced with an acceptable pile at the cost of the Contractor.

2. EARTH WORK

This specification consists of all necessary excavation for all buildings, and Ground Tank, Septic Tank, Car Parking, backfilling, compaction of backfilling and the disposal of all excavated material

The Contractor shall clear the ground on the site and round the structures to be erected. Such clearing shall comprise removal of unsuitable materials.

2.1 EXCAVATION FOR FOUNDATION

All excavations shall be carried out to lines, levels and grades on the Drawings and / or as directed in writing by the Project Manager. There in condition is make shoring or dewatering at the time of excavation, the contractor is responsibility for that work at his own expense.

Excavated materials shall be removed from the site by the Contractor. Should any excavation be made to dimensions exceeding those stipulated, the difference thereof shall be at the Contractor's expense. Furthermore, to make good any such difference by refilling it with compacted soil, crushed stone, or plain concrete, as the case may be and according to the instructions of the Project Manager, without any extra payment or additional compensation whatsoever.

The excavation shall conform to the dimensions and elevations indicated for the structure in the Drawing. At no cost to the Employer, the excavation shall extend a sufficient distance from walls and footings to allow for placing and removal of forms and excavations below indicated depths shall not be permitted except to remove unsatisfactory material. Unsatisfactory material encountered below the grades shown in the Drawing shall be removed as directed by the Project Manager and be replaced with suitable material (for example, broken brick, sand, etc.)

Backfilling soil in excess of that required as backfill shall be transported by the Contractor to an on-station location to be used in site works as directed by Project Manager at no additional cost to the Employer. In case of surplus material it shall be disposed of as unsatisfactory excavated material. There shall be no payment for any kind of transportation in the works. All transportation items shall be included in relevant activity prices.

3. SAND FILLING WORK

Sand shall be used as fill for backfilling according to the Drawings.

Backfilling adjacent to structure shall be placed and compacted uniformly in such manner as to prevent wedging action or eccentric loading on or against structure.

Backfilling sand shall be mixed with water and then there shall be compacted by an approved compactor and methodology so that the fill material shall form a single homogeneous mass.

4. HARD CORE WORK

Hard core work that 70% of 2"x4" Crushed stone and 30% of sand shall be used for filling.

5. CONCRETE WORK

5.1 Specified the minimum 28 days compressive cylinder strength of concrete for piles and pile caps is 4640 psi. Grade 40 ready mixed concrete shall be used for piles and pile caps.

5.2 Specified compressive design cylinder strength of concrete for all members is 4000 psi. Grade 35 ready mixed concrete shall be used for all columns, beams, slabs and concrete stairs.

5.3 Specified the minimum 28 days compressive cylinder strength of 1:3:6 lean concrete is 1450 psi. Grade 15 ready mixed concrete shall be used for 1:3:6 lean concrete.

(a) TESTING PLAN

The Contractor shall provide necessary tools/equipment for the on-site tests, and make necessary payments for the laboratory tests.

Slump test shall be carried out for every concreting works at work site and results are needed to be approve by the Project Manager.

One sample of two cubes shall be taken from a randomly selected concrete delivery vehicle. 3 samples shall be taken for concrete volume less than 50 m³. 5 samples shall be taken for concrete volume within 50 ~ 100 m³.

Concrete sample cubes shall be adequately cured for a minimum of 7 days and then 7 days cube test, 28 days cube test shall be made. All cubes tests are to be carried out in a laboratory approved by the Project Manager. The taking of samples for carrying out such tests shall be carried out under the supervision and direction of the Project Manager.

(b) FINAL PREPARATION AND INSPECTION

No concrete shall be poured without the Project Manager's permission. The Project Manager shall be notified of any concrete pour 24 hours in advance for an inspection to be made of the formwork, under lays sub-bars, reinforcement, expansion joints, anchors and other items that are to be embedded in the concrete. The required concrete cover shall be inspected by the Project Manager.

The Contractor is to allow for such inspections and for making any required or instructed corrections.

Immediately before the concrete is placed in any section of the formwork, the interior of that section shall be completely cleared of all extraneous material, including water, by means of compressed air, or other approved methods.

Each section of formwork for structural members shall be inspected by the Project Manager immediately before concrete is placed in that section, and the Contractor shall carry out any adjustments to formwork, reinforcement or levels as instructed by the Project Manager, prior to placing of any concrete.

All reinforcements shall be free from rust, mud, paint, oil or any other substances which may adversely affect the steel or concrete chemically, or reduce the bond. The Project Manager may instruct the Contractor to clean off thoroughly any such substance by wire brushing or other methods at the Contractor's cost.

Inspection and approval of any works by the Project Manager do not remove the Contractor's responsibility under the Contract.

(c) TRANSPORTING, PLACING AND COMPACTING OF CONCRETE

Concrete shall be transported from the mixer to the formwork as rapidly as practicable by method which will prevent the segregation or loss of any of the ingredients and maintain the required workability.

All placing and compacting shall be carried out under the direct supervision of a competent member of the Contractor's staff. Concrete shall normally be placed and compacted soon after mixing. Care shall be taken to avoid the displacement of reinforcement or movement of formwork and damage to faces of formwork.

Concrete shall be thoroughly compacted by vibration, unless otherwise agreed by the Project Manager, during the operation of placing, and thoroughly worked around the reinforcement, tendons or duct formers around embedded fixtures and into corners of the formwork to form a solid mass free from voids and which will have the required surface finish when the formwork is removed. Vibration shall be applied continuously during the placing of each batch of concrete until the explosion of air has practically ceased and in a manner which does not promote

segregation of the ingredients.

(d) CURING

All concrete shall be cured with water. The surface of slab concrete shall be cured by covering, after casting with a layer of sand or any other material acceptable to the Project Manager. The surface of concrete shall be adequately cured for a minimum of 7 days.

6. MILD STEEL REINFORCING BAR WORK (STEEL REBAR WORK)

- 6.1 M.S Deformed (ribbed) Reinforcing Bar; 20 mm diameter
- 6.2 M.S Deformed (ribbed) Reinforcing Bar; 18 mm diameter
- 6.3 M.S Deformed (ribbed) Reinforcing Bar; 16 mm diameter
- 6.4 M.S Deformed (ribbed) Reinforcing Bar; 12 mm diameter
- 6.5 M.S Deformed (ribbed) Reinforcing Bar; 10 mm diameter
- 6.6 M.S Plain Reinforcing Bar; 8 mm diameter
- 6.7 M.S Plain Reinforcing Bar; 6 mm diameter

(a) MATERIALS

The reinforcing bar schedule are identified on the Drawing. MS reinforcing bar shall be stored clear working areas and supported above the surface of the ground, and shall be protected from damage and from deterioration due to exposure.

Reinforcement hooks and bends shall comply with the requirement of Drawings.

Specified yield strength of steel for main bars and for ties and stirrups is 55000 psi. Deformed reinforcing bars shall be used for 20mm \emptyset , 18mm \emptyset , 16mm \emptyset , 12mm \emptyset and 10mm \emptyset bars. Plain reinforcing bar may be used for 8mm \emptyset and 6mm \emptyset bars.

(b) TESTING

The Contractor shall supply the Project Manager with a test certificate from the accredited lab showing compliance with specified requirements. Moreover, one tension test for each and every size of the reinforcing bars shall be made for each lot of 50 tones supplied for the works or as frequently as required by the Project Manager.

(c) CUTTING AND BENDING

Reinforcement details are provided in the Drawings. The Contractor shall determine from these Drawings the required dimensions of the bars, and shall cut and bend the reinforcement in accordance with Drawing to meet the requirement of cover, lap length, etc. as indicated on the Drawings.

(d) FIXING

All reinforcement shall be accurately placed with correct cover and securely fixed in the positions shown on the Drawings, by an approved method, binding wire, etc. shall be fixed such that it does not encroach in to the concrete cover.

The Contractor shall supply and fix all chairs required to maintain the reinforcement in the correct positions.

7. TIMBER FORMWORK

(a) GENERAL

Formwork for all main structural members, such as columns, beams, slabs and stairs shall be erected the correct dimensions specified on the structural drawings. 9mm thick plywood shall be used for formwork panels and timber props shall be used for formwork props. Timber props

shall be straight, clear of knots and cracks and shall not be spliced.

The internal faces of formwork shall be coated with an approved release agent. Release agents shall be Red oxide. The internal faces of formwork shall be coated with 2-coats of Red oxide. Release agents shall be applied evenly and care shall be taken to ensure that the release agents do not come into contact with reinforcement.

(b) FORMWORK DESIGN

Formwork panels shall be rigid enough to prevent damage to the concrete surface by excessive movements of the panels during vibration of the concrete.

The design and construction of formwork shall be carried out by competent personnel, taking due account of the surface finished required. The formwork shall be sufficiently rigid and tight to prevent loss of grout or mortar from the concrete during the placing and compacting of concrete by appropriate methods.

Formwork (including supports) shall be sufficiently rigid to maintain the forms in correct positions and to correct shape and profile so that the final concrete structure is within the limits of the dimensional tolerances and deviations specified. The supports shall be designed to withstand the worst combination of self-weight, formwork weight, formwork forces, reinforcement weight, wet concrete weight and construction loads, together with all incidental dynamic effects caused by placing, vibrating and compacting the concrete.

The formwork shall be so arranged as to be readily dismantled and removed without causing damaged to the cast concrete.

Damage formwork shall not be used.

(c) STRIKING OF FORMWORK

(i) GENERAL

Before the formwork is removed, the Contractor shall ensure that the concrete has attained sufficient strength and that the structure will be stable and not adversely affected when formwork is struck.

The responsibility for the safe removal of any part of the formwork or props rests entirely with the Contractor.

(ii) MINIMUM FORMING PERIOD

The minimum period before removing formwork to structural members shall be as follow:

LOCATION	PERIOD
Beam sides, Walls and Columns	3 days
Slab soffit formwork (Props released)	7 days
Formwork props to slabs	14 days
Beam soffit formwork (Props released)	8 days
Formwork props to beams	15 days

8. BRICK WORK

(a) GENERAL

Provide brick where shown on the Drawings as specified here in and as needed for a complete

proper installation. First class Bricks (compressive strength 105 kg/cm²) for General Construction used size 230x110x70mm or as specified on Drawings or local standard. Local materials shall be major consideration. 1:3 cement mortar shall be used for brick works. Hollow brick with 8round holes shall be used for brick works.

(8.1) 450mm thick brick wall work shall be installed for retaining wall as shown on the drawings.

(8.2) 340mm thick brick wall work shall be installed for retaining wall as shown on the drawings.

(8.3) 225mm thick brick wall work shall be installed for retaining wall as shown on the drawings.

(8.4) 113mm thick brick wall work shall be installed for walling as shown on the drawings.

(8.5) Parapet Brick Capping.

Note: Clean the area of bricklaying, draw the lines for the correct laying alignment as indicated on the Drawing.. Pour (1:3) cement mortar to row of brick masonry. Lay the brick of the first row on the mortar, plumb and true to line. Lay the bricks of the next row. Lay the bricks of row by row. The thickness of bricklaying mortar is not less than 10mm. Lay with completely filled mortar joint and good alignment.

The rates for brick walling shall also include wire mesh to be embedded in every 3 layers of brick work. Put steel bar (diameter 6mm) while pouring concrete for brick masonry structure, such as at the side of column that will attach to the brick wall, every 40mm of vertical line. The part of steel bar in reinforced concrete column shall be bent as a hook. The minimum length of the steel bar that stick out from the column is 300mm.

Install sleeve in the brick wall for piping of various building systems as indicated on the drawings such as sanitation system, electric, air conditioned. Install sleeve carefully without the gaps around the sleeve and fill the gap completely using brick laying mortar.

(8.6) Grade -25 Reinforced Concrete work for window Sill & Lintel

Put the window sill under the window frame or chowket. Window sill is Grade 25 reinforced concrete. Provide reinforcing steel bars (diameter 6mm, 2 bars) and lateral reinforcement (diameter 6mm, every 200mm). Reinforcing steel bars of window sill shall be embedded into both side of the reinforced concrete column. Window sill size shall be thickness (150 mm) and width is equal to the brick wall.

Tie column and lintel beams are required at the corner of brick wall or the brick wall which do not attach to the reinforced concrete column or the bottom of beam or floor or the brick wall which attach to door frame and window frame. Tie columns and lintel beams are Grade 25 reinforced concrete. Size shall be 150mm thickness and width is equal to the brick wall. Provide reinforcing steel bars (diameter 6mm, 2bars) and lateral reinforcement (diameter 6mm, every 200mm). Reinforcing steel bars of the columns and lintel beams shall be embedded into both side of the reinforced concrete floor or beam or column or welded with the steel bar. Tie columns shall provide every 2.5 m of the length of the brick wall, lintel beams shall be provided every 2 m of the height of the brick wall.

9. CEMENT MORTAR PLASTER WORK

All interior and exterior of brick walls, all columns and waist surface of concrete stairs shall be plastered with 20mm thick 1:3 cement mortar.

Plastering work shall be straight in horizontal and vertical alignment. The plastering surface

shall be smooth and good quality. The plastering surface shall be adequately cured for a minimum of 3 days.

Plastering work for exterior wall includes scaffolding work as well.

10. (200x200)mm GLASS BLOCK WORK

- (200x200) mm, 75mm thickness standard glass block and white cement shall be used. LANDMARK Brand or equivalent shall be used for glass block.
- Locations and dimensions shall be as shown on the Drawings.
- Glass block wall shall be straight at horizontal and vertical alignment.

11. ALUMINIUM LIGHT PARTITION

- **Frame:** (100x50) mm, 1mm thickness aluminium white colour powder coated shall be used. Aluminium powder coated warranty shall be 10 years. YUNCHANG Brand or equivalent shall be used.

Normally, vertical frame shall be installed at 900mm c/c width. But it shall be installed to get equal or proper width according to the partition width and it shall not be installed at more than 1200 mm c/c. Horizontal frame shall be installed as follows,

Bottom line	- At floor
2nd line	- 900mm height above the floor
3rd line	- 1200mm height above the 2nd line.
Above the 3rd line	- It shall be installed to get equal or proper height according to the partition height. It shall be installed at ≤ 900 mm height or > 900 mm ≤ 1200 mm height above the 3rd line.

- **Aluminium Panel:** (100x10) mm, 1mm thickness aluminium white colour panel shall be used for partition wall 900mm height above the floor. YUNCHANG Brand or equivalent shall be used.
- **Glass:** 5mm thick Gray Tinted glass shall be used with Angle 20x20 mm aluminium click and glass liner for partition wall above the aluminium panel.

YUNCHANG Brand or equivalent shall be used for aluminium click.
Singapore made glass shall be used.

12. SHERA BOARD LIGHT PARTITION

- **Frame:**(75x50) mm, 1mm thickness aluminium white colour shall be used. .SMS Brand or equivalent shall be used. Aluminium frame shall be installed at maximum 600mm c/c for vertical frame and 1200 mm c/c for horizontal frame.
- **Board:**(2400x1200) mm, 8mm thickness Shera Board shall be used. Shera Board shall be fixed at both side of aluminium frame.
- **Screw:**25mm Length black screw shall be used for shera board fixing work.
- **Emulsion Paint Painting work for Partition:**
 - Putty 1 coat, sealer 1 coat and colour 2 coats shall be painted.
 - STO Tinplast or equivalent shall be used for wall putty.
 - Orient sealer or equivalent shall be used for sealer.

