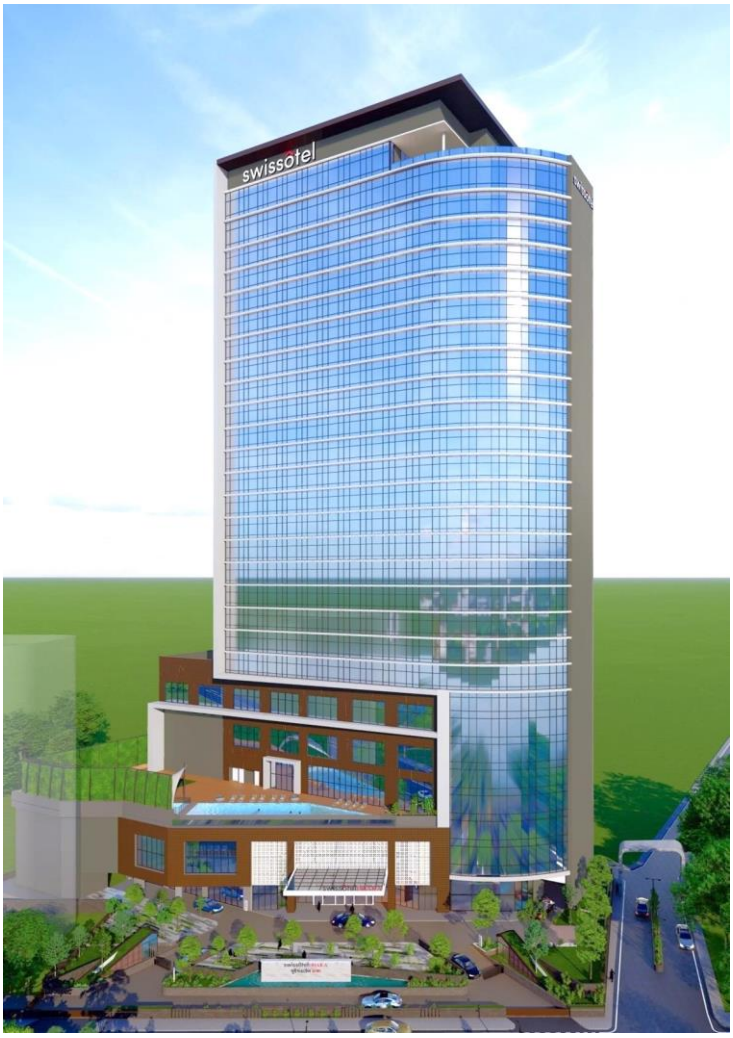
BENGAL HOTELS AND RESORTS PROJECT

208, Tejgaon-Gulshan Link Road, Dhaka-1208, Bangladesh



Tender Document for
Design, Supply, Fabricating, Fitting and Fixing of Semi-Unitized Façade System

Date: August 01, 2024

Client:
Bengal Hotels & Resorts Limited
75, Gulshan Avenue, Dhaka

Principle Design Consultant:
Dynamic Engineering Consultants
Co., Ltd (DEC), Bangkok, Thailand

Local Architect:
4walls inside outside
H264, R19, Mohakhali DOHS

Deltadesh Pvt. Ltd. Dhaka

Content

SECTION-01: INVITATION FOR TENDER (IFT)

BENGAL HOTELS AND RESORTS LTD. (BHRL)

Sealed Tenders are hereby invited from the Prequalified Tenderers as defined in the tender documents for the under mentioned work as per terms and condition stated below:

01	Procuring Entity/Employer's Name with address	Bengal Hotels and Resorts Ltd (BHRL). Address: Bengal House, 75 Gulshan Avenue, Dhaka- 1212.	
02	Name of the Project	Bengal Hotels and Resorts Project (Swissotel, Dhaka) at 208 Tejgaon- Gulshan, Link Road, Dhaka, Bangladesh.	
03	Name of the Work	Design, Supply, Fabricating, Fitting and Fixing of Semi-Unitized Façade System	
04	Tender Package number		
05	Invitation for Tenders Date	01-08-2024	
KEY INFORMATION			
06	Procurement Method	Open Tendering Method (OTM)	
FUNDING INFORMATION			
07	Budget and Source of Funds	BHRL's Own Fund	
PARTICULAR INFORMATION			
08	Tender Publication Date	01-08-2024 www.bengalgroup.com/hotels	
09	Tender Last Selling Date	Up to 10-08-2024 during office hour	
10	Tender Closing Date and Time	01-09-2024	Time: 3:00 p.m
11	Tender Opening Date and Time	01-09-2024	Time: 3:30 p.m
12	Name & Address of the officer	**Name**	**Address:**
a	Selling/Issuing the Tender Document	Engr. Md. Imrul Kalam Project Manager, PMC, Project Management Consultant (PMC), Telephone: +8801966614018	Deltadesh (Pvt.) Ltd. Oriental Hasnahena, Apt. # B5, Plot # 49 & 51, Road # 6, Block- C, Niketon, Gulshan 1, Dhaka- 1212 Email: civil1.bhrl@bengal.com.bd
b	Receiving the Tenders	Engr. Md. Imrul Kalam Project Manager, PMC, Project Management Consultant (PMC), Telephone: +8801966614018	Deltadesh (Pvt.) Ltd. Oriental Hasnahena, Apt. # B5, Plot # 49 & 51, Road # 6, Block- C, Niketon, Gulshan 1, Dhaka- 1212 Email: civil1.bhrl@bengal.com.bd
c	Opening Tenders	Engr. Md. Imrul Kalam Project Manager, PMC, Project Management Consultant (PMC), Telephone: +8801966614018	Deltadesh (Pvt.) Ltd. Oriental Hasnahena, Apt. # B5, Plot # 49 & 51, Road # 6, Block- C, Niketon, Gulshan 1, Dhaka- 1212 Email: civil1.bhrl@bengal.com.bd
INORMATION FOR TENDERER			
13	Eligibility of Tenderer	Any Glass & Façade Vendor	
14	Brief Description of Works	Exterior Glass & Facade Works from Basement to Level 26	

15	Time of completion of the work	12 (Twelve) Calendar months from the date of issue of work order
Special Instruction		
16	a) Bengal Hotels and Resorts Ltd. (BHRL) and PMC reserves the right to accept any tender or reject any or all tenders at any time prior to contract award, without thereby incurring any liability to the affected Tenderers, or any obligation to inform Tenderers of the grounds for BHRL's action. b) Tenderer should fill all necessary Forms of the Tender Document. For any clarification regarding preparation and submission of Tender the Tenderers may contact the PMC Office, Deltadesh (Pvt.) Ltd., Apt. # B5, Plot # 49 & 51, Road # 6, Block- C, Niketon, Gulshan 1, Dhaka- 1212. E-mail: info@deltadesh.com.	

Engr. Md. Atiqul Islam
Head of PMC,

Deltadesh (Pvt.) Ltd.
Oriental Hasnahena, Apt. # B5, Plot # 49 & 51,
Road # 6, Block- C, Niketon, Gulshan 1, Dhaka- 1212.
E-mail: info@deltadesh.com
Telephone: +8801944 222888