- Orient Profession Emulsion Paint or equivalent shall be used for colour painting. Colour for partition shall be described by the Project Manager.

13. DOOR

For all the doors the Contractor shall prepare shop drawings and receive the Project Manager's approval before manufacturing.

Location of the Doors shall be as shown on the Drawings.

13.1 Double Leaf Aluminium Doors (MD1, MD2)

- **Size :** MD-1 -1930mm x 2489mm
MD-2 – 1321mm x 2489 mm
- **Frame:** 60 series (60mm aluminium frame, 1.5mm thickness) white colour powder coated shall be used. Aluminium profile and powder coated warranty shall be 10 years. YUNCHANG Brand or equivalent shall be used.
- **Glass:** 8mm thickness Blue Tinted Tempered Glass shall be used. .ASAHI Brand or equivalent shall be used.
- Door handle with lock, butt hinges for aluminium door shall be included in door leaf work. KIN LONG Brand or equivalent shall be used.

13.2 Single Leaf Teak Doors (D1, D1a, D1R, D2, D3, T1 & D4)

- **Chowket:** (150x50) mm Pyingado chowket shall be used. It shall be corrected dimensions and shall be straight member, clear of knots and cracks.
- **Door Leaf:** 33mm thickness teak paneled door Grade B shall be used. Dimension and designs shall be as shown on the Drawings.
- **Door Lock:** Dale (SS 587) Brand or equivalent shall be used.
- **Butt Hinge:** SS 304 3mm thickness, 100mm butt hinge 3 Nos shall be used each door. Archie Brand or equivalent shall be used.
- **Polish work:** Door chowket and door leaf shall be polished with filler 1 coat, sealer 3 coats and lacquer 2 coats. Betex filler or equivalent, Betex 422 sealer or equivalent and TOA Lacquer or equivalent shall be used.

13.3 One hour fire rated single/ double leaf timber swing door with timber frame, provision for door ironmongery and installation (FD1, FD2)

(A) One hour fire rated single leaf timber swing door (FD2)

- **Door Size:** Height 2100 mm x Width 1100mm x Thickness 45mm
- **Finish:** Formica high pressure laminated finish is included.
- **Handle:** Steel silver coloured touch bar panic exit device with round rosette lever handle shall be used. SD OR SS Brand or equivalent shall be use
- **Lock:** Mortise sash lock case shall be used. MS 103 SS Brand or equivalent shall be used.

- **Hinge:** stainless steel matt 304 two ball bearings hinge (H127xW76xThk;2.5) mm, 4Nos shall be used. HG1152ASS Brand or equivalent shall be used.
- **Door Closer:** Aluminium alloy high quality oil used, special O.ring seals to avoid leakage, with normal arm, 80kg (Tested 500,000 cycles), 1 No shall be used.
- **Note:** The manufacturer has to be subject to prior approval of the Project Manager. The manufacturer has to have Myanmar Fire Services Department approved certificate, and it should be presented to the Project Manager together with the relevant information about the proposed manufacturer for approval to the Project Manager.

(B) One hour fire rated double leaf timber swing door (FD1)

- **Door Size:** Height 2400 mm x Width 1200mm x Thickness 45mm
- **Finish:** Formica high pressure laminated finish is included.
- **Handle:** Steel silver coloured touch bar panic exit device with round rosette lever handle shall be used.SD OR SS Brand or equivalent shall be use
- **Lock:** Mortise sash lock case for double door leaf shall be used.
- **Hinge:** stainless steel matt 304 two ball bearings hinge (H127xW76xThk;2.5) mm, 8Nos shall be used. HG1152ASS Brand or equivalent shall be used.
- **Door Closer:** Aluminium alloy high quality oil used, special O.ring seals to avoid leakage, with normal arm, 80kg (Tested 500,000 cycles), 2 No shall be used.
- **Note:** The manufacturer has to be subject to prior approval of the Project Manager. The manufacturer has to have Myanmar Fire Services Department approved certificate as explained before.

13.4 Aluminium Sliding Door (SLD)

- **Vertical Frame:** 51.3mmx46mm, 1mm thickness aluminium white colour powder coated shall be used.
- **Bottom Rail:** 81mmx44mm, 1mm thickness aluminium white colour powder coated shall be used.
- **Middle Rail:** 80mmx44mm, 1mm thickness aluminium white colour powder coated shall be used.
- **Top Rail:** 54mmx44mm, 1mm thickness aluminium white colour powder coated shall be used.
Aluminium profile and powder coated warranty shall be 10 years.
- **Aluminium Panel:** 100mmx10mm, 1mm thickness aluminium white colour panel shall be used.
Handle and lock shall be included in door work.
YUNCHANG Brand or equivalent shall be used for aluminium frame, rails and panels.

- **Glass:** KIN LONG Brand or equivalent shall be used for handle and lock.
5mm thickness Gray Tinted glass shall be used with glass liner.
Singapore made glass or equivalent shall be used.

13.5 Mild Steel Accordion Door

- **Frame:** L38mm, 4mm thickness M.S angle shall be used
- **Accordion channel:** 20mmx10mm, 2mm thickness MS accordion channel shall be used.
GRADE SUPER Brand or equivalent shall be used.
Accordion channel shall be installed at 10mm c/c.
- **MS Flat:** 20mm width 5mm thickness M.S flat shall be used for door leaf.
- **Bottom rail:** 25mm width 12mm thickness M.S flat shall be used for middle of bottom rail and 25mm width 6mm thickness M.S flat shall be used for outer rails of bottom rail.
- **Top rail:** 50mm width 12mm thickness M.S flat shall be used.
- **Roller:** 50mmØ U.C ball shall be used.
- **Painting:** Red oxide 1 coat and oil paint 2 coats shall be painted. UPG PREMIER Brand or equivalent shall be used.
Colour shall be described by the Project Manager.

14. WINDOW

For manufacturer of all the window frames and glasses the Contractor shall obtain the Project Manager's prior approval. The Contractor shall prepare shop drawings and receive the Project Manager's approval before manufacturing as well
Locations and dimensions shall be as shown on the Drawings.

14.1. Swing Window (W2,W2b,W3,W4)

- **Frame:** 50 series (50mm frame, 1.4mm thickness, white colour powder coated) frame shall be used. Frame shall be screw type and leaf shall be click type. Aluminium profile and powder coated warranty shall be 10 years. YUNCHANG Brand or equivalent shall be used for aluminium frame leaf.
- **Glass:** 5mm thickness Blue Tinted glass shall be used. ASAHI Brand or equivalent shall be used.
- **Handle & Butt Hinge:** KIN LONG Brand or equivalent shall be used.
- **Silicon:** Silicon warranty shall be minimum 5 years. Dow corning Brand or equivalent shall be used.

14.2. Fix fanlight (F2a)

- **Size:** 1372x559mm
- **Frame:** 50 Series (50mm frame, 1.4mm thickness, white colour powder coated frame) shall be used. Aluminium profile and powder coated warranty shall be 10 years. YUNCHANG Brand or equivalent shall be used.

- **Glass:** 5mm thickness Blue Tinted glass shall be used..ASAHI Brand or equivalent shall be used.

14.3 Fix window (GP6,GP7, GPC1, GPC2)

- **Size:**
 - (a) GP6- 1930mmx2489mm
 - (b) GP7- 2692mmx2489mm
 - (c) GPC1- 2532mmx2286mm
 - (d) GPC2-2627mmx2286mm
- **Frame:** 50 Series (50mm frame, 1.4mm thickness, white colour powder coated frame) shall be used.Aluminium profile and powder coated warranty shall be 10 years. .YUNCHANG Brand or equivalent shall be used.
- **Glass:** 5mm thickness Blue Tinted glass shall be used. ASAHI Brand or equivalent shall be used.

14.4 Fix Louver (F1, F2, F3, FLM)

- **Size:**
 - (a) F1- 3699mm x 610mm
 - (e) F2- 2399mm x 610mm
 - (f) F3- 1219mm x 610mm
 - (g) FLM- 1930mm x 610mm
- **Frame:** (76.2x50.8) mm, 1.2mm thickness, white colour aluminium powder coated frame shall be used. Aluminium profile and powder coated warranty shall be 10 years. YUNCHANG Brand or equivalent shall be used.
- **Glass:** 76.2mm width 5mm thickness clear glass shutter shall be used. Singapore made glass shall be used.

15. EXTERNAL AND INTERNAL WALL FINISHES

15.1 Emulsion Paint for External wall

- External wall shall be painted wall putty 2- coats, sealer 1 coat and colour paint 2 coats.
- STO Tinplast or equivalent shall be used for wall putty.
- Orient Sealer or equivalent shall be used for wall sealer.
- Orient Professional Emulsion Paint or equivalent shall be used for colour paint.
- Wall colour shall be subject to the Project Manager's prior approval.

15.2 Emulsion Paint for Internal wall and column.

- Internal wall and columns shall be painted wall putty 2- coats, sealer 1 coat and colour paint 2 coats.
- STO Tinplast or equivalent shall be used for wall putty.
- Orient Sealer or equivalent shall be used for wall sealer.
- Orient Professional Emulsion Paint or equivalent shall be used for colour paint.
- Wall colour shall be subject to the Project Manager's prior approval.

15.3 Wall tiling work for W.C wall

- 300x600 mm, 8mm thick ceramic tile shall be used.
- 20mm thick cement mortar shall be used for tiling.
SCG Brand cement or equivalent shall be used.
- 2mm thick white cement pointing shall be used for tiling.

15.4 Waterproofing work for W.C wall (wall height 300mm)

- LANKO LK222 Flexible waterproofing system application 2.5 kg/m² or equivalent shall be used.

15.5 Waterproofing work for Ground Tank (floor & wall)

- **For Floor:** LANKO LK202 waterproofing system application 2 kg/m² or equivalent shall be use before concreting for Ground Tank floor. LANKO LK 322 1.5 lit shall be mixed with 1m³ of concrete for Ground Tank floor or equivalent shall be used according to the manufacturer's description.
- **For Wall:** LANKO LK 225 waterproofing system application 2 kg/m² or equivalent shall be used.

15.6 Iron Grill work for Store Room at Toilet Building

- Iron Grill work shall be made as shown on the Drawings.
- Iron Grill work shall be painted red oxide 1 coat and oil paint 2 coats.

16. COUNTER SLAB

16.1 Counter slab (3300x600) mm, 1000mm height

- **Support:** 900mm height, 113mm thick brick wall work with 1:3 cement mortar and plastering with 20mm thick 1:3 cement mortar shall be used.
- **Slab:**
 - (a) 100mm thick reinforced concrete slab shall be used.
 - (b) Grade 25 ready mixed concrete and 10mmØ MS rod @ 6" c/c bothway shall be used for counter slab.
 - (c) Counter slab shall be plastered with 20mm thick 1:3 cement mortar.
 - (d) 600mmx600mm, 15mm thickness Granite shall be used for counter slab.

16.2 Counter slab (2400x600) mm, 1000mm height

- Work procedure is same as item 16.1.

17. CEILING FINISH

17.1 Emulsion paint for concrete ceiling

- Concrete ceiling shall be painted putty 2 coats, sealer 1 coat and colour 2coats.
- STO Tinplast or equivalent shall be used for putty.
- Orient Sealer or equivalent shall be used for sealer.
- Orient ceiling white emulsion paint or equivalent shall be used for colour paint.

17.2 Gypsum board suspended ceiling with Plaster cornic (including emulsion paint for gypsum board ceiling)

(2400x1200)mm gypsum board with mail bar, cross bar, long thread, wall angle, wall plug, screw and plaster cornic skirting shall be used.

- **Gypsum board:** (2400x1200) mm, 9mm thickness R.E gypsum board shall be used. SCG Brand or equivalent shall be used.
- **Main bar:** (15x25) mm, 0.6mm thickness, 300mm length main bar shall be used. Main bar shall be installed at 900 mm c/c. OWES Brand or equivalent shall be used.
- **Cross bar:** (50x15), 0.35mm thickness, 3000mm length cross bar shall be used. Cross bar shall be installed at 406mm c/c. OWES Brand or equivalent shall be used.
- **Long Thread:** 8mmØ G.I Long thread shall be used. Long Thread shall be installed at 3000 mm c/c along main bar.

- **Wall Angle:** (25x25) mm, 2400mm length GI L bar shall be used.
- **Wall Plug:** M-7 PVC wall plug with 32mm length steel screw shall be installed at 450mm c/c along wall angle.
- **Screw:** 25mm length black shall be used for gypsum board ceiling fixing.
- **Plaster Cornic:** 127mm width 2400mm length plaster cornic with super 98 powder shall be used for gypsum board ceiling skirting/
- **Painting work:** Gypsum board ceiling with plaster cornic shall be painted putty 2 coats, sealer 1 coat and colour 2 coats.
25mm width joint tape with super 98 powder shall be used at joining of gypsum boards.
STO Tinplast or equivalent shall be used for putty.
Orient Sealer or equivalent shall be used for sealer.
Orient ceiling white emulsion paint or equivalent shall be used for colour paint.

18. FLOOR FINISH

18.1 Concrete floor leveling work for typical floor, Ground Tank and Septic tank.

- Grade 25 ready mixed concrete 50mm thickness shall be used for concrete floor leveling

18.2 Code-1: (600x600)mm Granite Flooring

- (600x600) mm, 15mm thickness with simple polishing Granite shall be used.
- 20mm thickness 1:1 cement mortar shall be used for granite flooring work.
- 2mm thickness white cement pointing shall be used for granite floor pointing work.

18.3 Code-2: (600x600) mm Ceramic Tile Flooring with Carpet

- (600x600) mm, 8mm thickness with 2 coats polishing Ceramic tile shall be used.
- 20mm thickness 1:1 cement mortar shall be used for ceramic tile flooring work.
- 2mm thickness white cement pointing shall be used for ceramic tile floor pointing work.
- 1950 mm width ,1mm thickness Plain Carpet(Korea made) shall be used.

18.4 Code-3: Vinyl Flooring

- (180x1200) mm, 3mm thickness vinyl with adhesive shall be used for vinyl flooring. Homelive Brand or equivalent shall be used for vinyl adhesive.

18.5 Code-4: (300x300) mm Non-slip Tile Flooring

- (300x300) mm, 5mm thickness Non-slip Tile shall be used. SOCUCO Brand or equivalent shall be used.
- 20mm thickness 1:1 cement mortar shall be used for non-slip tile flooring work.
- 2mm thickness white cement pointing shall be used for non-slip tile floor pointing work.

18.6 Code-5: (600x600) mm High Class Tile Flooring

- (600x600) mm, 10mm thickness with cristal coating tile shall be used.
- 20mm thickness 1:1 cement mortar shall be used for high-class tile flooring work.
- 2mm thickness white cement pointing shall be used for high-class tile floor pointing work.

18.7 Code-6: (600x600) mm Granite Flooring with carpet

- (600x600) mm, 15mm thickness with simple polishing granite shall be used.
- 20mm thickness 1:1 cement mortar shall be used for granite flooring work.
- 2mm thickness white cement pointing shall be used for granite floor pointing work.
1950mm width, 1.2mm thickness designed carpet (Korea made) shall be used.

18.8 Code-7: (600x600) mm Granite Flooring

- (600x600) mm, 15mm thickness with simple polished granite shall be used.
- 20mm thickness 1:1 cement mortar shall be used for granite flooring work.
- 2mm thickness white cement pointing shall be used for granite floor pointing work.

18.9 Code-8: (600x600) mm Ceramic Tile Flooring

- (600x600) mm, 8mm thickness with 2 coats polishing ceramic tile shall be used.
- 20mm thickness 1:1 cement mortar shall be used for ceramic tile flooring work.
- 2mm thickness white cement pointing shall be used for ceramic tile floor pointing work.

18.10 Code-9: (300x300) mm Ceramic Tile Flooring

- (300x300) mm, 5mm thickness ceramic tile shall be used. SOSUCO Brand or equivalent shall be used.
- 20mm thickness 1:1 cement mortar shall be used for ceramic tile flooring work.
- 2mm thickness white cement pointing shall be used for ceramic tile floor pointing work.

Note: Colour and design of all Tiles, Granites, Vinyl and Carpets shall be subject to the Project Manager' prior approval.

18.11 Code-10: Waterproof finished for Roof Slab

- LANKO LK 451 Flexible waterproofing system application 1.5 kg/m² or equivalent shall be used.

18.12 Waterproofing Area for Toilet Floor, outdoor corridor floor and emergency exit floor

- LANKO LK 222 Flexible waterproofing system application 2.5 kg/m² or equivalent shall be used.

19 MAIN ENTRANCE BRICK STEPS WITH (600x600)mm GRANITE

- (600x600) mm, 20mm thickness with simple polishing granite shall be used.
- 20mm thick 1:1 cement mortar and white cement pointing shall be used for granite flooring work.
- 2mm thickness white cement pointing shall be used for granite floor pointing work.
- Step nozzing shall be 25mm with round edge.
- Colour and design of Granite shall be described by the Project Manager.

20 STAGE

- Stage work shall be built as shown on the drawings.
- 25mm thickness parquet shall be used for parquet floor.

21. HANDRAIL

For all the handrails the Contractor shall prepare shop drawings and receive the Project Manager's approval before manufacturing.

21.1 Main Stair Typical Handrail (914mm Height)

- **Top Rail:** SS 304 (50) mm ϕ , 1.2 mm thickness circular stainless steel handrail shall be used.
- **Middle Rail & Bottom Rail:** SS 304 (38x38)mm, 1.2mm thickness stainless steel shall be used.
- **Start Post:** SS 304 (76)mm ϕ , 1.2mm thickness 914 mm height stainless steel shall be used.
- **Stanchion Post:** SS 304 38 mm ϕ , 1.2mm thickness stainless steel shall be used.
- **Vertical Member:** SS 304 25.4mm ϕ , 1.2mm thickness stainless steel shall be used.

21.2 Portico Verandah Handrail (1219mm height)

- **Top Rail:** (150x100) mm reinforced concrete curve handrail shall be built. Provided reinforcing steel bars (diameter 10mm, 2 bars) and lateral reinforcement (diameter 6mm, every 150mm) for reinforced concrete curve handrail.
- **Handrail with Frame:** (106x56) mm , 2mm thickness gray colour aluminium powder coated frame shall be used for top and bottom horizontal frame and (106x56) mm, 2mm thickness aluminium powder coated curtail wall frame shall be used for vertical frame. Aluminium profile and powder coated warranty shall be 10 years. YUNCHANG Brand or equivalent shall be used for aluminium frame.
- **Glass:** 8mm thickness blue tinted tempered glass shall be used. ASAHI Brand or equivalent shall be used.
- Handrail design shall be as shown on the Drawing.

21.3 Emergency Stair Typical Handrail (914mm Height)

- **Top Rail:** SS 304 (50.8 mm Ø), 1.2 mm thickness circular stainless steel handrail shall be used.
- **Post:** SS 304 (38.1mm Ø), 1.2mm thickness circular stainless steel stanchion shall be used.
- **Middle and Bottom Rail:** SS 304 (32 mm Ø), 1.2mm thickness circular stainless steel rail shall be used.
- Handrail design shall be as shown on the Drawing.

21.4 Cantilever Portion Stair Handrail (914 mm Height)

- **Top Rail:** SS 202 (50.8 mm Ø), 1.2 mm thickness circular stainless steel handrail shall be used.
- **Post:** SS 202 (38.1mm Ø), 1.2mm thickness circular stainless steel stanchion shall be used.
- **Middle and Bottom Rail:** SS 202 (32 mm Ø), 1.2mm thickness circular stainless steel rail shall be used.
- Handrail design shall be as shown on the Drawing.

21.5 Outdoor Corridor Typical Handrail (914mm Height)

- **Top Rail:** SS 304 (50.8 mm Ø), 1.2 mm thickness circular stainless steel handrail shall be used.
- **Post:** SS 304 (38.1mm Ø), 1.2mm thickness circular stainless steel stanchion shall be used for middle stanchion and SS 304 (50.8mm Ø), 1.2 mm thickness circular stainless steel stanchion shall be used for edge stanchion.
- **Middle Rail:** SS 304 (25.4 mm Ø), 1.2mm thickness circular stainless steel rail 4 No shall be used for middle rails.
- **Bottom Rail:** (150x150) mm brick kick block shall be built.
- Handrail design shall be as shown on the approved shop drawings.

21.6 Penthouse Floor Level Parapet Handrail (305mm Height)

- **Top Rail:** SS 304 (76.2 mm Ø), 1.2 mm thickness circular stainless steel handrail shall be used.

- **Post:** SS 304 (50.8 mm Ø), 1.2mm thickness circular stainless steel stanchion shall be used.
- Handrail design shall be as shown on the approved shop drawings.

22. EXTERNAL FAÇADE

22.1 Sub Breaker at outdoor corridor of typical floor

- **Frame:** (101.6x50.8) mm, 2mm thickness white colour aluminium powder coated frame shall be used for vertical and horizontal frame. Aluminium profile and powder coated warranty shall be 10 years. YUNCHANG Brand or equivalent shall be used.
- **Glass:** 5mm thickness blue tinted tempered glass shall be used. ASAHI Brand or equivalent shall be used.
- Sun breaker design shall be as shown on the Drawings.

22.2 Sun Breaker at windows of typical floor

- **Vertical Frame:** (50.38x50.8) mm, 2mm thickness M.S hollow section shall be used.
- **Horizontal Frame:** (101.6x50.8) mm, 2mm thickness M.S hollow section shall be used.
- **M.S Plate:** 127 mm width, 12.7mm thickness M.S plate shall be used.
- **Painting work:** All M.S hollow member shall be painted red oxide 1 coat and oil paint 2 coats. (4 PG) PREMIER Brand or equivalent shall be used. Colour shall be described by the Project Manager.

22.3 Verandah Transparent Roof

- **Frame:** H-100x100x6x8 mm H-section and (100x50) mm, 2.3mm thickness M.S rectangular hollow section shall be used.
- **Glass:** 12mm thickness mild steel gusset plate shall be used.
- **Bolt & Nut:** M-40x125mm length stainless steel bolt & nut shall be used.
- **Tie Rod:** 101.3 mm Ø, 4mm thickness M.S circular hollow section shall be used.
- **Roof:** 12mm thickness blue tinted tempered glass shall be used for roof. .
- **Painting work:** All M.S members shall be painted red oxide 1coat and oil paint 2 coats. (UPG) PREMIER Brand or equivalent shall be used. Colour shall be approved by the Project Manager.
- Dimensions and design shall be as shown on the drawings.

22.4 Glass Sun Shade A

- **Frame:** SS304 (101.6x50.8) mm, 1.2 mm thickness stainless steel hollow section shall be used.
- **Roof:** 12mm thickness blue tinted tempered glass shall be used for roof.
- Dimensions and design shall be as shown on the Drawings.

22.5 Spiral Stair at Roof Slab

- **Main core:** (162.5x5mm) C.H.S spiral stair main core shall be used.
- **Rail & Post:** SS 304 (38mmØ), 1.2 mm thickness stainless steel circular section shall be used.
- **Tread Frame:** Angle (50.8x50.8) mm, 6mm thickness M.S angle shall be used. M.S angle trade frame shall be painted red oxide 1 coat and oil paint 2 coats. (UPG) PREMIER Brand or equivalent shall be used for enamel paint.
- **Tread:** 6mm thickness chequer plate shall be used.

23. GLASS CURTAIN WALL

(GP4, GP5, GP1d, GP1b, GP2, GP2*, GP2c, GP3, GP3c, GP5b, GP1a, GP1c,)

- **Frame:** (106x56) mm, 2mm thickness gray colour aluminium powder coated curtain wall frame shall be used for vertical frame and (69x50) mm, 2mm thickness gray colour aluminium powder coated curtain wall frame shall be used for horizontal frame. Aluminium profile and powder coated warranty shall be 10 years. YUNCHANG Brand or equivalent shall be used.
- **Glass:** 8mm thickness blue tinted tempered glass shall be used. ASAHI Brand or equivalent shall be used.
- **Silicon:** Silicon warranty shall be 5 years. Dow corning Brand or equivalent shall be used.

24. ROOFING WORK

24.1 Roofing Sheet: 750 mm width, 0.42 mm thickness colour metal sheet shall be used for Ground Tank Roof and Car Parking Roof.

24.2 Ridging: 450mm width, 0.42 mm thickness colour metal ridging sheet shall be used for Ground Tank Roof.

24.3 Pyingado wood member for Ground Tank Roof.

- **Ridge Tie beam:** (100x50)mm Pyingado wood shall be used.
- **Rafter:** (100x50) mm Pyingado wood shall be used.
- **Purlin:** (100x50) mm Pyingado wood shall be used.
- Spacing for Rafter and Purlin shall be as shown on the drawings.

24.4 Pyingado Eave Board work for Ground Tank Roof

- **Eave Board:** (150x25) mm Pyingado wood shall be used.
- **Painting work:** Pyingado Eave Board shall be painted putty 1 coat, red oxide 1 coat and oil paint 2 coats. (UPG) PREMIER Brand or equivalent shall be used

25. STEEL STRUCTURE WORK FOR CAR PARKING

- 25.1.1 20 mm ϕ L-600mm Anchor Bolt
- 25.1.2 8 mm thick MS Plate
- 25.1.3 3.2 mm thick 100mm ϕ MS Pipe
- 25.1.4 2.8 mm thick 75mm ϕ MS Pipe
- 25.1.5 2.8 mm thick 50mm ϕ MS Pipe
- 25.1.6 2.3 mm thick 40mm ϕ MS Pipe
- 25.1.7 2.3 mm thick (100x50)mm Lip C channel
- 25.1.8 Painting work for steel truss

- Steel truss shall be painted red oxide 1 coat and oil paint 2 coats. (UPG)PREMIER Brand or equivalent shall be used.
- Steel structure work shall be as shown on the drawings.

26. GRAVEL FILLING WORK FOR SEPTIC TANK

- Location shall be as shown on the drawings.

27. PRECAST CONCRETE BLOCK FOR SEPTIC TANK

- 279x279x75mm, 150x150x150mm, 150x75x150mm precast concrete blocks shall be used at described location.

28. SIDE DRAIN AND APRON WORK

- Materials and design shall be as shown on the drawings.

- Grade 15 concrete shall be used for lean concrete.
- Grade 25 concrete shall be used for 75 mm thick Apron.
- Iron grill Drain cover work.
 - Angle (50.8x50.8) mm M.S angle shall be used for main frame and 10mm Ø M.S rod shall be installed at 25.4 mm c/c along main frame.
 - Iron grill drain cover shall be painted red oxide 1 coat and oil paint 2 coats. (UPG) PREMIER Brand or equivalent shall be used.

29. Concrete Paving, Car Parking Floor and Internal Road Side Drain

There shall be made as shown on the Drawings.

Road side drain shall be well drain.

-Concrete: 25 Grade Ready mixed concrete shall be used.

-Brick: First class brick shall be used.

-Cement mortar: 1:3 Cement mortar shall be used for brick work and plastering work.

30. Landscaping

- Location is shown on the Drawings.
- Japan Grass (Flat leaf), Ixora Plant (Large) and Ixora Plant (Small) shall be planted as shown on the Drawings.

**B. TECHNICAL SPECIFICATIONS FOR MECHANICAL WORKS
(SPECIFICATION FOR WATER SUPPLY, SANITATION SYSTEM)**

GENERAL

- 31 FIXTURE AND FITTING; INCLUDING FIXING FINISHING MATERIALS
- 32 WATER SUPPLY SYSTEM
- 33 COLD WATER PIPE INCLUDING FITTINGS AND ACCESSORIES TO COMPLETE WORKS
- 34 DRAINAGE SUPPLY SYSTEM
- 35 RAIN WATER DRAINAGE SYSTEM

SPECIFICATION FOR FIRE PROTECTION SYSTEM

GENERAL

- 36 FIRE HOSE REEL SYSTEM
- 37 GI PIPE C/W FITTINGS, RUNNING JOINTS AND FIXING

SPECIFICATIONS FOR WATER SUPPLY, SANITATION SYSTEM

GENERAL

This specification calls for the supply of equipment, materials apparatus, labor and instructions for the construction of complete, ready to operate systems in accordance with the drawings and this specification for project.

The main features of the work include but are not necessary limited to the supply and installation of the following.

- a) Water Pump, Sewage Pump
- b) Piping , Valve and accessories and miscellaneous work for piping system
- c) Sanitary drainage, including vent pipes
- d) Building water service systems including piping to equipment, plumbing fixture and faucets
- e) Plumbing fixtures, hose faucets, valves and toilet room accessories
- f) Roof and floor drains system
- g) Miscellaneous as outlined on the drawings.
- h) Electrical power and controls.
- i) Testing adjusting and balancing.
- j) Provide, supply and installation of electrical control panel for system.