SECTION-02: ABSTRACT OF BID

1.	Name of the Project	:	**Bengal Hotel & Resorts Limited**
2.	Name of the work	:	Design, Supply, Fabricating, Fitting and Fixing of Semi-Unitized Façade System
3.	Performance Security / Guarantee	:	10% of the Contract amount for imported item (A) is to be deposited in the form of a Bank Guarantee in a specified format from a scheduled Bank. It will be released after successful completion of the work.
			10% of the Contract amount for local item (B) & Installation work (C) is to be deducted from each certified bill. It will be released after successful completion of one year of the warranty period
4.	Work Completion Time	:	12 months from the date of the Work Order.
5.	Warranty/Defect Liability Period	:	18 months from the date of Delivery or 12 months from the date of commissioning whichever is later.
6.	Validity of Bid	:	90 (ninety) days from the opening of the Bid.
7.	Validity of Contract	:	3 (three) years from the date of the Work Order.
8.	Custom duty, VAT, Taxes, etc. on imported item	:	To be paid by the client
9.	Liquidated damage		0.1% of the Contract amount for delay of every calendar day. It shall not exceed 10% of the Contract amount
10.	Bidders' qualification	:	As per the Bid Notice. In addition, a. Require similar work experience in at least 3 (three) Hotel Projects or, at least 3 (Three) 20-storied commercial building within the last 7 (seven) years with the same brand of major equipment. Required to submit a copy of the work completion certificate from the competent authority. b. Must be an authorized distributor of the Major equipment. Required to submit a copy of the Authorization certificate.
11.	Supervision	:	The contractor's representative at the site must be a Graduate Architect or Graduate Engineer with at least 5 (five) years of experience in a relevant field as well as in a hotel project.
			Need to submit proposed organogram with CVs for this Project Team to work at the site for full time.
12.	Enhancement of rate	:	No enhancement of rate shall be entertained in the event of price escalation or any other reasons.
13.	Evaluation of Bid	:	The marks distributed for the technical offer is 40 and for the financial offer is 60 marks. The Bids shall be sorted based on total marks obtained. However, the client reserves right to carry out post Bid negotiation with bidders for any technical and financial issues. The client reserves the right to accept any Bid or cancel all the Bids without assigning any reason.
14.	Currency of Bid and Payment	:	As per BOQ Schedule based on unit rate.
15.	Mode of payment	:	a) For imported items: by irrevocable L/C at sight by Client b) For local works: As per work progress

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16.	Minimum amount for Running Bill	:	20% of the Contract amount of corresponding currency.
17.	Minimum amount of 3rd party insurance	:	Tk. 50,000 (fifty thousand) per incidence. A number of incidences is unlimited.
18.	Consistency of quoted rate	:	The rate must be the same for the same item repeating under different titles of works. In case of such evidence, the lowest rate to be considered.
19.	Language of Bid	:	All catalogues, manuals, etc. shall be in English.
20.	Equipment Plinth & Punch in RCC	:	The Contractor will supply Equipment Plinth drawings, and minimum Punch requirement drawings in RCC Wall floor or roof. The Client will carry out those works getting detailed structural drawings from the Structural designer.
21.	Special instruction	:	a) The Contractor is to verify the size and quantity of individual items before placement of the order.
		:	b) The work is based on actual measurement of work done. For any imported item, the Contractor is to verify the quantity before ordering.
		:	c) The bidders are encouraged to visit site (if possible) before bid submission to avoid any discrepancy
22.	Shop Drawing Facility		The Contractor must have to engage an experienced team for the preparation of Shop drawings and As-built drawings at the site coordinating with interior and other services.
23.	Recommended list of manufactures	:	A recommended list of manufacturers is enclosed. However, any internationally certified product with specified specification is acceptable.

Note: Any issue mentioned in Bid documents contradicts that of “Abstract of Bid”, the same mentioned in “Abstract of Bid” shall be governed.

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SECTION-3: INSTRUCTIONS TO TENDERERS

A. General

1. Scope of Tender

1.1 The Procuring Entity, as indicated in the Tender Data Sheet (**TDS)** issues this Tender Document for the procurement of Works and physical services incidental thereto as specified in the **TDS** and as detailed in **Bill of Quantities**. The name of the Tender and the number and identification of its constituent lot(s) are stated in the **TDS.**

1.2 The successful Tenderer shall be required to execute the Works and physical services as specified in the General Conditions of Contract

2. Interpretation

2.1 Throughout this Tender Document:

(a) the term "in writing" means communication written by hand or machine duly signed and includes properly authenticated messages by facsimile or electronic mail;

(b) if the context so requires, singular means plural and vice versa;

(c) "day" means calendar days unless otherwise specified as working days;

(d) "Person" means and includes an individual, body of individuals, sole proprietorship, partnership, company, association or cooperative society that wishes to participate in Procurement proceedings;

(e) "Tenderer" meansa prequalified construction firm who submits a Tender;

(f) "Tender Document" means the Document provided by a Procuring Entity to a Tenderer as a basis for preparation of the Tender; and

(g) "Tender" depending on the context, means a Tender submitted by a Tenderer for execution of Works and physical services to a Procuring Entity in response to an Invitation for Tender.

3. Source of Funds

3.1 The Procuring Entity has been allocated public funds as indicated in the **TDS** and intends to apply a portion of the funds to eligible payments under the Contract for which this Tender Document is issued.

3.2 For the purpose of this provision, "public funds" means any monetary resources appropriated to the Procuring Entity under OWN Budget, or loan, grants and credits placed at the disposal of the Procuring Entity through the development partners or foreign states or organisations.

3.3 Payments by the development partner, if so indicated in the **TDS**, will be made only at the request of the Procuring Entity and upon approval by the development partner or foreign state or Organisation in accordance with the applicable Loan / Credit / Grant Agreement, and will be subject in all respects to the terms and conditions of that Agreement.

4. Corrupt, Fraudulent, Collusive, Coercive (or Obstructive in case of Development Partner) Practices

4.1 The Procuring Entity (including beneficiaries of loans) as well as the Tenderers and Contracts (including sub-contractors, agents, personnel, consultants, and service providers) shall observe the highest standard of ethics during implementation of procurement proceedings and the execution of Contracts under public funds.

4.2 For the purposes of ITT Sub Clause 4.3, the terms set forth below as follows:

(a) "corrupt practice" means offering, giving or promising to give, receiving, or soliciting either directly or indirectly, to any officer or employee of the Procuring Entity or other public or private authority or individual, a gratuity in any form; employment or any other thing or service of value as an inducement with respect to an act or decision or method followed by the Procuring Entity in connection with a Procurement proceeding or Contract execution;

(b) "fraudulent practice" means the misrepresentation or omission of facts in order to influence a decision to be taken in a Procurement proceeding or Contract execution;

(c) "collusive practice" means a scheme or arrangement between two (2) or more Persons, with or without the knowledge of the Procuring Entity, that is designed to arbitrarily reduce the number of Tenders submitted or fix Tender prices at artificial, non-competitive levels, thereby denying the Procuring Entity the benefits of competitive price arising from genuine and open competition;

(d) "coercive practice" means harming or threatening to harm, directly or indirectly, Persons or their property to influence a decision to be taken in the Procurement proceeding or the execution of a Contract, and this will include creating obstructions in the normal submission process used for Tenders.

(e) "Obstructive practice" (applicable in case of Development Partner) means deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede an investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and /or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation.

4.3 Should any corrupt, fraudulent, collusive, coercive (or obstructive in case of Development Partner) practice of any kind is determined by the Procuring Entity or the Development Partner, if applicable, this will be dealt in accordance with the provisions of the Public Procurement Act and Rules and Guidelines of the Development Partners as stated in the ITT

sub-clause 3.3.In case of obstructive practice, this will be dealt in accordance with Development Partners Guidelines.

4.4 If corrupt, fraudulent, collusive, coercive (or obstructive in case of Development Partner) practices of any kind is determined by the Procuring Entity against any Tenderer or Contracts (including sub-contractors, agents, personnel, consultants, and service providers) in competing for, or in executing, a contract under public fund:

(a) Procuring Entity and/or the Development Partner shall exclude the concerned Tenderer from further participation in the concerned procurement proceedings;

(b) Procuring Entity and/or the Development Partner shall reject any recommendation for award that had been proposed for that concerned Tenderer;

(c) Procuring Entity and/or the Development Partner shall declare, at its discretion, the concerned Tenderer to be ineligible to participate in further Procurement proceedings, either indefinitely or for a specific period of time;

(d) Development Partner shall sanction the concerned Tenderer or individual, at any time, in accordance with prevailing Development Partner' sanctions procedures, including by publicly declaring such Tenderer or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded a Development Partner-financed contract; and (ii) to be a nominated sub-contractor, consultant, manufacturer or Contractor, or service provider of an otherwise eligible firm being awarded a Development Partner-financed contract; and

(e) Development Partner shall cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Procuring Entity or of a beneficiary of the loan engaged in corrupt, fraudulent, collusive, coercive or obstructive practices during the procurement or the execution of that Development Partner financed contract, without the Procuring Entity having taken timely and appropriate action satisfactory to the Development Partner to remedy the situation.