WATER SUPPLY & SANITATION INSTALLATIONS

31 Fixture and fitting; including fixing and finished materials Toilet Accessories

- 31.1 Water Closet (Western)
 - Two pieces Toilet (3/ 4.5 LPF)
 - Wash down Flushing Action
 - Dual Flush
 - Slow Closing Seat and Cover
 - Minimum Pressure (0.5 ~ 5 Kg/cm^2)
 - Floor to : 100 mm , P-Trap
 - Size (690 x 360 x 760) mm
 - White Color
 - One Year Warranty(Starting from hand-over date)
- Water Closet (Western)
 - Two pieces Toilet (3/ 4.5 LPF)

- Wash down Flushing Action
- Dual Flush
- Slow Closing Seat and Cover
- Minimum Pressure (0.5 ~ 5 Kg/cm^2)
- Wall to : 305 mm , S-Trap
- Size (690 x 360 x 760) mm
- White Color

31.2 Mirror

- Size (650 x 750) mm
- De-Mist Function

31.3 Toilet Paper Holder

- Size (129 x 66 x 65) mm
- Stainless Steel

31.4 Hand Spray

- Pressure (0.5 ~ 5 Kg/cm^2)
- Chrome Finished, 120 cm Hose with Holder

31.5 Basin with Stand

- Size W430 x L480 x H800 mm
- Wash Basin with Pedestal
- White Color
- Ceramic

31.6 Water Tap for Basin

- Pressure (1 ~ 5 Kg/cm^2)
- Stainless Steel
- Cold Water Faucet

31.7 Towel Rail

- Size (605 x 70 x 68) mm
- Stainless Steel

31.8 Urinal

- Size (460 x 370 x 686) mm
- Wall Mounted Type
- Pressure (0.5 ~ 5 Kg/cm^2)
- Top Inlet Urinal
- White Color
- Ceramic

31.9 Dividing Screen between Urinal

- Size (450 x 900) mm
- High Pressure Laminate (12 mm) Divider
- Wall Mounted divider with Stainless Steel Bracket

31.10 Kitchen sink

- Size (1200 x 500) mm

- Double Drainer
- Stainless Steel

31.11 Water Tap for Sink

- Pressure (1 ~ 5 Kg/cm^2)
- Stainless Steel
- Cold Water Faucet

32 WATER SUPPLY SYSTEM

Pump connection, Domestic Ground Tank & Septic Tank c/w valves, pipe connections and all necessary materials

32.1 Submersible Sewage Pump

Q = 1.0 L/s , H = 6 m , HP = 0.25 HP

The submersible pumps shall be wet installation in sump pits. Hydraulic parts of the pump are rated to design for heavy duty point. The pump operation is automatic and manual.

The impeller shall be a vortex type, and statically and dynamically-balanced in factory.

The pump operation shall be controlled by fluid level, and provided with a low-level protection.

Key equipment parameters are as follows.

Casing	: cast Iron
Impeller	: Vortex type
Shaft	: Stainless Steel
Seal	: Silicon carbide double Mechanical shaft seals
Motor	: 0.25 KW, 3000 rpm, 220 V, 1 Phase, 50 Hz,
Warranty	: One Year Warranty (Starting from hand-over date)

32.2 Domestic Pump; with Motor

Q = 2.0 L/s, H = 33 m, HP = 1.5 HP

The water pumps shall be single-stage or multi-stage pumps, split case, end suction or vertical in-line type, and electrically driven. The pumps shall be designed for heavy duty operation suitable for water at temperatures 0°C to 80°C. Total design efficiency shall not be less than 70 percent.

Key equipment parameters are as follows:

Casing	: Stainless Steel
Impeller	: Stainless Steel
Shaft	: Stainless Steel
Seal	: Mechanical seal
Motor	: 1.5 KW, 3000 rpm, 380 V, 3 Phase, 50 Hz
Warranty	: Two Year Manufacturer Warranty (Starting from hand-over date)

- 32.3 Electrical power
Domestic Pump; with Motor
Q = 2.0 L/s, H = 33 m, HP = 1.5 HP

Electrical power and control circuits to equipment, including connection to control panels, interconnecting wiring, cables, cable containment, relays, contactors, sensors, thermostats and control devices all necessary instruments and accessories as appropriate, fixing, earthing continuity, etc. to form a complete operational system.

1.5 KW Auto System Control Panel for 2 Nos of Pump in One Box Including

- Low Level Start / High Level Stop System for Over Head Tank
- Alternative & Parallel Running System
- Low Level Stop System for Ground Tank
- Electrode Holder (2) Nos

33 Cold Water Pipe including fittings and accessories to complete works

Cold Water Pipes shall be Polyvinyl Chloride (PVC) Pipe and fitting according to pressure class 13.5 Kg/cm² as a minimum or conforming to TIS 17-2523 Class 13.5 Kg/cm² and TIS 94-2517 Pipe Fitting Standard or equivalent.

33.1 **uPVC pipe ø 80 mm**

33.2 **uPVC pipe ø 50 mm**

33.3 **uPVC pipe ø 40 mm**

33.4 **uPVC pipe ø 32 mm**

33.5 **uPVC pipe ø 25 mm**

33.6 **uPVC pipe ø 20 mm**

33.7 **uPVC pipe ø 15 mm**

VALVE AND ACCESSORIES

All valves shall be designed for a working pressure at least 150 psig. Valve shall be operated by means of a hand wheel in clockwise rotation to close the valve.

Valves of sizes up to 3 inch. (80mm) shall have non rising stem, solid wedge disc, inside screw, Cast Iron body and bonnet, Non asbestos sand screwed ends to ANSI or ASME standards.

The valves shall be suitable for installation in horizontal and vertical positions.

The size of check valve shall be equal to that of the adjoining pipe. The valve shall be designed for a working pressure at least 150 psig.

Foot valves shall be in protection of dry-run conditions and shall be in silent operation. The valve shall have cast iron or ductile iron body in full-flow area, Cast

Iron strainer or screen, and flanged end.

- Material : Cast Iron Body
- Pressure rating : PN 10
- Plate : SS 304 Steam and gate, galvanized Steel bolts & nuts, hand wheel operated.
- Warranty : One Year Warranty (Starting from hand-over date)

Gate Valve ø 80 mm

Gate Valve ø 50 mm

Foot Valve ø 50 mm

Check Valve ø 50 mm

- Material : Brass Body
- Pressure rating : 150 Psi
- Warranty : 1 Year

Gate Valve ø 40 mm

Gate Valve ø 32 mm

Gate Valve ø 25 mm

Gate Valve ø 20 mm

Gate Valve ø 15 mm

33.8 Domestic Tank Connection (2m x 1m x 1mH) 2m³ = 400 Gal

Domestic Tank Shall be made of Glass Reinforced Polyester (GRP) or Overhead water tank connection c/w pipe connections, puddle flange, vent pipes, all float valves, fittings, fixings;

Standard : Singapore Standard SS245:1995 Cross reference to British Standard BS 7491 Part 3:1994 and BS EN 13280:2001

Materials : Resin- Isophthalic unsaturated polyester resin conforming to BS 3532 specification

Fiber Glass- low alkali fiber glass conforming to JIS R3411 to R3417 or BS 3396, BS 3496 and BS 3749 specifications

Testing Method:

BS2782

Manufacturing Process:

SMC hot pressed compression moulding

Warranty (lifetime) for steel material - 30 Years warranty

34 DRAINAGE SUPPLY SYSTEM

uPVC Pipe including fittings and accessories to complete works

Soil, Waste and Vent Pipes shall be Polyvinyl Chloride Pipe (PVC) pipe and fitting according to pressure class 8.5 Kg/cm² as a minimum or conforming to TIS 17-2523 Class 8.5 Kg/cm² and TIS 94-2517 Pipe Fitting Standard or equivalent.

- 34.1 **uPVC pipe ø 50 mm**
- 34.2 **uPVC pipe ø 80 mm**
- 34.3 **uPVC pipe ø 100 mm**
- 34.4 **Septic tank Connection**

The Unit comprises of Septic Tank shall be made with Up flow anaerobic Filter. Septic Tank can be constructed R.C.C Foundation Slab & R.C.C Wall. Septic Tank size is designed for 140 Persons and air ventilation of 4"ø CI Swan Neck . If the septic tank is deep below ground level, Brick Work is to be made to take the entrance of manhole to the top of ground level. Septic tank shall be closed with R.C.C Precast Slab Cover. In the inlet chamber a baffle wall is provided to prevent entry of foam to the sedimentation zone. The outlet of septic tank shall be absorbed by pumping to drain, including connection to all detail on drawing. The detention time adopted in septic tank is in between 1 day to 2.5 days. De-slugging of septic tank is usually once in a year.

35 RAIN WATER DRAINAGE SYSTEM

uPVC Pipe including fittings and accessories to complete works

Rain Water Pipes shall be Polyvinyl Chloride Pipe (PVC) pipe and fitting according to pressure class 8.5 Kg/cm² as a minimum or conforming to TIS 17-2523 Class 8.5 Kg/cm² and TIS 94-2517 Pipe Fitting Standard or equivalent.

- 35.1 **uPVC pipe ø 80 mm**
- 35.2 **uPVC pipe ø 100 mm**

SPECIFICATIONS FOR FIRE PROTECTION SYSTEM

GENERAL

This specification calls for the supply of equipment, materials apparatus, labor and instructions for the construction of complete, ready to operate systems in accordance with the drawings and this specification for project.

The main features of the work include but are not necessary limited to the supply and installation of the following.

- a) Fire Hose Reel Pump
- b) Piping system , Valve, accessories and miscellaneous work for piping system
- c) Fire hose, Fire department connection and accessories and miscellaneous equipments for Fire Fighting.
- d) Electrical power and controls.
- e) Testing adjusting and balancing.

- f) Provide, supply and installation of electrical control panel for system.
- g) All other items indicated on the contract drawings specified here in or required to provide complete operated, accessible and balanced System.

36 FIRE HOSE REEL SYSTEM

Pump sets; driving motor and casing; flexible connections to pipe work; anti vibration mountings; emergency stop push buttons; including all necessary accessories and Fire Pump Control Panel.

36.1 Fire Hose Reel Pump
 Q = 2.3 L/s, H = 35 m, HP = 2.0 HP

Casing	: Stainless Steel
Impeller	: Stainless Steel
Shaft	: Stainless Steel
Seal	: Mechanical seal
Motor	: 1.5 KW (2HP), 2900 rpm 380V, 3 Phase, 50Hz

36.2 Electrical power and control circuits to equipment, including connection to control panels, interconnecting wiring cables, cable containment, relays, contactors, sensors, and control devices, all necessary instrument sand accessories as appropriate, fixing, earthing continuity, etc. to form a complete operational system.
 Q = 2.3 l/s , H = 35 m , HP = 2.0 HP

- 2 HP DOL Control Panel with low pressure start / high pressure stop, alternative / parallel running system and dry running system include pressure switch

37 GI Pipes c/w fittings, running joints and fixing

Fire Water pipes shall be galvanized Iron pipe, conforming to Standard BS-1387. Elbows, tees, reducers shall be galvanized Iron threaded fittings conforming to Standard BS-1387.

37.1 **GI pipe ø 50 mm**

37.2 **GI pipe ø 25 mm**

VALVE AND ACCESSORIES

All valves shall be designed for a working pressure at least 150 psig. Valve shall be operated by means of a hand wheel in clockwise rotation to close the valve.

Valves of Sizes up to 2 inch. (50mm) shall have non rising stem, solid wedge disc, inside screw, Cast Iron body and bonnet, Non asbestos sand screwed ends to ANSI or ASME standards.

The valves shall be suitable for installation in horizontal and vertical positions.

Gate Valve ø 50 mm

- Material : Cast Iron Body
- Pressure rating : PN 10
- Plate : SS 304 Steam and gate, galvanized Steel bolts & nuts, hand wheel operated.
- Warranty : Minimum one year warranty (Starting from Hand-over date)

Gate Valve ø 25 mm

- Material : Brass Body
- Pressure rating : 150 Psi
- Warranty : Minimum one year warranty (Starting from Hand-over date)

- 37.3 Hose reel comprising with isolating gate valve, union at inlet connection complete with branch nozzle and all necessary accessories.

FIRE HOSE CABINET

Fire hose cabinet made of Mild steel sheet thickness not less than 1.5 mm, for outside building installation and red painted steel sheet thickness not less than 1.5 mm. for inside building installation, door and frame complete with safety glass.

Equipment inside Fire Hose Cabinet

- FIRE HOSE REEL shall comply with the followings:
 - a) Swing Manual Hose Reel c/w Chrome Coated Brass Nozzle
 - b) Sizing: 1 inch. (25 mm) Hose Reel, 30 m long
 - c) 300 PSI Test Pressure.
 - d) Underwriters Listed or Factory mutual approved or BS standard for fire protection work.
 - e) Complete with inlet valve, hose and nozzle.
 - f) Hose material: Red Epoxy polyester or synthetic.

C. TECHNICAL SPECIFICATIONS FOR ELECTRICAL WORKS

GENERAL

38. DISTRIBUTION BOARDS
39. METAL TRUNKING
40. CABLE TRAY
41. LIGHT FITTINGS AND SOCKET OUTLETS
42. MAIN DISTRIBUTION LINE CABLE & OTHER ACCESSORIES
43. LIGHTNING PROTECTION AND EARTHING SYSTEM
44. PASSENGER ELEVATOR
45. SPLIT TYPE AIRCONDITIONING SYSTEM

EXTRA LOW VOLTAGE SYSTEM

46. CLOSED CIRCUIT TELEVISION SYSTEM
47. PUBLIC ADDRESS SYSTEM
48. TELEPHONE AND DATA SYSTEM
49. FIRE ALARM SYSTEM

TECHNICAL SPECIFICATIONS FOR ELECTRICALWORKS

GENERAL

This general specification and requirement describe the materials and installation of the Electrical works for building services works and related work for the project. This specification defines the objectives, guidelines and requirements for supply, installation, implementation, testing and commissioning of electrical system.