4.5 Tenderer shall be aware of the provisions on corruption, fraudulence, collusion, coercion (and obstruction, in case of Development Partner) of the Public Procurement Act, 2006, the Public Procurement Rules, 2008 and others as stated in GCC Clause 38.

4.6 In further pursuance of this policy, Tenderers, Contractors and their sub-contractors, agents, personnel, consultants, service providers shall permit the Procuring Entity and the Development Partner to inspect any accounts and records and other documents relating to the Tender submission and contract performance, and to have them audited by auditors appointed by the Procuring Entity and/or the Development Partner during

the procurement or the execution of that Development Partner financed contract.

5. Eligible Tenderers

5.1 This Invitation for Tenders is open to all, except for any specified in the **TDS**.

5.2 Tenderers shall have the legal capacity to enter into the Contract under the Applicable law.

5.3 Tenderers shall be enrolled in the relevant professional or trade organisations registered in Bangladesh.

5.4 Tenderers may be a physical or juridical individual or body of individuals, or company, association or any combination of them in the form of a Joint Venture(JV) invited to take part in public procurement or seeking to be so invited or submitting a Tender in response to an Invitation for Tenders.

5.5 Tenderers shall have fulfilled its obligations to pay taxes and social security contributions under the provisions of laws and regulations of the country of its origin.

5.6 Tenderers should not be associated, or have been associated in the past, directly or indirectly, with a consultant or any of its affiliates which have been engaged by the Procuring Entity to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the works to be performed under this Invitation for Tenders.

5.7 Tenderers in its own name or its other names or also in the case of its Persons in different names shall not be under a declaration of ineligibility for corrupt, fraudulent, collusive or coercive practices as stated under ITT Sub Clause 4.4 (or obstructive practice, in case of Development Partner) in relation to the Development Partner's Guidelines in projects financed by Development Partner.

5.8 Tenderers are not restrained or barred from participating in Public Procurement on grounds of poor performance in the past under any Contract.

5.9 Tenderers shall not be insolvent, be in receivership, be bankrupt, be in the process of bankruptcy, be not temporarily barred from undertaking business and it shall not be the subject of legal proceedings for any of the foregoing.

5.10 Procuring Entity -owned enterprise in Bangladesh may also participate in the Tender if it is legally and financially autonomous, it operates under commercial law, and it is not a dependent agency of the Procuring Entity.

5.11 Tenderers shall provide such evidence of their continued eligibility satisfactory to the Procuring Entity, as the Procuring Entity will reasonably request.

5.12 These above requirements for eligibility will extend, as applicable, to each JV partner and Subcontractor proposed by the Tenderers.

5.13 Tenderers shall have the up-to-date valid license(s), issued by the corresponding competent authority, as specified in the **TDS.**

6. Eligible Materials, Equipment and Associated Services

6.1 All materials, equipment and associated services to be supplied under the Contract are from eligible sources, unless their origin is from a country specified in the **TDS.**

6.2 For the purposes of this Clause, "origin" means the place where the Materials and Equipment's are mined, grown, cultivated, produced or manufactured or processed, or through manufacturing, processing, or assembling, another commercially recognized new product results that differs substantially in its basic characteristics from its components or the place from which the associated services are supplied.

6.3 The origin of materials and equipment and associated services is distinct from the nationality of the Tenderer.

7. Site Visit

7.1 Tenderers are advised to visit and examine the Site of Works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the Tender and entering into a contract for construction of the Works. The costs of visiting the Site shall be at Tenderer's own expense.

B. Tender Document

8. Tender Document: General

8.1 The Sections comprising the Tender Document are listed below, and should be read in conjunction with any Addendum issued under ITT Clause 11.

- Section 1 Information to Tenderers (**IFT**)
- Section 2 Abstract Of Tender
- Section 3 Instruction to Tenderers (**ITT**)
- Section 4 Tender Data Sheet (**TDS**)
- Section 5 Scop of Works
- Section 6 General Conditions of Contract (**GCC**)
- Section 7 Particular Conditions of Contract (**PCC**)
- Section 8 Tender and Contract Forms
- Section 9 List of Manufacture
- Section10 List of Deviation
- Section 11 Drawings
- Section 12 Bill of Quantities (**BOQ**)
- Section 13 Health, Safety and Environment Plan

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8.2 The Procuring Entity is not responsible for the completeness of the Tender Document and their addenda, if these were not purchased directly from the Procuring Entity, or through its agent as specified in the **TDS.**

8.3 Tenderers are expected to examine all instructions, forms, terms, and specifications in the Tender Document as well as in addendum to Tender, if any.

9. Clarification of Tender Document

9.1 A prospective Tenderer requiring any clarification of the Tender Document shall contact the Procuring Entity in writing at the Procuring Entity's address and within time as specified in the **TDS.**

9.2 The Procuring Entity is not obliged to answer any clarification request received after that date as stated under ITT Sub Clause 9.1.

9.3 The Procuring Entity shall respond in writing within five (5) working days of receipt of any such request for clarification received under ITT Sub Clause 9.1.

9.4 The Procuring Entity shall forward copies of its response to all those who have purchased the Tender Document, including a description of the enquiry but without identifying its source.

9.5 Should the Procuring Entity deem it necessary to revise the Tender Document as a result of a clarification, it will do so following the procedure under ITT Clause 11.

10. Pre-Tender Meeting

10.1 To clarify issues and to answer questions on any matter arising in the Tender Document, the Procuring Entity may, if stated in the **TDS**, hold a pre-Tender Meeting at the place, date and time as specified in the **TDS**. All potential Tenderers are encouraged and invited to attend the meeting, if it is held.

10.2 Tenderers are requested to submit any questions in writing so as to reach the Procuring Entity not later than one day prior to the date of the meeting.

10.3 Minutes of the pre-Tender meeting, including the text of the questions raised and the responses given, together with any responses prepared after the meeting, will be transmitted within five (5) working days after holding the meeting to all those who purchased the Tender document and to even those who did not attend the meeting. Any revision to the Tender Document listed in ITT Sub Clause 8.1 that may become necessary as a result of the pre-Tender meeting will be made by the Procuring Entity exclusively through the issue of an Addendum pursuant to ITT Sub Clause 11 and not through the minutes of the pre-Tender meeting.

10.4 Non-attendance at the Pre-Tender meeting will not be a cause for disqualification of a Tenderer.

11. Addendum to Tender Document

11.1 At any time prior to the deadline for submission of Tenders, the Procuring Entity, on its own initiative or in response to an inquiry in writing from a Tenderer, having purchased the Tender Document, or as a result of a pre-Tender meeting may revise the Tender Document by issuing an Addendum.

11.2 The Addendum issued under ITT Sub Clause 11.1 shall become an integral part of the Tender Document and shall have a date and an issue number and must be circulated by fax, mail or e-mail, to Tenderers who have purchased the Tender Documents, within five (5) working days of issuance of such Addendum, to enable Tenderers to take appropriate action

11.3 The Procuring Entity shall also ensure posting of the relevant addenda with the reference number and date on their websites including notice boards, where the Procuring Entity had originally posted the IFTs.

11.4 To give a prospective Tenderer reasonable time in which to take an addendum into account in preparing its Tender, the Procuring Entity may, at its discretion, extend the deadline for the submission of Tenders, pursuant to ITT Sub Clause 42.2.

11.5 If an addendum is issued when time remaining is less than **one-third** of the time allowed for the preparation of Tenders, the Procuring Entity at its discretion shall extend the deadline by an appropriate number of days for the submission of Tenders, depending upon the nature of the Procurement requirement and the addendum. In any case, the minimum time for such extension shall not be less than three (3) working days.

C. Qualification Criteria

12. General Criteria

12.1 Tenderers shall possess the necessary professional and technical qualifications and competence, financial resources, equipment and other physical facilities, managerial capability, specific experience, reputation, and the personnel, to perform the contract, which entails setting pass/fail criteria, which if not met by the Tenderers, will result in consideration of its Tender as non-responsive.

12.2 In addition to meeting the eligibility criteria, as stated in ITT Clause 5, Tenderers must satisfy the other criteria stated in ITT Clauses 13 to 18 inclusive

12.3 To qualify for multiple number of contracts/lots in a package made up of this and other individual contracts/lots for which Tenders are invited in the Invitation for Tenders, the Tenderers shall demonstrate having resources sufficient to meet the aggregate of the qualifying criteria for the individual contracts. The requirement of general experience as stated under ITT Sub Clause 14.1(a) and specific experience, unless otherwise of different nature, as stated under ITT Sub Clause 15.1(b) shall not be separately applicable for each individual lot.

13. Litigation History

13.1 Litigation history shall comply with the requirement as stated under ITT Sub Clause15.1(c).

14. Experience Criteria

14.1 Tenderers shall have the following minimum level of construction experience to qualify for the performance of the Works under the Contract:

(a) a minimum number of years of general experience in the construction of works as Prime Contractor or Subcontractor or Management Contractor as specified in the **TDS**; and

(b) Specific experience as a Prime Contractor or Subcontractor or Management Contractor in construction works of a nature, complexity and methods/construction technology similar to the proposed Works, in at least a number of contract(s)and, each with a minimum value over the period, as specified in the **TDS**.

15. Financial Criteria

15.1 Tenderers shall have the following minimum level of financial capacity to qualify for the performance of the Works under the Contract.

(a) the average annual **construction** turnover as specified in the **TDS** during the period specified in the **TDS;**

(b) availability of minimum liquid assets i.e working capital or credit facilities from any scheduled Bank of Bangladesh, net of other contractual commitments, of the amount as specified in the **TDS**;

(c) Satisfactory resolution of all claims under litigation cases and shall not have serious negative impact on the financial capacity of the Tenderers. All pending litigation shall be treated as resolved against the Tenderers; and

16. Personnel Capacity

16.1 Tenderers shall have the following minimum level of personnel capacity to qualify for the performance of the Works under the Contract consisting of a Construction Project Manager, Engineers, and other key staff with qualifications and experience as specified in the **TDS.**

17. Equipment Capacity

17.1 Tenderers shall own suitable equipment and other physical facilities or have proven access through contractual arrangement to hire or lease such equipment or facilities for the desired period, where necessary or have assured access through lease, hire, or other such method, of the essential equipment, in full working order, as specified in the **TDS.**

18. Joint Venture (JV)

18.1 Tenderers may participate in the procurement proceedings forming a Joint Venture(JV) by an agreement, executed case by case on a non-judicial stamp of value as specified in the **TDS** or alternately with the intent to enter into such an agreement supported by a Letter of Intent along with the proposed agreement duly signed by all legally authorised partners of the intended JV and authenticated by a Notary Public, with the declaration that the partners will execute the JV agreement in the event the Tenderer is successful.

18.2 The figures for each of the partners of a JV shall be added together to determine the Tenderer's compliance with the minimum qualifying criteria; however, for a JV under ITT Sub Clause 18.1, with number of partners as specified in the **TDS** to qualify, Leading partner and other partners must meet the criteria as specified in the **TDS.** Failure to comply with these requirements will result in non-responsiveness of the JV Tender.

18.3 Each partner of the JV shall be jointly and severally liable for the execution of the Contract, all liabilities and ethical and legal obligations in accordance with the Contract terms.

18.4 JV shall nominate the **Leading Partner** as **Representative** being entrusted with the Contract administration and management at Site who shall have the authority to conduct all business for and on behalf of any and all the partners of the JV during the Tendering process and, in the event the JV is awarded the Contract, during contract execution including the receipt of payments for and on behalf of the JV.

19. Subcontractor(s)

19.1 Tenderers may intend to subcontract an activity or part of the Works; in which case such elements and the proposed Subcontractor shall be clearly identified.

19.2 The Procuring Entity may require Tenderers to provide more information about their subcontracting arrangements. If any Subcontractor is found ineligible or unsuitable to carry out the subcontracted tasks, the Procuring Entity may request the Tenderers to propose an acceptable substitute.

19.3 A Subcontractor may participate in more than one Tender, but only in that capacity.

19.4 The Procuring Entity may also select in advance Nominated Subcontractor(s) to execute certain specific components of the Works and if so, those will be specified in the **TDS**.

19.5 The successful Tenderer shall under no circumstances assign the Works or any part of it to a Subcontractor.

D. Tender Preparation

20. Only one Tender

20.1 Tenderers shall submit only one (1) Tender for each lot, either individually or as a JV. Tenderer who submits or participates in more than one (1) Tender in one (1) lot of a package or in one (1) package with one (1) lot will cause all the Tenders of that particular Tenderer to be rejected.

21. Cost of Tendering

21.1 Tenderers shall bear all costs associated with the preparation and submission of its Tender, and the Procuring Entity shall not be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering process.

22. Issuance and Sale of Tender Document

22.1 The Procuring Entity shall make Tender Documents available immediately to the prequalified Tenderers, requesting and willing to purchase at the corresponding price by notice inviting Tender.

22.2 There shall not be any pre-conditions whatsoever, for sale of Tender Documents and the sale of such Document shall be permitted up to the day prior to the day of deadline for the submission of Tender.

23. Language of Tender

23.1 Tenders shall be written in the English language. Correspondences and documents relating to the Tender may be written in English or *Bangla.* Supporting documents and printed literature furnished by the Tenderers that are part of the Tender may be in another language, provided they are accompanied by an accurate translation of the relevant passages in the English or *Bangla* language, in which case, for purposes of interpretation of the Tender, such translation shall govern.

23.2 Tenderers shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.

24. Contents of Tender

24.1 The Tender prepared by the Tenderers will comprise the following:

(a) the Tender Submission Letter (**Form PW3-1**), as stated under ITT Sub Clause 25.1;

(b) the Tenderer Information as stated under ITT Clauses 5,29 and 32 (**Form PW3-2**);

(c) the priced BOQ for each lot in accordance with ITT Clauses 25,27and 28;

(d) the Tender Security as stated under ITT Clauses 35, 36 and 37.

(e) the alternatives, if permissible, as stated under ITT Clause 26;

(f) the written confirmation authorizing the signatory of the Tender to commit the Tenderer, as stated under ITT Sub Clause 40.3;

(g) the Valid Trade license;

(h) documentary evidence of Tax Identification Number (TIN) and Value Added Tax (VAT) as a proof of taxation obligations as stated under ITT Sub Clause 5.5;

(i) the Technical Proposal describing work plan & method, personnel, equipment and schedules as stated under ITT Clause 31;

(j) documentary evidence as stated under ITT Clause 29 and 32 establishing the Tenderer's eligibility and the minimum qualifications of the Tenderers required to be met for due performance of the Works and physical services under the Contract;

(k) document establishing legal and financial autonomy and compliance with commercial law, as stated under ITT Sub Clause5.10 in case of Procuring Entity owned entity;

(l) documentary evidence for past performance evaluation and rating matrix as stated under ITT Sub Clause 50.2; and

(m) any other document as specified in the **TDS.**

25. Tender Submission Letter and Bill of Quantities

25.1 Tenderers shall submit the Tender Submission Letter (**Form PW3-1**), which shall be completed without any alterations to its format, filling in all blank spaces with the information requested, failing which the Tender may be rejected as being incomplete.

25.2 Tenderers shall submit the priced BOQ using the form(s) furnished in **Section 12: Bill of Quantities.**

25.3 If in preparing its Tender, the Tenderer has made errors in the unit rate or the total price, and wishes to correct such errors prior to submission of its Tender, it may do so, but shall ensure that each correction is initialled by the authorised person of the Tenderer.

26. Alternatives

26.1 Unless otherwise specified in the **TDS**, alternative technical solutions shall not be considered.

26.2 When specified in ITT clause 26.1, Tenderers are permitted to submit alternative technical solutions for specified parts of the Works, and such parts will be identified in the **TDS.**

26.3 Only the technical alternatives, if any, of the lowest evaluated Tenderer conforming to the basic technical requirements will be considered by the Procuring Entity.