- a) Low voltage Power Supply
- b) Main Distribution Boards
- c) Sub Distribution Boards
- d) LV Cable Distribution System
- e) Conduit, Metal Tray and Metal Trunking
- f) Lighting and Small Power System
- g) Lightning Protection and Earthing System
- h) Passenger Elevator
- i) Power and wiring to mechanical services
- j) Closed Circuit Television System
- k) Public Address System
- l) Telecommunication Network System,
- m) Fire Alarm System

38 LOW VOLTAGE POWER SUPPLY

38.1 MAIN DISTRUBTION BOARD (MDB)

Location	:	Indoor
Painting color	:	Dark grey
Type of paint	:	Powder painting
Capacity Range	:	To 1000A
Number of Phase	:	3 Phase
Frequency	:	50Hz
Voltage rating	:	To 500V
Thickness	:	1.2mm
Dimension level	:	According to equipment
Weight	:	According to equipment

MOULDED CASE CIRCUIT BREAKER (MCCB),/

MINIATURE CIRCUIT BREAKER MCB)

Location	:	Indoor
Standard	:	IEC 947-2
Color	:	Black/White
Capacity range	:	6A ~ 1600A /6KA ~50KA
Number of phase	:	As indicated on drawings
Frequency	:	50Hz
Voltage rating	:	440V

Dimension (LxWxH) : According to equipment
 Weight : According to equipment

- 38.2 Distribution Board – Ground Floor
- 38.3 Distribution Board – First Floor
- 38.4 Distribution Board – Second Floor
- 38.5 Distribution Board – Penthouse Floor
- 38.6 Distribution Board – Ground Floor Toilet
- 38.7 Distribution Board – First Floor Toilet
- 38.8 Distribution Board – Second Floor Toilet

39) METAL TRUNKING

Location : Indoor
 Standard : IEC-61537
 Painting color : Dark gray
 Type of paint : Powder painting
 Length : (2.4~ 3) m
 Dimension (W~W)x(H~H) : (50 ~ 200)x(50~100)mm
 Thickness : (1.0 ~ 1.2) mm
 Weight : According equipment

- 39.1 200mm x 100mm x 1 mm**
- 39.2 100mm x 50mm x 1 mm**
- 39.3 50mm x 50mm x 1mm**

40) CABLE TRAY

- 40.1) 200mmx 25mm x 1mm**

Location : Indoor
 Painting color : Dark gray
 Standard : IEC-61537
 Type of paint : Powder painting
 Length : (2.5 ~ 3) m
 Dimension (W~W)x(H~H) : (200 x25)mm
 Thickness : (1.0 ~ 1.2) mm
 Weight : According equipment

41) LIGHT FITTING

35W Halogen Down Light

Dimension : ø:180,H:25
 Finish : White
 Standard : IEC-60598-2-4
 Specifications : 35W 4000K 1645lm CRI>80
 Mounting Details : Spring Mounting Bracket
 Remarks : High-pressure aluminium die-cast housing
 Epoxy powder coating

9W PLC Down Light

Dimension	:	ø:180,H:25
Finish	:	White
Standard	:	IEC-60598-2-4
Specifications	:	LED E27 6500K
Remarks	:	Powder Coated Steel / Inner Ring can be Adjustable

18W PLC Down Light

Dimension	:	ø:180,H:25
Finish	:	White
Standard	:	IEC-60598-2
Specifications	:	LED E27 6500K
Mounting Details	:	18W 4000K 1656lm CRL>80
Remarks	:	Powder Coated Steel / Inner Ring can be Adjustable

Light Box

See detail @ Drawing No.(DWIR-3STY-PMU-SPIRAL STAIR AND LIGHT BOX
DETAIL-01)

Covelight

Location	:	Indoor
Standard	:	IEC-60598-2
Input Voltage	:	220 ~ 240 V
Frequency	:	50/60Hz
Color	:	Pure white
Color temperature	:	6000K ~6500K
Beam Angle	:	100 ° x 100 °
Luminous flux	:	1200 ~ 1500 Lm
Color Rendering index	:	80 (Ra)
Operating temperature	:	-30°C ~ 85°C
Storage temperature	:	-40°C ~ 85°C

40W Ring Lamp

Location	:	Indoor
Standard	:	IEC-60598-2
Input Voltage	:	220 ~ 240V
Frequency	:	50/60Hz
Power	:	40W
Color Rendering Index	:	85
Color Temperature	:	4000K
Luminous Flux	:	3300Lm

Chandelier

Location	:	Indoor
Standard	:	IEC-60598-2-4

Input Voltage	:	220 ~ 240V
Frequency	:	50/60Hz
Type	:	Chandelier
Material	:	Crystal lamp
Size	:	ø 600 mm x H 1000mm
Bulb	:	LED

4' 40W Fluorescent lamp (Twin)

Location	:	Indoor
Standard	:	IEC 60598
Input Voltage	:	220 ~ 240V
Frequency	:	50/60Hz
Power	:	40W
Type	:	LED (Twin)
Luminous Flux	:	3800 Lm
Lamp color temperature	:	3000K
Color Rendering Index	:	80 (Ra)
Color	:	White
Luminous efficacy	:	95Lm/W
Dimension	:	(1240 x 217 x 56)mm

Exhaust fan

Location	:	Indoor
Type	:	Ceiling type
Input Voltage	:	220 ~ 240 V
Frequency	:	50/60Hz
Fan size	:	250mm x 250 mm
Material	:	PVC
Phase	:	Single
Service Factor	:	1
Speed	:	1
Wings	:	5

Emergency Light

Location	:	Indoor
Standard	:	SS 563
Input Voltage	:	220~240V
Frequency	:	50/60Hz
Power Consumption	:	4W
Light Source	:	2 x 3W High Power LED (Cool White)
Batteries	:	4.8V 4.5Ah
Recharge Period	:	16 -24 Hours
Battery Protection	:	Low Voltage cut off to prevent over discharge
Charger	:	Constant Current
Monitoring	:	Green LED to indicate batteries charging

Exit Light

Location	:	Indoor
Standard	:	SS 563
Input Voltage	:	220~240V
Frequency	:	50/60Hz
Power Consumption	:	3W
Light Source	:	High output LED array
Batteries	:	2.4V 1.6AH high temperature
Recharge Period	:	16 -24 Hours
Battery Protection	:	Low Voltage cut off to prevent over discharging
Charger	:	Constant Current, Dual rate
Monitoring	:	LED Green indicates charging
Housing	:	Electro – galvanized sheet steel with power coated paint

SWITCH AND SOCKET OUTLET

Location	:	Indoor
Standard	:	IEC - 60969
Color	:	White
Material	:	Plastic
Type	:	Wall Mounted/ Under
Rated Voltage	:	230V/440V
Frequency	:	50Hz
Current	:	Max-16A
Spin	:	1P + 1N + 1E

42) MAIN DISTRIBUTION LINE CABLE

Location	:	Indoor
Standard	:	IEC – 60502-1
Color	:	Black
Conductor	:	CU/XLPE/PVC
Outer Sheath	:	PVC (type ST2)
Core No.	:	Single Core
Voltage Rating	:	(0.6)1kV
Max conductor	:	90°C
Temperature in normal use	:	
Nominal Area	:	(4 ~ 25) mm ²
Weight	:	According Area

42.1) 1Cx 25mm² Cu/XLPE/PVC Cable42.2) 1Cx16mm² Cu/XLPE/PVC Cable42.3) 1Cx10mm² Cu/XLPE/PVC Cable42.5) 1Cx4mm² Cu/XLPE/PVC Cable

43) LIGHTNING PROTECTION AND EARTHING SYSTEM

This system shall supply, install, connect, test and commission a complete system of safety grounding and lightning protection.

The material for grounding and lightning protection system shall consist of ground rods, ground conductors, grounds test boxes, lightning down conductors, lightning roof conductors, air terminals and accessories interconnected for the complete system.

- 1.1) Down Conductor & Roof Conductor shall be copper tape 25mm x 3mm thick
- 1.2) Lightning Finial with bracket (Air Terminal) shall be copper clad steel ϕ 16mm x 0.6m.
- 1.3) Groundrod shall be copper clad steel, ϕ 16mm x 3m.
- 1.4) Grounding resistance of Grounding system shall not be greater than 2 ohms.

44) PASSENGER ELEVATOR

General Specification

Type	:	Passenger
Quantity	:	1 Set
Capacity	:	1000Kg
Speed	:	60 meter / min
Machine room high	:	4500mm
Overhead	:	4600mm
Pit depth	:	1500mm
Hoistway size	:	2200mm (width) x 2000mm (depth)
No.of floor	:	4 Floors
No.of Stop	:	4 Stops
Service floor name	:	Ground ~ Penthouse (1 ~ 4)
Control system	:	AC Variable Voltage, Variable frequency control (Distributed inverter control)
Operation	:	Simple & Control /access control
Power supply	:	AC 15kW, 400V, 3phase, 50Hz for power AC 220V , 1 phase , 50Hz for Lighting
Lift shaft cooling	:	Air condition 1.5 HP to be provided at machine room
Counter weight	:	Cast Iron

Cage Side

Car inside dimension	:	1600mm (W) x 1500mm (D)
Opening Type	:	Automatic two panel center opening
Opening size	:	1000mm (W) x 2100mm (H)
Cage door	:	Stainless steel hair line finish
Cage Wall	:	Stainless steel hair line finish
Car illumination	:	As build (Supplier standard)
Operation panel board	:	Micro push button type
Flooring	:	Deco tile

Door still	:	Extruded hard aluminum
<u>Wall Side</u>		
Jamb	:	Level 1 Wide Jamb withtrans panel in stainless Steel hair line finished Other Narrow jamb without trans panel in stainless steel hair line finished.
Opening Type	:	Automatic two panel center opening
Opening size	:	1000mm (W) x 2100 mm (H)
Opening panel board	:	Micro push button type
Handrail	:	Supplier's standard

Signal

Car position indicator	:	Vertical digital type indicator on the OPB
Hall position indicator	:	Horizontal digital type indicator tor typical floor
Inter phone	:	Provide among cage, machine room caretaker's space
Arrival gong	:	C. chime

Safety Devices and Special features

1. Retractable one safety shoe for the full height of the door with re-opening the door when it is obstructed by any object while choosing.
2. Emergency car light during 30 minutes of power failure and charges by trickle charger.
3. Inter phone and alarm buzzer system among cars and machine room.
4. Audible overload portative device.
5. Fan with provided forced quite ventilation from car top and is concealed by drop ceiling.
6. Emergency exit.
7. Emergency stop and call button provided on car operation panel board.
8. Light and fan switches provided at the switch box of car operation panel board.
9. Inspection station provided on the top of the car.
10. Up and down directional arrow provided on the car operation panel board.
11. Photocell shall be provide.

Shop Drawings

The contractor shall submit the documentation about the proposed manufacturer for Project Manager's approval before commencement of construction of the shafts for elevator so the approved manufacturer's requirement can be incorporated in the construction. Similarly, the Contractor shall submit the shop drawings for interior design for approval in a timely manner to incorporate the Project Manager's comments into the interior design. The approval of the Manufacturer and the shop drawings should not remove the Contractor's responsibility.

Warranty

Manufacturer warranty for 5 years for the major components including the pump unit

(Consisting of the tank, motor, valve and pump), controller, swing door assemblies, interlocks, hydraulic cylinder, hydraulic hose, sheave block assembly, hoist ropes and shackles, operating devices such as limit switches, pushbutton assemblies and key switches is required.

Maintenance Manual

The contractor shall provide a maintenance manual to enable the Employer to maintain the lift properly and give training to the Employer’s designated technicians in maintenance of the lift.

45) AIR CONDITIONING SYSTEM

Split Type (1HP)

Location	:	Indoor
Control Type	:	Wireless remote control
Color	:	White
Type	:	Non-Inverter R410A (Single split type)
Cooling capacity	:	9000 Btu/h
Cooling capacity	:	2.65kW
EER (Cooling)	:	3.27kW
Power Consumption	:	2.28kW
Dimension (IU) (HxWxD)	:	268 x 840 x 203
Dimension (OU) (HxWxD)	:	368 x 500 x 490
Net weight	:	8.5/24
Piping Connection	:	Liquid/ Gas

Split Type (2HP)

Location	:	Indoor
Control Type	:	Wireless remote control
Color	:	White
Type	:	Non-Inverter R410A (Single split type)
Cooling capacity	:	17,700 Btu/h
Cooling capacity	:	5.2 kW
EER (Cooling)	:	3.25kW
Power Consumption	:	1.6kW
Dimension (IU) (HxWxD)	:	(320 x 998 x 238) mm
Dimension (OU) (HxWxD)	:	(620 x 790 x 290) mm
Net weight	:	14/41
Piping Connection	:	Liquid/ Gas

Split Type (3HP)

Location	:	Indoor
Control Type	:	Wireless remote control

Color	:	White
Type	:	Non-Inverter R410A (Single split type)
Cooling capacity	:	24,200 Btu/h
Cooling capacity	:	7.10kW
EER (Cooling)	:	3.11kW
Power Consumption	:	2.28kW
Dimension (IU) (HxWxD)	:	320 x 998 x 238
Dimension (OU) (HxWxD)	:	620 x 790 x 290
Net weight	:	14/41
Piping Connection	:	Liquid/ Gas

Shop Drawings

The contractor shall submit for engineer's approval of such shop drawings to be incorporated in the work as required before commencement of installation of any approved equipment and material.

Maintenance Service:

The Contractor (or via manufacturer) shall provide maintenance manual and train the Employer's technician in maintaining the air conditioners. After handover, free of charges, the Contractor shall provide maintenance service for 1 year, including the spare parts, consumables, cleaning and any other servicing required according to normal maintenance program. In addition, the maintenance service for 2 year shall be provided without spare parts.

Warranty

Manufacturer's warranty for two years should be provided.

46) CLOSED CIRCUIT TELEVISION SYSTEM

General Requirement

This is the equipment for surveillance and security purpose. The system monitored the inside of office building and aimed at the early incident and situation grasp and record.

Equipment Specification

- 1) CCTV System: Conventional System
- 2) CCTV Monitor Rack shall be provided in Control Center at second floor.
- 3) Digital Disk Recorder, Video Color Multiplexer, Matrix Video Switcher, Power Control Unit. UPS (10 min) and necessary equipment shall be integrated in CCTV Monitor Rack.
- 4) Camera: Indoor Dome Camera, CCD
- 5) Outdoor Camera, CCD

Outdoor Fixed Camera

Location	:	Outdoor
Image Sensor	:	1/2.8 in Progressive scan CMOS

Max. Resolution	:	1920 x 1080
Lens	:	2.8mm@F2.0,horizontal field of view 105.8° 4mm @ F2.2, horizontal field of view 83.6° 6mm@F2.0,horizontal field of view 55°
Lens Mount	:	M12
Day & Night	:	IR cut filter with auto switch
3-Axis Adjustment	:	Pan:0° to 360° , tilt : -90° to 90° , rotation 0° to 360°
DNR(Digital Noise Reduction)	:	3D DNR
WDR(Wide Dynamic Range):	:	Digital WDR
IR Range	:	Up to 30m
Ingress Protection	:	IP67
Video Compression	:	Main Stream: H.264+/H.264 Sub stream: H.264/MJPEG
Video Bit Rate	:	32 Kbps to 8 Mbps
Operating Conditions	:	-30°C to 60°C (-22°F to 140°F), humidity 95% or less (non-condensing)
Power Supply	:	12VDC+_ 25%, Poe (802.3af)
Power Consumption	:	Max.5W/6.5W (PoE)

Indoor fixed Camera

Location	:	Indoor
Image Sensor	:	1/2.8 in Progressive scan CMOS
Max. Resolution	:	1920 x 1080
Lens	:	2.8mm@F2.0,horizontal field of view 105.8° 4mm @ F2.2, horizontal field of view of 83.6°
Lens Mount	:	M12
Day & Night	:	IR cut filter with auto switch
3-Axis Adjustment	:	Pan:0° to 355° , tilt : 0° to 70°
DNR(Digital Noise Reduction)	:	3D DNR
WDR(Wide Dynamic Range):	:	Digital WDR
IR Range	:	Up to 30m
Video Compression	:	Main Stream: H.264+/H.264 Sub stream: H.264/MJPEG
Video Bit Rate	:	32 Kbps to 8 Mbps
Ingress Protection	:	IP67/IK10
Operating Conditions	:	-30°C to 60°C (-22°F to 140°F), humidity 95% or less (non-condensing)
Power Supply	:	12VDC+_ 25% , Poe (802.3af)
Power Consumption	:	Max.5W

Indoor Dome Camera

Location	:	Indoor
Image Sensor	:	1/2.8 in Progressive scan CMOS
Max. Resolution	:	1920 x 1080
Lens	:	2.8mm@F2.0,horizontal field of view 105.8° 4mm @ F2.2,horizontal field of view of 83.6°
Lens Mount	:	M12

Day & Night	:	IR cut filter with auto switch
3-Axis Adjustment	:	Pan:0° to 355° , tilt : 0° to 70°
DNR (Digital Noise Reduction)	:	3D DNR
WDR (Wide Dynamic Range):	:	Digital WDR
IR Range	:	Up to 30m
Video Compression	:	Main Stream: H.264+/H.264 Sub stream: H.264/MJPEG
Video Bit Rate	:	32 Kbps to 8 Mbps
Ingress Protection	:	IP67/IK10
Operating Conditions	:	-30°C to 60°C (-22°F to 140°F), humidity 95% or less (non-condensing)
Power Supply	:	12VDC+_ 25%, Poe (802.3af)
Power Consumption	:	Max.5W

Network Video Recorder

Location	:	Indoor
PoE Port	:	24 x 10/100 Mbps
Uplink Ports	:	2 x 1000M combo port
Switching Capacity	:	8.8 Gbps
Max Forwarding Rate	:	6.55 Mpps
Forwarding Mode	:	Store and Forward
MAC Address Table	:	4K
Working mode	:	Extend on: 250m, 10M, CAT 5e Extend off: 100m
Power Supply	:	100 to 240V AC , 50/60 Hz
Power consumption	:	440W
Surge Protection	:	4KV
Working Humidity	:	10% to 90%, non condensing
Storage Humidity	:	5% to 90% ,non condensing

4GB Surveillance Purple Hard Drive

Location	:	Indoor
Video Input	:	IP Video Input (32-Ch)
Audio input	:	Incoming bandwidth (320Mbps) Outgoing bandwidth (256 Mbps or 200)
Decoding	:	Decoding Format (H.265/H.264+/MPEG) Recording resolution (12MP/8MP) Synchronous playback (16-ch) Capability (4-ch @ 4K or @ 1080p)
Hard Disk	:	SATA - 16 SATA interfaces) eSATA -1 eSATA interface Capacity – 500GB/1TB/2TB/3TB/4TB
Power Supply	:	100 to 240V AC , 50 to 60 Hz
Max Power	:	300W
Power Consumption (Without Hard Disk)	:	45W
Working Humidity	:	10 to 90%
Chassis	:	19- inch rack-mounted 3U chassis

L2 unmanagedPoE Switch

Optional 820 ft (250m) Extended Transmission Mode

24 x 10/100 Mbps Auto-MDIX Ports

Up to 30W per PoE Port ,PoE Power Budget 370W

4KV Surge Protection

Plug and play installation

8.8 Gbps Switching Fabric

2.75 mbitsRaM Data Buffer

4K MAC Address Entries

Sturdy Metal Enclosure

47) PUBLIC ADDRESS (PA) SYSTEM

Ceiling Speakers

Location	:	Indoor
Rated Input	:	6W/10W
Rated impedance	:	1.7k ohms (6W)
Sensitivity	:	90dB (1W/1m)
Frequency Response	:	100-16000Hz
Speaker Component	:	12cm dynamic cone-type speaker
Speaker Mounting Method	:	Spring catch
Applicable cables	:	600V vinyl-insulated cable
Finish	:	Grille: Fire –resistant, high – impact

BoxCeiling Speakers

Location	:	Indoor
Rated Input	:	3W/10W
Rated impedance	:	1.7k ohms (6W)
Sensitivity	:	90dB (500 -5000Hz, pink noise)
Frequency Response	:	150-20000Hz (peak -20dB)
Speaker Component	:	16cm double cone-type
Applicable cables	:	600V vinyl-insulated cable
Connection	:	Push-in connector (birding terminal)
Finish	:	Baffle: HIPS resin, off-white (RAL 9010 or
Equivalent color)		

Pre-amplifier Mixer Panel

Location	:	Indoor
Power source	:	Usable power supply unit (24V-DC)
Current Consumption	:	110mA
Audio Input	:	EV:-20dB *,600Ω, unbalanced,Removable terminal block (2 pins)

Timer:-20dB*,600Ω unbalanced Removable

Paging: -60/-20 dB * , (selectable),600Ω ,balanced Removable terminal block (3 pins)

AUX1-2 : -20 dB *,10kΩ ,unbalanced , RCA jack

Audio Output : Priority output: 0dB*, balanced, Removable
 Terminal block (3 pins) BGM output: 0dB*, balanced, Removable terminal block (3 pins)
 Control Input : Timer ; No- Voltage make contact input , open voltage:24V DC ,
 short circuit current : under 5 mA , Removable terminal block (2 pins) Paging : EV-No
 voltage make contact input , open voltage : 24V DC ,short circuit current : Under 5 mA ,
 Removable terminal block (2 pins)
 Control Output : All call: Contact switch (Normally open), Removable terminal block
 (2 pins)
 Frequency Response : **50Hz-15kHz,±3 dB** , 1kHz
 Muting : MIC/input1: Mutes other input signals (Mic/line 2-4 ,AUX1-21 by
 0-30 dB attenuation
 Phantom power : MIC/INPUT1 (Selectable) (**±21 V DC**)
 Priority Control : Fireman's, microphone>EV>Timer>Paging Remote microphone
 microphone>Mic/Line1>Mic/Line 2-4& AUX1-2
 Tone control : Bass: -10dB at 100 Hz(for Input BGM)
 S/N Ratio : Over 60dB
 Distortion : Under 1% (1kHz , rated output
 LED Indicator : Power (Green)
 Operating temperature 0°C to +40°C
 Operating Humidity Under 90% RH (no condensation)

240 Watt Power Amplifier

Location Indoor
 Rated output power 240 Watt
 Input 2 Input, 0dB* , 230kΩ
 Power source 220 ~ 240V AC
 DC: 24V (Operating range : 19.5 – 27 V)
 Frequency 50/60Hz
 Power consumption AC at rated output: 55 W (Condition : AC 230V)
 Current consumption DC at rated output: 15A
 Speaker output m4 screw terminal, distance between batteries : 12mm)
 Control Output Fault output Make: Normal, Break : Error or Power off)
 S/N Ratio Over 60dB
 Frequency Response 80Hz – 15Hz, ±3 dB , 1KHz
 Ventilation Fan cooling
 Led Indicator Power (Green)
 Signal (Green)
 Peak (Red)
 Fault (Red)
 Dimensions 482 (W) x 88.4 (H) x 337.2 (D)mm

Remote Microphone

Location Indoor

Power source	24V DC (operating range 4-28 V DC)
Current consumption	100mA or less
Audio output	0dB (*1)
Distortion	1 % or Less
Frequency Response	100 – 20
S/N Ratio	60Db or more
Microphone	unidirectional electret condenser microphone
N10 of function	13
Connection cable and connector	Category 5
Dimension	90W x 76.5(H) x 215 mm

Monitor Panel

Location	Indoor
Power requirements	24 V DC
Current consumption	30 mA
Input	10 zone high impedance level: 100V line Level line: 40dBV (100V)
Speaker component	30 x 70 mm cone speaker 6W /8Ω
Monitor level	6- point LED display
Control panel	Channel selector switch, volume control switch
Accessory	Removable terminal plug (2 pins)...10

Line Supervisory Panel

It shall meet the minimum requirements as follows: Independent circuit supervising up to 10 zones;

LED status indication for short/open/normal circuit;

Speaker output short circuit protection;

Power requirement: 220-240V AC, 50/60Hz.

Amplifier Change-Over Panel

It shall meet the minimum requirements as follows:

To switch up to min. 5 power amplifiers with one spare amplifier; LED status indication;

Speaker output short circuit protection;

Power requirement: 220-240V AC, 50/60Hz.

18U Floor Standing Rack

Location	:	Indoor
Dimension	:	18U 600mm (Height) x600mm Width x 988mm (Depth)
Thickness	:	1.2mm
Colour	:	Grey/Black
Front Door	:	mesh
Rear Door	:	mesh
Maximum internal usable depth	:	716mm

48) TELEPHONE PABX SYSTEM

PABX Unit (6 Co, Ext 10 Line , Message Waiting Card&)

Location	:	Indoor
Main CPU	:	Cortex A-8 600MHz
Power Input	:	100V AC to 130V AC
2.2A/200VAC to 240V AC		
Frequency	:	50Hz/60Hz
Power Consumption	:	110W
External Backup Battery	:	External battery port is supported
Memory Backup duration	:	7 Years
Dialing	:	Trunk: Dial pulse (DP) 10pps,20pps Tone (DTMF) Extension: Dial pulse (DP) 10pps , 20pps (DTMF) Dialing
Mode conversion	:	DP-DTMF
Ring Frequency	:	20Hz/25Hz
Operating Environment	:	Temperature-0°C to 40°C
Humidity-10% to 90% (non-condensing)		
Conference call trunk		From 10x3 party conference call 4 x 8 party conference call
LAN port		10 BASE-T/100 BASE-TX(Auto MDI)
Extension connection cable	:	1 pair wire (D1,D2) or 2 pair wire
Air Cooling method	:	Fan

Main Distribution Frame

Location	:	Indoor
Type	:	(50P x 50P) Distribution Box
Material	:	Metal
Color	:	Dark Grey
Thick	:	1.2mm

Data Network System

8 Port Gigabite Switch

Location	:	Indoor
Device features	:	8 x 10 x 100Mbps Ethernet port
Data Transfer Rate	:	10Mbps (Half duplex),20Mbps (full duplex)
Power	:	Input:100/240V, 50/60Hz Output: 5V,0.6A Consumption :1.4Watt Max
Operating temperature	:	0-50°C
Operating Humidity	:	Max 90% (non –condensing)

16 port Gigabite Switch

Location	:	Indoor
Network Media	:	Ethernet cat 5 up to 100m

Gigabitethernet Cat 5e and 6 up to 100m

Data Rate	:	Ethernet 10Mbps /20Mbps Gigabite Ethernet 2000Mbps
Protocol/Topology	:	CSMA/CD star
Power consumption	:	10.1 Watt
Switch fabric	:	32Gbps
Power	:	100-240V AC
Frequency	:	50/60Hz
Temperature	:	Operating-0 [®] to 40 [®] C (32 [®] ~ 104 [®] F) Storage--10 [®] to 70 [®] C (14 [®] ~ 158 [®] F)
Humidity	:	Max90% (non-condensing)

Wifi Access Point

Location	:	Indoor
Operation Modes	:	Access point (AP), AP+WDS
SSID	:	Up to 4 SSIDs per band (AP mode)
Access control	:	Wireless encryption WEP,WPA/WPA2-PSK
Frequency	:	2.4GHz FCC 2.412-2.462GHz ETSI: 2.412-2.472GHz
Modulation	:	802.11b:CCK,DQPSK,DBPSK 802.11a/g/n:BPSK,QPSK,16- QAM,64-QAM sub carrier with OFDM
Wireless Channel	:	2.4GHz FCC 1-11,ESTI 1-13
Power	:	5GHz: FCC: 36,40,44,48,149,159 Input: 100-240V AC,50-60Hz,0.8A Output: 12V DC Consumption: 20Watts (Max)
Operating Temperature	:	0-40 [®] C (32 - 104 [®] F)
Operating Humidity	:	85% non-condensing

Router

Location	:	Indoor
CPU	:	Tilera Ti 1e-Gx 16 CPU (16- core,1.2GHz per core
Memory	:	Two SODIMM DDR slots, 2x 1GB
Ethernet	:	Tweleve 10/100/1000 Mbit/s Gigabite ehernet with Auto-MDI/X
Expansion	:	microUSBport,host and device mode
Storage	:	512MB onboard NAND
Temperature	:	Max ambient temperature 50 [®] C
Frequency	:	1.2GHz,70 [®] C 1GHz CPU core

49.) FIRE ALARM SYSTEM

- The fire detection and alarm system shall be of analogue addressable type as shown on the drawing or the sections. The system shall comprise Fire Alarm Control Panel (FCP), fire detectors , manuals station , fire alarm bells , battery charges , batteries, modules, color graphic display monitor and other items of equipment required for the complete and workable system.
- All smoke detectors shall be of the photoelectric (optical) type. The smoke detectors shall be an analogue addressable unit which continuously measures the products of combustion in the air generates a proportional analogue output to the FCP via the addressable detection cable loop.
- Manual call points shall be single action and shall be suitable for 24 volt DC operation. They shall have open circuit contacts arranged for surface fixing with the front cover finished in red .The contact shall close immediately after the glass is smashed.
- The fire alarm horns shall be designed for minimum ip55 rating in outdoors, open corridors or similar circumstance. Fire alarm horns shall be wide range type, corrosion proof for 24 Volt D.C operation and suitable for 20mm conduit entry. Fire alarm horns shall be in the range 400Hz to 4000Hz and the sound level shall in no case exceed 120dB (A).
- The type of fire detection and alarm cable shall be as follows.
- Addressable data loop : Twisted pair with shield FRC cable
- Initiating device circuit : 2 x 1.5mm² FRC
- Alarm notification circuit : 2 x 2.5mm² FRC
- Control signals : 2 x 1.5mm² FRC

Addressable Fire Alarm Panel

Location	:	Indoor
Color	:	Grey
Material	:	Powder painting steel
Type	:	Wall mounted
Display	:	LCD
Indications	:	LED
Input	:	230CAC 50HZ-1A
Rated voltage	:	24VDC Nominal (21-27VDC)
Capacity	:	2 to 8 Loops
Standby battery	:	2 x 12V 38AH
		Charging Voltage:Max 27.3V ± 0.3V
		Charging Current:Max 2A ± 0.1A

Sounder Output	:	Voltage: 21 to 27 VDC Current: 1A EOL Resistor : 4.7 K Ω Voltage: 21 to 27 VDC Current: 200mA EOL Resistor : 4.7 K Ω
Dimension	:	(484W x 850(H) x 192 (D))mm
Weight	:	Approx 32Kg (Exclude Battery)

Addressable Smoke Detector

Location	:	Indoor
Type	:	Under Ceiling
Normal IED Indication	:	Green (Blinking)
Alarm LED Indication	:	Red (Continuous)
Normal Rated Voltage	:	24VDC
Rated Voltage	:	9.6VDC to 30VDC
Maximum Air velocity	:	7.6m/s
Operating Temp Range	:	-10°C to + 50°C
Relative Humidity	:	95%RH, Non Condensing @ 40°C
Weight	:	According to equipment

Manual Call Point

Location	:	Indoor
Color	:	Red & White
Type	:	Wall Mounted
Standard	:	EN 54-1 : 2000
Rated Voltage	:	24VDC
Standby Current	:	0.6mA
Alarm Current	:	1.8mA
Operating Temp Range	:	-10°C to + 55°C
Relative Humidity	:	95%

Fire Alarm Bell

Location	:	Indoor
Color	:	Red
Material	:	Steel
Type	:	Wall mounted
Rated Voltage	:	19.2 to 28.8 VDC
Rating Current	:	20mA
Sound Level	:	95 dB at 3m (10ft)

Approval of Materials

All materials and equipment furnished by the Contractor shall be subject to inspection and approval of the Owner or the Construction Manager, within a period from the date of receipt of the instruction to proceed.

Approval of any drawings, material or works by the Project Manager will not remove the Contractor's responsibility under the Contract.