27. Tender Prices, Discounts and Price Adjustment

27.1 The prices and discounts quoted by the Tenderers in the Tender Submission Letter (**Form PW3-1**) and in the BOQ shall conform to the requirements specified below.

27.2 Tenderers shall fill in unit rates for all items of the Works both in figures and in words as described in the BOQ, excluding any discount offered.

27.3 The items quantified in the BOQ for which no unit rates have been quoted by the Tenderer will not be paid for, by the Procuring Entity when executed and shall be deemed covered by the amounts of other rates in the BOQ and, it shall not be a reason to change the Tender price.

27.4 The price to be quoted in the Tender Submission Letter, as stated under ITT Sub Clause 25.1, shall be the total price of the Tender, excluding any discounts offered.

27.5 Tenderers shall quote any unconditional discounts in the Tender Submission Letter as stated under ITT Sub Clause 25.1.

27.6 Tenderers wishing to offer any unconditional discount to any package or lot as applicable shall mention discount in percentage (%) in the Tender Submission Letter. Discount shall be equally applicable on all the items of BOQ and shall be applied after arithmetic correction of the tender.

27.7 All applicable taxes, custom duties, VAT and other levies payable by the Contractor under the Contract, or for any other causes, as of the date twenty-eight (28) days prior to the deadline for submission of Tenders, shall be included in the unit rates and the total Tender price submitted by the Tenderers.

27.8 Unless otherwise specified in the **TDS** and provided in the the Contract, the price of a Contract shall be fixed in which case the unit rates may not be modified in response to changes in economic or commercial conditions.

27.9 If so stated under ITT Sub Clause 27.9, Tenders are being invited with a provision for price adjustments. The unit rates quoted by the Tenderers are subject to adjustment during the performance of the Contract in accordance with the provisions of General Condition of Contract (GCC) Clause 69 and, in such case the Procuring Entity shall provide the indexes and weightings or coefficients in **Appendix to the Tender (Table 1.1 and Table 1.2)** for the price adjustment formulae as specified in the Particular Conditions of Contract (**PCC**).

28. Tender Currency

28.1 Tenderers shall quote all prices in the Tender Submission Letter and in the BOQ in Bangladesh Taka (BDT) currency.

29. Documents Establishing Eligibility of the Tenderer

29.1 Tenderers, if applying as a sole Tenderer, shall submit documentary evidence to establish its eligibility as stated under ITT Clause 5 and, in particular, it shall:

(a) complete the eligibility declarations in the Tender Submission Letter (**Form PW3-1**);

(b) complete the Tenderer Information (**Form PW3-2**);

(c) Complete Subcontractor Information (**Form PW3-4**), if it intends to engage any Subcontractor(s).

29.2 Tenderers, if applying as a partner of an existing or intended JV shall submit documentary evidence to establish its eligibility as stated under ITT Clause 5 and, in particular, in addition to as stated under ITT Sub Clause 29.1, it shall:

(a) provide for each JV partner, completed JV Partner Information (**Form PW3-3**);

(b) provide the JV agreement or Letter of Intent along with the proposed agreement of the intended JV as stated under ITT Sub Clause 18.1

30. Documents Establishing the Eligibility and Conformity of Materials, Equipment and Services

30.1 Tenderers shall submit documentary evidence to establish the origin of all Materials, Equipment and services to be supplied under the Contract as stated under ITT Clause 6.

30.2 To establish the conformity of the Materials, Equipment and services to be supplied under the Contract, the Tenderers shall furnish, as part of its Tender, the documentary evidence (which may be in the form of literature, specifications and brochures, drawings or data) that these conform to the technical specifications and standards specified in **General Specifications** and **Particular Specifications.**

31. Documents Establishing Technical Proposal

31.1 Tenderers shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in **TDS**, in sufficient detail to demonstrate the adequacy of the Tenderer's proposal to meet the work requirements and the completion time.

32. Documents Establishing the Tenderer's Qualification

32.1 Tenderers shall complete and submit the Tenderer Information (**Form PW3-2/PW3-3**) and shall include documentary evidence, as applicable to satisfy the following:

(a) general experience, of the entity (s) participating in the Tender, in construction works as stated under ITT Sub Clause 14.1(a), substantiated by the year of registration/constitution/licensing in its country of origin;

(b) specific experience, of the entity(s) participating in the Tender, in construction works under public sector of similar nature and size as stated under ITT Sub Clause 14.1(b), substantiated by Completion Certificate (s) issued by the relevant Procuring Entity(s);

33. Validity Period of Tender

33.1 Tenders shall remain valid for the period as specified in the **TDS** after the date of Tender submission deadline. A Tender valid for a period shorter than that specified will be considered, non- responsive.

34. Extension of Tender Validity and Tender Security

34.1 In exceptional circumstances, prior to the expiration of the Tender Validity period, the Procuring Entity may solicit all the Tenderers' consent to an extension of the period of validity of their Tenders; provided that those Tenderers have passed the preliminary examination as stated under ITT Sub Clause 51.3.

34.2 The request for extension of Tender Validity period shall state the new date of the validity of the Tender.

34.3 The request and the responses shall be made in writing. Validity of the Tender Security provided under ITT Clause 35 shall also be suitably extended for twenty-eight (28) days beyond the new date for the expiry of the Tender Validity. If a Tenderer does not respond or refuses the request it shall not forfeit its Tender Security, but its Tender shall no longer be considered in the evaluation proceedings. A Tenderer agreeing to the request will not be required or permitted to modify its Tender.

35. Tender Security

35.1 Tenderers shall furnish as part of its Tender, in favour of the Procuring Entity or as otherwise directed on account of the Tenderer, a Tender Security in original form (not copy) and in the amount, as specified in the **TDS**.

35.2 If the Tender is a Joint Venture, the Tenderer shall furnish as part of its Tender, in favour of the Procuring Entity or as otherwise directed on account of the title of the existing or intended JV or any of the partners of that JV or in the names of all future partners as named in the Letter of Intent of the JV, a Tender Security in original form and in the amount as stated under ITT Sub Clause 35.1.

35.3 In case of substitution of the Tender as stated under ITT Clause 46 a new Tender Security shall be required in the substituted Tender.

36. Form of Tender Security

36.1 The Tender Security shall:

(a) at the Tenderer's option, be either;

i. in the form of a Bank Draft or Pay Order, or

ii. in the form of an irrevocable unconditional Bank Guarantee issued by any scheduled Bank of Bangladesh, in the format (**Form PW3-6**), without any alteration, furnished in **Section 8: Tender and Contract Forms**;

(b) be payable promptly upon written demand by the Procuring Entity in the case of the conditions as stated under ITT Sub Clause 39.1 being invoked; and

(c) Remain valid for at least twenty-eight (28) days beyond the expiry date of the Tender Validity in order to make a claim in due course against a Tenderer in the circumstances as stated under ITT Sub Clause 39.1.

37. Authenticity of Tender Security

37.1 The authenticity of the Tender Security submitted by a Tenderer may be examined and verified by the Procuring Entity at its discretion in writing from the Bank issuing the security.

37.2 If a Tender Security is found to be not authentic, the Procuring Entity may proceed to take measures against that Tenderer as stated under ITT Sub Clause 4.4.

37.3 A Tender not accompanied by a valid Tender Security will be considered non-responsive.

38. Return of Tender Security

38.1 No Tender Security shall be returned to the Tenderers before contract signing.

38.2 Unsuccessful Tenderer's Tender Security will be discharged or returned as soon as possible but within twenty-eight (28) days after the expiry of the Tender Validity period as stated under ITT Sub Clauses 33.1.

38.3 The Tender Security of the successful Tenderer will be discharged upon the Tenderer's furnishing of the performance security and signing of the Contract Agreement.