LIST OF DRAWINGS

(Soft copy of drawings provided to the bidders in CD)

Architectural Drawings		
No	Drawing No	Drawing Title
1	DWIR-3STY-PMU-LG01	Drawing legend
2	DWIR-3STY-PMU-L01	Project Location Plan
3	DWIR-3STY-PMU-L02	Site Location Plan
4	DWIR-3STY-PMU-L03	Building Layout Plan
5	DWIR-3STY-PMU-P01	Perspective View
6	DWIR-3STY-PMU-P02	Perspective View
7	DWIR-3STY-PMU-P03	Perspective View
8	DWIR-3STY-PMU-P04	Perspective View
9	DWIR-3STY-PMU-A01	Ground Floor Plan
10	DWIR-3STY-PMU-A02	First Floor Plan
11	DWIR-3STY-PMU-A03	Second Floor Plan
12	DWIR-3STY-PMU-A04	Penthouse Floor Plan
13	DWIR-3STY-PMU-A05	Roof Plan
14	DWIR-3STY-PMU-A06	Front Elevation
15	DWIR-3STY-PMU-A07	Back Elevation
16	DWIR-3STY-PMU-A08	Left Elevation
17	DWIR-3STY-PMU-A09	Right Elevation
18	DWIR-3STY-PMU-A10	Section Y-Y
19	DWIR-3STY-PMU-A11	Section Y'-Y'
20	DWIR-3STY-PMU-A12	Section X-X
21	DWIR-3STY-PMU-A13	Stair Key Plan
22	DWIR-3STY-PMU-A14	Main & Emergency Stair Section
23	DWIR-3STY-PMU-A15	Main & Emergency Stair Handrail Detail
24	DWIR-3STY-PMU-TOL-A01	Toilet Plan
25	DWIR-3STY-PMU-TOL-A02	Toilet Plan
26	DWIR-3STY-PMU-TOL-A03	Toilet Elevation
27	DWIR-3STY-PMU-TOL-A04	Toilet Section
28	DWIR-3STY-PMU-DW01	Windows & Glass Panels Detail
29	DWIR-3STY-PMU-DW02	Doors Detail

30	DWIR-3STY-PMU-DW03	Glass Panels & Fanlights Detail
31	DWIR-3STY-PMU-DW04	Glass Panels Detail
32	DWIR-3STY-PMU-SHD01	Sun Breaker & Handrail Detail
33	DWIR-3STY-PMU-SHD02	Sun Breaker & Handrail Detail
34	DWIR-3STY-PMU-SHD03	Patio Verandah Handrail Detail
35	DWIR-3STY-PMU-SPIRIL & LIGHT BOX DETAIL-01	Spiral Stair Detail & Light Box Detail
36	DWIR-3STY-PMU-CF1	Ground Floor Tile Plan
37	DWIR-3STY-PMU-CF2	Ground Floor Ceiling Plan
38	DWIR-3STY-PMU-CF3	First Floor Tile Plan
39	DWIR-3STY-PMU-CF4	First Floor Ceiling Plan
40	DWIR-3STY-PMU-CF5	Second Floor Tile Plan
41	DWIR-3STY-PMU-CF6	Second Floor Ceiling Plan
42	DWIR-3STY-PMU-CF7	Roof Slab & Penthouse Floor Tile Plan
43	DWIR-3STY-PMU-CF8	Top Roof Slab Finishing Plan
44	DWIR-3STY-PMU-PS01	Performance Specification
45	DWIR-3STY-PMU-PS02	Performance Specification
46	DWIR-3STY-PMU-FD01	Floor Plan Detail
47	DWIR-3STY-PMU-FD02	Floor Plan Detail
48	DWIR-3STY-PMU-FD03	Floor Plan Detail
49	DWIR-3STY-PMU-FD04	Floor Plan Detail
50	DWIR-3STY-PMU-FD05	Floor Plan Detail
51	DWIR-3STY-PMU-FD06	Floor Plan Detail
Structural Drawings		
No	Drawing No	Drawing Title
1	DWIR-3STY-PMU-P01	General Notes (Pile & Pile Cap)
2	DWIR-3STY-PMU-P02	Pile Details
3	DWIR-3STY-PMU-GN01	General Notes
4	DWIR-3STY-PMU-GN02	General Notes
5	DWIR-3STY-PMU-GN03	General Notes
6	DWIR-3STY-PMU-GN04	General Notes
7	DWIR-3STY-PMU-SPEC01	Design Specification
8	DWIR-3STY-PMU-SPEC02	Design Specification

9	DWIR-3STY-PMU-SPEC03	Design Specification
10	DWIR-3STY-PMU-SPEC04	Design Specification
11	DWIR-3STY-PMU-SPEC05	Design Specification
12	DWIR-3STY-PMU-SPEC06	Design Specification
13	DWIR-3STY-PMU-SPEC07	Design Specification
14	DWIR-3STY-PMU-SPEC08	Design Specification
15	DWIR-3STY-PMU-SPEC09	Design Specification
16	DWIR-3STY-PMU-SPEC10	Design Specification
17	DWIR-3STY-PMU-SPEC11	Design Specification
18	DWIR-3STY-PMU-SPEC12	Design Specification
19	DWIR-3STY-PMU-SPEC13	Design Specification
20	DWIR-3STY-PMU-SPEC14	Design Specification
21	DWIR-3STY-PMU-SPEC15	Design Specification
22	DWIR-3STY-PMU-SPEC16	Design Specification
23	DWIR-3STY-PMU-SPEC17	Design Specification
24	DWIR-3STY-PMU-SPEC18	Design Specification
25	DWIR-3STY-PMU-SPEC19	Design Specification
26	DWIR-3STY-PMU-SPEC20	Design Specification
27	DWIR-3STY-PMU-SPEC21	Design Specification
28	DWIR-3STY-PMU-SPEC22	Design Specification
29	DWIR-3STY-PMU-SPEC23	Design Specification
30	DWIR-3STY-PMU-SPEC24	Design Specification
31	DWIR-3STY-PMU-SPEC25	Design Specification
32	DWIR-3STY-PMU-SPEC26	Design Specification
33	DWIR-3STY-PMU-SPEC27	Design Specification
34	DWIR-3STY-PMU-SPEC28	Design Specification
35	DWIR-3STY-PMU-SPEC29	Design Specification
36	DWIR-3STY-PMU-SPEC30	Design Specification
37	DWIR-3STY-PMU-SPEC31	Design Specification
38	DWIR-3STY-PMU-SPEC32	Design Specification
39	DWIR-3STY-PMU-SPEC33	Design Specification
40	DWIR-3STY-PMU-SPEC34	Design Specification
41	DWIR-3STY-PMU-SPEC35	Structural Steel Specification
42	DWIR-3STY-PMU-SPEC36	Structural Steel Specification

43	DWIR-3STY-PMU-SL01	Total Foundation Layout Plan
44	DWIR-3STY-PMU-S01	Pile Foundation Plan-1 @ (-2'-0")Cap Top Level
45	DWIR-3STY-PMU-S02	Pile Foundation Plan-2 @ ($\pm 0'-0''$) Level
46	DWIR-3STY-PMU-S03	Pile Cap Plans & Sections
47	DWIR-3STY-PMU-S04	Pile Cap Plans & Sections
48	DWIR-3STY-PMU-S05	Section 1-1 (Lift Pit Section)
49	DWIR-3STY-PMU-S06	Column Layout Plan (Foundation~1F Level)
50	DWIR-3STY-PMU-S07	Retaining Wall Plan
51	DWIR-3STY-PMU-S08	Ground Floor Beam Plan
52	DWIR-3STY-PMU-S09	Landing Beam & Slab Plan(GF~1F)
53	DWIR-3STY-PMU-S10	Column Layout Plan (1F~2F)
54	DWIR-3STY-PMU-S11	First Floor Beam Plan
55	DWIR-3STY-PMU-S12	First Floor Slab Plan
56	DWIR-3STY-PMU-S13	Stair Case RB, Landing Beam& Slab Plan(1F~2F)
57	DWIR-3STY-PMU-S14	Column Layout Plan(2F~P.F)
58	DWIR-3STY-PMU-S15	Second Floor Beam Plan
59	DWIR-3STY-PMU-S16	Second Floor Slab Plan
60	DWIR-3STY-PMU-S17	Landing Beam & Slab Plan(2F~P.F)
61	DWIR-3STY-PMU-S18	Column Layout Plan(PF~PR)
62	DWIR-3STY-PMU-S19	Penthouse Floor Beam Plan
63	DWIR-3STY-PMU-S20	Penthouse Floor Slab Plan
64	DWIR-3STY-PMU-S21	Penthouse Floor Parapet Beam & Slab Plan
65	DWIR-3STY-PMU-S22	Penthouse Roof Beam Plan
66	DWIR-3STY-PMU-S23	Penthouse roof Slab Plan
67	DWIR-3STY-PMU-S24	Penthouse Roof Parapet Beam & Slab Plan
68	DWIR-3STY-PMU-S25	Parapet Beam & Slab Sections
69	DWIR-3STY-PMU-S26	Main Stair Key Plan & Section A-A
70	DWIR-3STY-PMU-S27	Main Stair Section & Details
71	DWIR-3STY-PMU-S28	Emergency Stair Key Plan & Section B-B
72	DWIR-3STY-PMU-S29	Emergency Stair Section & Details
73	DWIR-3STY-PMU-S30	Passage Way Stair Key Plan & Section C-C
74	DWIR-3STY-PMU-S31	C1 Column Section @ Grid -C
75	DWIR-3STY-PMU-S32	First Floor Beam Section @ Grid-2
76	DWIR-3STY-PMU-S33	First Floor Slab Section Between Grid-2&3

77	DWIR-3STY-PMU-S34	Tie Rod Connection Detail-1 & Section
78	DWIR-3STY-PMU-S35	Tie Rod Connection Detail-2 & Section
79	DWIR-3STY-PMU-S36	Connection Detail-A&B
80	DWIR-3STY-PMU-S37	Apron & Drain Layout Plan
81	DWIR-3STY-PMU-S38	Section 10-10,11-1, Main Drain Section, Side Drain & Apron Section
82	DWIR-3STY-PMU-SH01	Schedules
83	DWIR-3STY-PMU-SH02	Schedules
84	DWIR-3STY-PMU-SH03	Schedules
85	DWIR-3STY-PMU-SH04	Schedules
86	DWIR-3STY-PMU-SH05	Schedules
87	DWIR-3STY-PMU-TOL-S01	Toilet Pile Foundation Plan
88	DWIR-3STY-PMU-TOL-S02	Toilet Retaining Wall Plan
89	DWIR-3STY-PMU-TOL-S03	Toilet Pile Cap Detail & Retaining Wall Section
90	DWIR-3STY-PMU-TOL-S04	Toilet Column Plan & Ground Floor Beam Plan
91	DWIR-3STY-PMU-TOL-S05	Toilet First & Second Floor Beam Plan
92	DWIR-3STY-PMU-TOL-S06	Toilet Roof Beam & First Floor Slab Plan
93	DWIR-3STY-PMU-TOL-S07	Toilet Second Floor & Roof Floor Slab Plan
94	DWIR-3STY-PMU-TOL-S08	Toilet Longitudinal Beam, Slab & Column Section
95	DWIR-3STY-PMU-TOL-SH01	Toilet Column, Floor Beam & Slab Schedule
96	DWIR-3STY-PMU-TOL-SL01	Car Park Layout Plan
97	DWIR-3STY-PMU-TOL-S01	Car Park Foundation, GB Plan, Schedule & RW
98	DWIR-3STY-PMU-TOL-S02	Car Park Roof Truss & Purlin Plan
99	DWIR-3STY-PMU-TOL-S03	Car Park Roof Truss Elevation
100	DWIR-3STY-PMU-TOL-S04	Car Park Frame Elevation
Electrical Drawings		
No	Drawing No	Drawing Title
1	DWIR-3STY-PMU-ELE-01	Legend
2	DWIR-3STY-PMU-ELE-02	Lighting System Layout-Ground Floor Plan
3	DWIR-3STY-PMU-ELE-03	Lighting System Layout-First Floor Plan
4	DWIR-3STY-PMU-ELE-04	Lighting System Layout-Second Floor Plan
5	DWIR-3STY-PMU-ELE-05	Lighting System Layout-Penthouse Floor Plan
6	DWIR-3STY-PMU-ELE-06	Power System Layout-Ground Floor Plan
7	DWIR-3STY-PMU-ELE-07	Power System Layout-First Floor Plan

8	DWIR-3STY-PMU-ELE-08	Power System Layout-Second Floor Plan
9	DWIR-3STY-PMU-ELE-09	Power System Layout-Penthouse Floor Plan
10	DWIR-3STY-PMU-ELE-10	Emergency & Exit Light-Ground Floor Plan
11	DWIR-3STY-PMU-ELE-11	Emergency & Exit Light-First Floor Plan
12	DWIR-3STY-PMU-ELE-12	Emergency & Exit Light-Second Floor Plan
13	DWIR-3STY-PMU-ELE-13	Emergency & Exit Light-Roof Floor Plan
14	DWIR-3STY-PMU-ELE-14	Pipe Installation for Lighting-Ground Floor Plan
15	DWIR-3STY-PMU-ELE-15	Pipe Installation for Lighting-First Floor Plan
16	DWIR-3STY-PMU-ELE-16	Pipe Installation for Lighting-Second Floor Plan
17	DWIR-3STY-PMU-ELE-17	Pipe Installation for Lighting-Penthouse Floor Plan
18	DWIR-3STY-PMU-ELE-18	Pipe Installation for Power-Ground Floor Plan
19	DWIR-3STY-PMU-ELE-19	Pipe Installation for Power-First Floor Plan
20	DWIR-3STY-PMU-ELE-20	Pipe Installation for Power-Second Floor Plan
21	DWIR-3STY-PMU-ELE-21	Pipe Installation for Power-Penthouse Floor Plan
22	DWIR-3STY-PMU-ELE-22	Lighting Protection & Earthing System
23	DWIR-3STY-PMU-ELE- SG-23	Single Line Layout Plan
24	DWIR-3STY-PMU-ELE-SG-24	Single Line Layout Plan
25	DWIR-3STY-PMU-ELE-SG-25	Single Line Layout Plan
26	DWIR-3STY-PMU-ELE-SG-26	Single Line Layout Plan
27	DWIR-3STY-PMU-ELE-SG-27	Single Line Layout Plan
28	DWIR-3STY-PMU-ELE-TL-28	Lighting & Pipe Layout Plan for GF(Toilet)
29	DWIR-3STY-PMU-ELE-TL-29	Lighting & Pipe Layout Plan for 1 st Floor(Toilet)
30	DWIR-3STY-PMU-ELE-TL-30	Lighting & Pipe Layout Plan for 2 nd Floor(Toilet)
	ELV Drawing	
1	DWIR-3STY-PMU-ELV-DET-01	Legend and Installation Details
2	DWIR-3STY-PMU-ELV-CCTV-02	CCTV Layout-Ground Floor Plan
3	DWIR-3STY-PMU-ELV-CCTV-03	CCTV Layout-Frist Floor Plan
4	DWIR-3STY-PMU-ELV-CCTV-04	CCTV Layout-Second Floor Plan
5	DWIR-3STY-PMU-ELV-CCTV-05	CCTV Layout-Penthouse Floor Plan
6	DWIR-3STY-PMU-ELV-CCTV-06	CCTV Layout-Roof Floor Plan
7	DWIR-3STY-PMU-ELV-CCTV-07	CCTV Schematic- Floor Plan
8	DWIR-3STY-PMU-ELV-PA-01	Public Address (PA) Layout - Ground Floor Plan
9	DWIR-3STY-PMU-ELV-PA-02	Public Address (PA) Layout - First Floor Plan