39. Forfeiture of Tender Security

39.1 The Tender Security may be forfeited, if a Tenderer:

(a) withdraws its Tender after opening of Tenders but within the validity of the Tender as stated under ITT Clause 33 and 34; or

(b) refuses to accept a Notification of Award as stated under ITT Sub Clause 64.3; or

(c) fails to furnish Performance Security as stated under ITT Sub Clause 65.1 and 65.2; or

(d) refuses to sign the Contract as stated under ITT Sub Clause 70.2; or

(e) does not accept the correction of the Tender price following the correction of the arithmetic errors as stated under ITT Clause 55.

40. Format and Signing of Tender

40.1 Tenderers shall prepare one (1) original of the documents comprising the Tender as described in ITT Clause 24 and clearly mark it **"ORIGINAL"** In addition, the Tenderers shall prepare the number of copies of the Tender, as specified in the **TDS** and clearly mark each of them **"COPY."** In the event of any discrepancy between the original and the copies, the ORIGINAL shall prevail.

40.2 Alternatives, if permitted as stated under ITT Clause 26, shall be clearly marked "Alternative".

40.3 The original and each copy of the Tender shall be typed or written in indelible ink and shall be signed by the Person duly authorized to sign on behalf of the Tenderer. This Tender specific authorization shall be attached to the Tender Submission Letter (**Form PW3-1**). The name and position held by each Person(s) signing the authorization must be typed or printed below the signature. All pages of the original and of each copy of the Tender, except for un-amended printed literature, shall be numbered sequentially and signed by the person signing the Tender.

40.4 Any interlineations, erasures, or overwriting will be valid only if they are signed or initialled by the Person(s) signing the Tender.

E. Tender Submission

41. Sealing, Marking and Submission of Tender

41.1 Tenderers shall enclose the original in one (1) envelope and all the copies of the Tender, including the alternatives, if permitted under ITT Clause 26, in another envelope, duly marking the envelopes as "ORIGINAL (O)" "ALTERNATIVE (A)" (if permitted) and "COPY." These sealed envelopes will then be enclosed and sealed in one (1) single outer envelope.

41.2 The inner and outer envelopes shall:

(a) be addressed to the Procuring Entity at the address as stated under ITT Sub Clause 42.1;

(b) bear the name of the Tender and the Tender Number as stated under ITT Sub Clause 1.1;

(c) bear the name and address of the Tenderer;

(d) bear a statement "DO NOT OPEN BEFORE ----------" the time and date for Tender opening as stated under ITT Sub Clause 48.1;

(e) bear any additional identification marks as specified in the **TDS.**

41.3 Tenderers are solely and entirely responsible for pre-disclosure of Tender information if the envelope(s) are not properly sealed and marked.

41.4 Tenders shall be delivered by hand or by mail, including courier services at the address(s) as stated under ITT Sub Clause 42.1.

41.5 The Procuring Entity will, on request, provide the Tenderer with acknowledgement of receipt showing the date and time when it's Tender was received.

42. Deadline for Submission of Tender

42.1 Tenders shall be delivered to the Procuring Entity at the address specified in the **TDS** and not later than the date and time specified in the **TDS.**

42.2 The Procuring Entity may, at its discretion, extend the deadline for submission of Tender as stated under ITT Sub Clause 42.1, in which case all rights and obligations of the Procuring Entity and Tenderers previously subject to the deadline will thereafter be subject to the new deadline as extended.

42.3 If submission of Tenders is allowed in more than one location, the date and time, for submission of Tenders for both the primary and the secondary place(s), shall be the "**same and not different**" as specified in the **TDS.**

42.4 The Procuring Entity shall ensure that the Tenders received at the secondary place(s) are hand-delivered at the primary place as stated under ITT Sub Clause 42.1, within THREE (3) HOURS after the deadline for submission of Tenders at the secondary place (s), in case of MULTIPLE DROPPING as stated under ITT Sub Clause 42.3, as specified in the **TDS**.

43. Late Tender

43.1 Any Tender received by the Procuring Entity after the deadline for submission of Tenders as stated under ITT Sub Clause 42.1shall be declared LATE and returned unopened to the Tenderer.

44. Modification, Substitution or Withdrawal of Tender

44.1 Tenderers may modify, substitute or withdraw its Tender after it has been submitted by sending a written notice duly signed by the authorized signatory and properly sealed, and shall include a copy of the authorization ; provided that such written notice including the affidavit is received by the Procuring Entity prior to the deadline for submission of Tenders as stated under ITT Clause 42.

45. Tender Modification

45.1 Tenderers shall not be allowed to retrieve its original Tender, but shall be allowed to submit corresponding modification to its original Tender marked as "**MODIFICATION (M)".**

46. Tender Substitution

46.1 Tenderers shall not be allowed to retrieve its original Tender, but shall be allowed to submit another Tender marked as **"SUBSTITUTION (S)".**

47. Tender Withdrawal

47.1 Tenderers shall be allowed to withdraw its Tender by a Letter of Withdrawal marked as **"WITHDRAWAL(W)".**

F. Tender Opening and Evaluation

48. Tender Opening

48.1 Tenders shall be opened immediately after the deadline for submission of Tenders at the primary place as specified in the **TDS** but not later than **ONE HOUR** after expiry of the submission deadline at the same primary place unless otherwise stated under ITT Sub Clause 48.2.

48.2 If submission of Tenders is allowed in more than one location as stated under ITT Sub Clause 42.3 and 42.4, Tenders shall be opened, immediately after receipt of Tenders from all the secondary place(s), at the primary place at the date and time as stated under ITT Sub Clause 48.1.

48.3 Persons not associated with the Tender may not be allowed to attend the public opening of Tenders.

48.4 Tenderers' representatives shall be duly authorised by the Tenderer. Tenderers or their authorised representatives will be allowed to attend and witness the opening of Tenders, and will sign a register evidencing their attendance.

48.5 The authenticity of withdrawal or substitution of, or modifications to original Tender, if any made by a Tenderer in specified manner, shall be examined and verified by the Tender Opening Committee (TOC) based on documents submitted as stated under ITT Sub Clause 44.1.

48.6 Ensuring that only the correct (M), (S), (A), (O) envelopes are opened, details of each Tender will be dealt with as follows:

(a) the Chairperson of the TOC will read aloud each Tender and record in the Tender Opening Sheet (TOS):

(i) the name and address of the Tenderer;

(ii) state if it is a withdrawn, modified, substituted or original Tender;

(iii) the Tender price;

(iv) the official cost estimate;

(v) any discounts;

(vi) any alternatives;

(vii) the presence or absence of any requisite Tender Security; and

(viii) such other details as the Procuring Entity, at its discretion, may consider appropriate

(b) only discounts and alternatives read aloud at the Tender opening will be considered in evaluation.

(c) all pages of the original version of the Tender, except for un-amended printed literature, will be initialled by members of the TOC.

48.7 Upon completion of Tender opening, all members of the TOC and the Tenderers or Tenderer's duly authorised representatives attending the Tender opening shall sign by name, address, designation, the TOS, copies of which shall be issued to the Head of the Procuring Entity or an officer authorised by him or her and also to the members of the TOC and any authorised Consultants and, to the Tenderers immediately.

48.8 The omission of a Tenderer's signature on the record shall not invalidate the contents and effect of the record under ITT Sub Clause 48.6.

48.9 No Tender will be rejected at the Tender opening stage except the LATE Tenders as stated in the ITT Clause 43.

49. Evaluation of Tenders

49.1 Tenders shall be examined and evaluated only on the basis of the criteria specified in the Tender Document.

49.2 **Tender Evaluation Committee** (**TEC**) shall examine, evaluate and compare Tenders that are responsive to the requirements of Tender Documents in order to identify the successful Tenderer.

49.3 Tenderers having quoted the tender price more than 10 (Ten) percent above or below the official cost estimate, will have to submit the analysis of rates of the items as required by the PMC.

50. Evaluation Process

50.1 TEC may consider a Tender as responsive in the Evaluation, only if it is submitted in compliance with the mandatory requirements set out in the Tender Document. The evaluation process should begin immediately after Tender opening following four steps:

(a) Preliminary examination

(b) Technical examination and responsiveness

(c) Financial evaluation and price comparison

(d) Post-qualification of the Tender.

50.2 In case of tie for the evaluated price the Tenderer shall be selected by Lottery conducted in presence of the Tenderer's Representative like to be present in the Lottery.

51. Preliminary Examination

51.2 TEC shall examine the Tenders to confirm that all documentation as stated under ITT Clause 24 has been provided, to determine the completeness of each document submitted.

51.3 TEC shall confirm that the following documents and information have been provided in the Tender. If any of these documents or information is missing, the Tender shall be considered rejected.

(a) Tender Submission Letter;

(b) Priced Bill of Quantities;

(c) Written confirmation authorizing the signatory of the Tender to commit the Tenderer; and

(d) Valid Tender Security.

52. Technical Responsiveness and Technical Evaluation

52.1 TEC's determination of a Tender's responsiveness is to be based on the contents of the Tender itself without recourse to extrinsic evidence.

52.2 A responsive Tender is one that conforms in all respects to the requirements of the Tender Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that:

(a) affects in any substantial way the scope, quality, or performance of the Works and physical services specified in the Contract; or

(b) limits in any substantial way, or is inconsistent with the Tender Documents, the Procuring Entity's rights or the Tenderer's obligations under the Contract; or

(c) if rectified would unfairly affect the competitive position of other Tenderers presenting responsive Tenders.

During the evaluation of Tenders, the following definitions shall apply:

"Deviation" is a departure from the requirements specified in the Tender Document;

"Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Tender Document; and

"Omission" is the failure to submit part or all of the information or documentation required in the Tender Document.

52.3 If a Tender is not responsive to the mandatory requirements set out in the Tender Document, shall not subsequently be made responsive by the Tenderer by correction of the material deviation, reservation, or omission.

52.4 There shall be no requirement as to the minimum number of responsive Tenders.

52.5 There shall be no automatic exclusion of Tenders which are above or below the official estimate except ITT sub-Clause 49.3.

52.6 TEC shall evaluate the aspects of the Tender submitted as stated under ITT Clauses 29, 30,31 and 32 and, to confirm that all requirements specified in General Specifications and Particular Specifications of the Tender Document have been met without any material deviation, reservation or omission.

52.7 Provided that a Tender is responsive, TEC may request that the Tenderer submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the Tender related to documentation requirements. Such omission shall not be related to any aspect of the rates of the Tender reflected in the Priced BOQ or any mandatory criteria. Failure of the Tenderer to comply with the request may result in the consideration of its Tender as non-responsive.

52.8 TEC may regard a Tender as responsive even if it contains;

(a) minor or insignificant deviations which do not meaningfully alter or depart from the technical specifications, characteristics and commercial terms and, conditions or other mandatory requirements set out in the Tender Document; or

(b) errors or oversights, that if corrected, would not alter the key aspects of the Tender.

53. Clarification on Tender

53.1 TEC may ask Tenderers for clarification of their Tenders, including breakdowns of unit rates, in order to facilitate the examination and evaluation of Tenders. The request for clarification by the TEC and the response from the Tenderer shall be in writing, and Tender clarifications which may lead to a change in the substance of the Tender or in any of the key elements of the Tender as stated under ITT Sub Clause 52.2, will neither be sought nor be permitted.

53.2 Changes in the Tender price shall also not be sought or permitted, except to confirm the correction of arithmetical errors discovered by the TEC in the evaluation of the Tenders, as stated under ITT Sub Clause 55.1.

53.3 Any request for clarifications by the TEC shall not be directed towards making an apparently non-responsive Tender responsive and reciprocally the response from the concerned Tenderer shall not be articulated towards any addition, alteration or modification to its Tender.

53.4 If a Tenderer does not provide clarifications of its Tender by the date and time, its Tender shall not be considered in the evaluation

54. Restrictions on Disclosure of Information

54.1 Following the opening of Tenders until issuance of Notification of Award no Tenderer shall, unless requested to provide clarification to its Tender or unless necessary for submission of a complaint, communicate with the concerned Procuring Entity

54.2 Tenderers shall not seek to influence in anyway, the examination and evaluation of the Tenders

54.3 Any effort by a Tenderer to influence the Procuring Entity in its decision concerning the evaluation of Tenders, Contract awards may result in the non-responsiveness of its Tender as well as further action in accordance with Section 64 (5) of the Public Procurement Act, 2006.

54.4 All clarification requests shall remind Tenderers of the need for confidentiality and that any breach of confidentiality on the part of the Tenderer may result in their Tender being non-responsive.

55. Correction of Arithmetical Errors

55.1 Provided that the Tender is responsive, the TEC shall correct arithmetical errors on the following basis:

(a) if there is a discrepancy between the unit price and the line item total price that is obtained by multiplying the unit price and quantity, the unit price will prevail and the line item total price shall be corrected, unless in the opinion of the TEC there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted will govern and the unit price will be corrected; and

(b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

(c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

55.2 TEC shall correct the arithmetic errors and shall promptly notify the concerned Tenderer(s).If the Tenderer does not accept the correction of arithmetic errors, its Tender shall be rejected.

56. Financial Evaluation

56.1 TEC will evaluate each Tender that has been determined, up to this stage of the evaluation, to be responsive to the requirements set out in the Tender Document.

56.2 To evaluate a Tender, the TEC will consider the following:

(a) the Tender price, excluding Provisional Sums and the provision, if any, for contingencies in the priced BOQ, but including Day work items ;

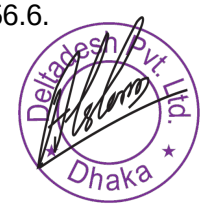
(b) adjustments for correction of arithmetical errors, as stated under ITT Sub Clause 55.1;

(c) adjustments in order to take into consideration the unconditional discounts as stated under ITT Sub Clause 27.5 and 27.6, if any..

56.3 Variations, deviations, alternatives and other factors which are in excess of the requirements of the Tender Document or otherwise result in unsolicited benefits for the Procuring Entity will not be taken into account in Tender evaluation.

56.4 The estimated effect of any price adjustment provisions under GCC Clause 71, applied over the period of execution of the Contract, will not be taken into account in Tender evaluation.

56.5 If so indicated in the ITT Sub Clause 1.1 the Procuring Entity may award one or multiple lots to one Tenderer following the methodology specified in ITT Sub Clause 56.6.



56.6 To determine the lowest-evaluated lot/package the TEC will take into account:

(a) the lowest-evaluated Tender for each lot;

(b) the resources sufficient to meet the qualifying criteria for the individual lot or aggregate of the qualifying criteria for the multiple lots;

(c) the price reduction on account of discount per lot/package as offered by the Tenderer in its Tender; and

(d) the Contract-award sequence that provides the optimum economic combination on the basis of least overall cost of the total Contract package taking into account any limitations due to constraints in Works or execution capacity determined in accordance with the tender capacity as stated in ITT Sub Clause 15.1 (d) and post-qualification criteria as stated under ITT Clause 59.

56.7 TEC may recommend to increase the amount of the Performance Security above the amounts as stated under ITT Sub Clause 65.1 but not exceeding twenty-five (25) percent of the Contract Price, if in the opinion of TEC, it is found that the Tender is significantly below the updated official estimated cost or unbalanced as a result of front loading.

57. Price Comparison

57.1 TEC shall compare all responsive Tenders to determine the lowest-evaluated Tender, as stated under ITT Clause 56.

57.2 In the extremely unlikely event that there is a tie for the lowest evaluated price, the Tenderer with the superior past performance as stated in ITT sub-clause 50.2 shall be selected.

57.3 In the event that there is a tie for the lowest price and none of the Tenderers has the record of past performance with the Procuring Entity as stated under ITT Sub Clause 57.2, then the Tenderer shall be selected, subject to firm confirmation through the Post-qualification process, after consideration as to whether the Tenderer has demonstrated in its Tender superior past performance with the other Procuring Entities or a more efficient work programme and work methodology.

57.4 The successful Tenderer as stated under ITT Sub Clause 57.1, 57.2 and 57.3 shall not be selected through lottery under any circumstances.