10	DWIR-3STY-PMU-ELV-PA-03	Public Address (PA) Layout - Second Floor Plan
11	DWIR-3STY-PMU-ELV-PA-04	Public Address (PA) Layout - Penthouse Floor Plan
12	DWIR-3STY-PMU-ELV-PA-05	Public Address (PA) Layout - Roof Floor Plan
13	DWIR-3STY-PMU-ELV-PA-06	Public Address (PA) Layout - Schematic Diagram
14	DWIR-3STY-PMU-ELV-DATA-01	Telephone and Data Layout- Ground Floor Plan
15	DWIR-3STY-PMU-ELV-DATA-02	Telephone and Data Layout- First Floor Plan
16	DWIR-3STY-PMU-ELV-DATA-03	Telephone and Data Layout- Second Floor Plan
17	DWIR-3STY-PMU-ELV-DATA-04	Telephone and Data Layout- Penthouse Floor Plan
18	DWIR-3STY-PMU-ELV-DATA-05	Telephone and Data Layout- Roof Floor Plan
19	DWIR-3STY-PMU-ELV-DATA-06	Data and Network Schematic Diagram
20	DWIR-3STY-PMU-ELV-PABX-07	Pabx Schematic Diagram
21	DWIR-3STY-PMU-ELV-FA-01	Fire Alarm Layout- Ground Floor Plan
22	DWIR-3STY-PMU-ELV-FA-02	Fire Alarm Layout- First Floor Plan
23	DWIR-3STY-PMU-ELV-FA-03	Fire Alarm Layout- Second Floor Plan
24	DWIR-3STY-PMU-ELV-FA-04	Fire Alarm Layout- Penthouse Floor Plan
25	DWIR-3STY-PMU-ELV-FA-05	Fire Alarm Layout- Roof Floor Plan
26	DWIR-3STY-PMU-ELV-FA-06	Fire Alarm Schematic Diagram
Mechanical Drawings		
No	Drawing No	Drawing Title
1	DWIR-3STY-PMU-W.S-01	Drawing List
2	DWIR-3STY-PMU-W.S-02	Building Layout Plan
3	DWIR-3STY-PMU-W.S-03	Soil, Waste, Vent & Rain Water Downtake Pipe System at Ground Floor
4	DWIR-3STY-PMU-W.S-04	Soil, Waste, Vent & Rain Water Downtake Pipe System at First Floor
5	DWIR-3STY-PMU-W.S-05	Soil, Waste, Vent & Rain Water Downtake Pipe System at Second Floor
6	DWIR-3STY-PMU-W.S-06	Soil, Waste, Vent & Rain Water Downtake Pipe System at Penthouse Floor
7	DWIR-3STY-PMU-W.S-07	Soil, Waste, Vent & Rain Water Downtake Pipe System at Top Roof Slab
8	DWIR-3STY-PMU-W.S-08	Soil, Waste, Vent & Rain Water Downtake Pipe System Detail at Toilet (Ground to Second Floor)
9	DWIR-3STY-PMU-W.S-09	Soil, Waste, Vent Pipe System Details at PMU Building
10	DWIR-3STY-PMU-W.S-10	Internal Water Supply System & Fire Protection System at Ground Floor
11	DWIR-3STY-PMU-W.S-11	Internal Water Supply System & Fire Protection System at First Floor

12	DWIR-3STY-PMU-W.S-12	Internal Water Supply System & Fire Protection System at Second Floor
13	DWIR-3STY-PMU-W.S-13	Internal Water Supply System & Fire Protection System at Penthouse Floor
14	DWIR-3STY-PMU-W.S-14	Internal Water Supply System & Fire Protection System at Top Roof Slab
15	DWIR-3STY-PMU-W.S-15	Internal Water Supply System Details at Toilet (Ground to Second Floor)
16	DWIR-3STY-PMU-W.S-16	Internal Water Supply System Toilet Roof Slab Plan
17	DWIR-3STY-PMU-W.S-17	Internal Water Supply System Details at Ground Floor
18	DWIR-3STY-PMU-W.S-18	Internal Water Supply System Details at 1st & 2nd Floor
19	DWIR-3STY-PMU-W.S-19	Internal Water Supply System Details at Penthouse Floor
20	DWIR-3STY-PMU-W.S-20	Internal Water Supply Pipe, Fire Protection & Sanitation Schematic Diagram
21	DWIR-3STY-PMU-W.S-21	Septic Tank with Upflow Anaerobic Filter System for (140) Persons Sanitary Installation
22	DWIR-3STY-PMU-W.S-22	Ground Tank Foundation & Structure Plan
23	DWIR-3STY-PMU-W.S-23	Ground Tank Rafter & Purlin Plan
24	DWIR-3STY-PMU-W.S-24	Ground Tank Section

SECTION 5 FORM OF BID

_____ (Date)

To: _____ (Employer's Name)

_____ (Employer's Address)

We offer to execute the _____ (name and number of Contract) in accordance with the Draft Civil Works Contract accompanying this Bid for the Contract Price of _____ (amount in words and numbers) (_____) (name of currency) _____. We agree to complete the works according to the Drawings and the Specification and within the time allowed.

This Bid and your written acceptance will constitute a binding Contract between us. We understand that you are not bound to accept the lowest or any Bid you receive.

We hereby confirm that this Bid will remain **valid for 90 days after** then Deadline for Submission of Bids.

We note and accept without reservation the Government's and the World Bank's (when other than the Government) right to audit and inspect any and all records relating both to the preparation of our Bid, and if our Bid is successful, the execution of the resulting contract.

Authorized Signature: _____
Name and Title of Signatory _____

Name of Contractor: _____
Address: _____

Phone Number _____
Fax Number, if any _____

SECTION 6. ACTIVITY SCHEDULE

THIS FORM MUST BE FILLED-IN BY THE BIDDER AND SUBMITTED WITH THE BID. THE ACTIVITY SCHEDULE SUBMITTED BY THE BIDDER SHALL CONSTITUTE THE BASIS FOR THE BID PRICE AND THE SUBSEQUENT CONTRACT PRICE.

PREAMBLE TO THE ACTIVITY SCHEDULE

1. This Activity Schedule shall be read together with the whole Bidding Documents. It shall be deemed to be considered that the Bidder has examined all the Bidding Documents; Conditions of Contract (CC), Technical Specifications, Drawings, and also the Site conditions, that he is aware of the detailed explanations of the works to be executed and that he has received information in detail how the works are to be executed.
2. Lump-sum value shall be entered for each item of Activity Schedule.
3. The lump-sum value submitted by the Contractor for each activity in the Activity Schedule shall be deemed to cover costs of Materials, transport, workmanship, mobilization, demobilization, temporary works and facilities, scaffolding, formwork, tests, all loss and profit, as well as the overheads and customary general expenses for completion of the works for the Activity according to the Drawings and Technical Specifications.
4. Upon completion of the Works, the Contractor will be responsible for obtaining the following permissions from the relevant Authorities for occupation of the Building:
 - Inspection Certificate from Fire Services Department
 - Electrical Inspection for Passenger Elevator from Directorate of Industrial Supervision and Inspection under Ministry of Industry
 - Building completion certificate from YCDC

The Contractor will pay the fees required by these Authorities for inspection and issue of the certificate. The fees paid by the Contractor to those Authorities will be reimbursed by the Employer upon submission of the relevant invoices within 14 days.

5. During the execution of the Works on the Site (s), the Contractor shall record all information necessary for preparing as-built drawings. Neatly marked-up drawings and other documents covering the Works as completed shall be available to the Project Manager at any time during construction.

The Contractor shall submit instructions and manuals for mechanical and electrical works to the Project in order to facilitate operation and

maintenance, together with the "As-built Drawings".

No payment shall be made for as-built drawings and operation and maintenance manuals since it is deemed to be included in the overheads of the Contractor.

6. Materials, workmanship and all works inside and outside shall conform to the standards stipulated in the Technical Specifications or other equivalent standards as determined by the Project Manager. The latest revision or edition of the Standards in respect of the tender date shall be used.

National Standard Bidding Documents, Procurement of Works

Province:		District:		Commune:			Name of Project:	
Name of Contractor:			Telephone:		Name of Works Manager:		Telephone:	
Contract Start Date:					Contract Completion Date:			
Activity No	Description of Works Activities	Lump-sum Amount (USD)	Start Date	Finish Date	Key Stage for Technical Monitoring	Name of Subcontractor, if any.	Contract Implementation	
							Problems	Solutions
1.	Piling works							
1.1	Piling work (including mobilization, demobilization)							
Sub-Total (1)								
2.	Structure Works							
2.1	Earthwork Excavation							
2.2	Trimming tops of Pile							
2.3	Pile Cap work							
2.4	Retaining wall work							
2.5	Ground Beam work							
2.6	Ground to first floor level column & stair							
2.7	First floor level beam and slab work							
2.8	First to second floor level column and stair							
2.9	Second floor level beam and slab work							
2.10	Second to roof floor level column and stair							
2.11	Roof floor level beam and slab work							
2.12	Roof to pent house floor level column and stair							
2.13	Pent house floor level beam and slab work							
2.14	Ground floor level concreting work							
Sub-Total (2)								
3.	Brick work , Plastering and Leveling concrete works							
3.1	Ground floor level brick work & internal plastering							

National Standard Bidding Documents, Procurement of Works

3.2	First floor level brick work & internal plastering							
3.3	Second floor level brick work & internal plastering							
3.4	Pent floor level brick work & internal plastering							
3.5	Plastering work for External wall							
3.6	Ground floor level levelling concrete work							
3.7	First floor level levelling concrete work							
3.8	Second floor level levelling concrete work							
3.9	Pent floor level levelling concrete work							
Sub-Total (3)								
4.	Finishing works							
4.1	Tiling work							
4.2	Installation work for door & window							
4.3	Ceiling work							
4.4	Shera board light partition							
4.5	Installation work Handrail and Spiral stair							
4.6	Installation work for sun breaker							
4.7	Aluminum light partition							
4.8	Installation work for glass curtain wall							
4.9	Transparent roof sheet work							
4.10	Parquet work for stage							
4.11	Painting work for internal wall							
4.12	Painting work for external wall							
4.13	Counter Slab							
Sub-Total (4)								
5.	Water Supply and Sanitation System							
5.1	Internal Piping Work for Water Supply System							
5.2	Internal Piping Work for Sanitation System							
5.3	Transfer Pump Connection and Pumping Main							

National Standard Bidding Documents, Procurement of Works

	Line							
5.4	Overhead Tank Connection							
5.5	Sanitary Ware Installation							
Sub-Total (5)								
6.	Fire Fighting System							
6.1	Piping Work							
6.2	Hose Reel Cabinet Installation (Including Hose Reel Drum, 25 Ø Hose Pipe, 25 Ø Stop Valve and Nozzle)							
6.3	Hose Reel Pump and Pump Connection							
Sub-Total (6)								
7.	Electrical Works							
7.1	Piping Installation work							
7.2	Wiring Installation work							
7.3	DB, Switch Socket & Light fitting Installation Work							
7.4	Air conditioning System Installation Work							
7.5	Earthing & Bonding system Installation work							
7.6	Passenger Elevator Supply & Installation Work							
Sub-Total (7)								
8.	Extra Low voltage System							
8.1	Closed Circuit Television System Installation Work							
8.2	Public Address System Installation Work							
8.3	Telephone and Data System Installation Work							
8.4	Fire Alarm System Installation Work							
Sub-Total (8)								
9.	Infrastructure Works							
9.1	Septic Tank							
9.2	Ground Tank							
9.3	Car Parking							
9.4	Side Drain & Apron							

National Standard Bidding Documents, Procurement of Works

9.5	Concrete Paving							
9.6	Internal Road Side Drain							
9.7	Landscaping work							
Sub-Total (8)								
Grand Total (Sub-Total(1)+ Sub-Total(2) + Sub-Total(3)+ Sub-Total(4)+ Sub-Total(5)+ Subtotal(6)+ Sub-Total(7)+ Sub-Total(8)+ Sub-Total(9))								

SECTION 7 FORM OF CONTRACT AGREEMENT

AGREEMENT

This Agreement, made the _____ day of _____ 2017, by and between

(name and address of Employer hereinafter called “the Employer”) and

(name and address of Contractor hereinafter called “the Contractor”) of the other part.

Whereas the Employer is desirous that the Contractor execute _____

(name and identification number of Contract hereinafter called “the Works”)

and the Employer has accepted the Bid submitted by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

Now this Agreement witnessed 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 hereafter referred to, and they shall be deemed to form and be read and construed as part of this Agreement.
2. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.
3. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects wherein the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

Sample Invitation to Bid, Procurement of Works

In Witness whereof the parties thereto have caused this Agreement to be executed the days and year first before written

The Common Seal of

was hereunto affixed in the presence of:

Signed, Sealed, and Delivered by the
said

in the presence of :

Binding Signature of Employer: _____

Binding Signature of Contractor: _____

SECTION 8 - BID AND PERFORMANCE SECURING DECLARATION

The **Bidder** shall fill in this form in accordance with the instructions indicated in brackets, and submit with the Bid.

Date: *[insert date]*

Name of contract: *[insert name]*

Contract Identification N^o: *[insert number]*

Invitation for Bid No.: *[insert number]*

To: _____

We, the undersigned, declare that:

1. We understand that, according to your conditions, bids must be supported by a bid and performance securing declaration.
2. We accept that we shall be suspended from being eligible for bidding in any contract with the Employer and the Government of Myanmar for a period of time of two (2) years starting on the date of the Employer's execution of this Declaration, or pay 2% of the contract price as a penalty, if we are in breach of our obligation(s) under the bid conditions and contract conditions, because we:
 - a) have withdrawn our Bid during the period of bid validity specified by us in the Bid Submission Sheet; or
 - b) do not accept the correction of errors in accordance with the Instructions to Bidders of the Bidding Documents, or
 - c) having been notified of the acceptance of our Bid by the Employer during the period of bid validity, (i) fail or refuse to execute the Contract Form, if required, or
 - d) committed a fundamental breach of contract leading to the Employer's termination of the contract for reasons of our default.
3. We understand this bid securing shall expire if we are not the successful bidder, upon the earlier of (i) our receipt of a copy of your notification that we were unsuccessful; or (ii) thirty days after the expiration of our bid, or in the event that our bid is successful and we are awarded a contract we understand that this bid and performance securing declaration will expire upon successful completion of the Guarantee period specified in paragraph 18. of the Conditions of Contract.
4. We understand that if we are a JV, the Bid and Performance Securing Declaration must be in the name of the JV that submits the bid. If the JV has not been legally constituted at the time of bidding, the Bid Securing Declaration shall be in the names of all future partners as named in the letter of intent.

Signed *[insert signature(s) of authorized representative]* In the Capacity of *[insert title]*

Sample Invitation to Bid, Procurement of Works

Name *[insert printed or typed name]*

Duly authorized to sign the bid for and on behalf of *[insert authorizing entity]*

Dated on *[insert day]* day of *[insert month]*, *[insert year]*