58. Negotiations

58.1 No negotiations shall be held during the Tender evaluation or award, with the lowest or any other Tenderer.

58.2 The Procuring Entity through the TEC may, however, negotiate with the lowest evaluated Tenderer with the objective to reduce the Contract Price by reducing the scope of works or a reallocation of risks and responsibilities, only when it is found that the lowest evaluated Tender is significantly higher than the official estimated cost; the reasons for such higher price being duly investigated.

58.3 If the Procuring Entity decides to negotiate for reducing the scope of the requirements under ITT Sub Clause 58.2, it will be required to guarantee that the lowest Tenderer remains the lowest Tenderer even after the scope of work has been revised and shall further be ensured that the objective of the Procurement will not be seriously affected through this reduction.

58.4 In the event that the Procuring Entity decides because of a high Tender priceto reduce the scope of the requirements to meet the available budget, the Tenderer is not obliged to accept the award and shall not be penalised in any way for un-accepting the proposed award.

59. Post-qualification

59.1 The determination on Post-qualification shall be based upon an examination of the documentary evidence of the Tenderer's qualifications submitted by the Tenderer, pursuant to ITT Clause 32, clarifications as stated under ITT Clause 53 and the qualification criteria indicated in ITT Clauses 12 to 17. Factors not included therein shall not be used in the evaluation of the Tenderer's qualification.

59.2 An affirmative determination shall be a prerequisite for award of the Contract to the Tenderer. A negative determination shall result in non-responsiveness of the Tenderer's Tender, in which event the Procuring Entity shall proceed to the next lowest evaluated Tender to make a similar determination of that Tenderer's capabilities to perform the Contract satisfactorily, if awarded.

59.3 TEC may verify information contained in the Tender by visiting the premises of the Tenderer as a part of the post qualification process, if practical and appropriate.

60. Procuring Entity's Right to Accept any or to Reject Any or All Tenders

60.1 The Procuring Entity reserves the right to accept any Tender or to reject any or all the Tenders any time prior to contract award and , to annul the Procurement proceedings with prior approval of the Head of the Procuring Entity, any time prior to the deadline for submission of Tenders following specified procedures, without thereby incurring any liability to Tenderers, or any obligations to inform the Tenderers of the grounds for the Procuring Entity's action.

61. Rejection of All Tenders

61.1 The Procuring Entity may, in the circumstances as stated under ITT Sub Clause61.2 reject all Tenders following recommendations from the TEC only after the approval of such recommendations by the Head of the Procuring Entity.

61.2 All Tenders can be rejected, if -

(a) the price of the lowest evaluated Tender exceeds the official estimated cost, provided the estimate is realistic, subject to ITT Sub Clause 58.2 ; or

(b) there is evidence of lack of effective competition; such as non-participation by a number of potential Tenderers; or

(c) the Tenderers are unable to propose completion of the contract within the stipulated time in its Tender, though the stipulated time is reasonable and realistic; or

(d) all Tenders are non-responsive; or

(e) evidence of professional misconduct, affecting seriously the Procurement process, is established pursuant to Rule 127 of the Public Procurement Rules, 2008

61.3 61.3 Notwithstanding anything contained in ITT Sub-Clause 61.2 Tenders may not be rejected if the lowest evaluated price is in conformity with the market price.

62. Informing Reasons for Rejection

62.1 Notice of the rejection will be given promptly within seven (7) working days of decision taken by the Procuring Entity to all Tenderers and, the Procuring Entity will, upon receipt of a written request, communicate to any Tenderer the reason(s) for its rejection but is not required to justify those reason(s).

G. Contract Award

63. Award Criteria

63.1 The Procuring Entity shall award the Contract to the Tenderer whose Tender is responsive to all the requirements of the Tender Document and that has been determined to be the lowest evaluated Tender, provided further that the Tenderer is determined to be Post-qualified in accordance with ITT Clouse 59.

63.2 Tenderer will not be required, as a condition for award, to undertake responsibilities not stipulated in the Tender Documents, to change its price, or otherwise to modify its Tender.

64. Notification of Award

64.1 Prior to the expiry of the Tender Validity period and within one (1) week of receipt of the approval of the award by the Approving Authority, the Procuring Entity shall issue the Notification of Award (NOA) to the successful Tenderer.

64.2 The NOA, attaching the contract as per the sample (**Form PW3-8**) to be signed, shall state:

(a) the acceptance of the Tender by the Procuring Entity;

(b) the price at which the contract is awarded;

(c) the amount of the Performance Security and its format;

(d) the date and time within which the Performance Security shall be furnished; and

(e) the date and time within which the Contract shall be signed.

64.3 The NOA shall be accepted by the successful Tenderer within seven (7) working days from the date of its issuance.

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64.4 Until a formal contract is signed, the NOA will constitute a Contract, which shall become binding upon the furnishing of a Performance Security and the signing of the Contract by both parties.

65. Performance Security

65.1 Performance Security shall be provided by the successful Tenderer in BDT currency, of the amount as specified in the **TDS**.

65.2 The Procuring Entity shall increase the amount of the Performance Security on the recommendation of TEC above the amounts as stated under ITT Sub Clause 56.7.

65.3 The proceeds of the Performance Security shall be payable to the Procuring Entity unconditionally upon first written demand as compensation for Contractor's failure to complete its obligations under the Contract.

65.4 In the event a Procuring Entity owned enterprise as stated under ITT Sub Clause 5.10 is the successful Tenderer, Performance Security, as stated under ITT Sub Clause 65.1, shall not be required and, in lieu, there shall be Retention Money as specified in the **TDS.**

66. Form and Time Limit for Furnishing of Performance Security

66.1 Performance Security, as stated under ITT Clause 65, may be in the form of a Bank Draft, Pay Order or an irrevocable unconditional Bank Guarantee in the format (**Form PW3-10**), without any alteration, issued by any scheduled Bank of Bangladesh acceptable to the Procuring Entity.

66.2 Within fourteen (14) days from the date of acceptance of the NOA but not later than the date specified therein, the successful Tenderer shall furnish the Performance Security for the due performance of the Contract in the amount as stated under ITT Sub Clauses 65.1 or 65.2.

67.Validity of Performance Security

67.1 Performance Security shall be required to be valid until a date twenty-eight (28) days beyond the Intended Completion Date as specified in Tender Document.

68. Authenticity of Performance Security

68.1 The Procuring Entity shall verify the authenticity of the Performance Security submitted by the successful Tenderer by sending a written request to the branch of the Bank issuing the Pay Order, Bank Draft or irrevocable unconditional Bank Guarantee in specified format.

69. Contract Signing

69.1 At the same time as the Procuring Entity issues the NOA, the Procuring Entity will send the draft Contract Agreement and all documents forming the Contract to the successful Tenderer.

69.2 Within twenty–eight (28) days of the issuance of the NOA, the successful Tenderer and the Procuring Entity shall sign the contract. In the event the successful Tenderer is a JV, all partners of that JV must sign.

69.3 Failure of the successful Tenderer to submit the Performance Security, as stated under ITT Sub Clause 65.1, or to sign the Contract, as stated under ITT Sub Clause69.2, shall constitute sufficient grounds for the annulment of the award and forfeiture of the Tender Security. In that event the Procuring Entity may award the Contract to the next lowest evaluated responsive Tenderer, who is determined by the TEC to be qualified to perform the Contract satisfactorily.

70. Publication of Notification of Award of Contract

70.1 The NOA for Contract shall be notified by the Procuring Entity to the Central Procurement Technical Unit within seven (**7**) days of its issuance for publication in their website, and that notice shall be kept posted for not less than a month.

71. Debriefing of Tenderers

71.1 Debriefing of Tenderers by the Procuring Entity shall outline the relative status and weakness only of his or her Tender requesting to be informed of the grounds for not accepting the Tender submitted by him or her, without disclosing information about any other Tenderer.

71.2 In the case of debriefing, confidentiality of the evaluation process shall be maintained.

72. Adjudicator

72.1 The Procuring Entity proposes the person named in the **TDS** to be appointed as Adjudicator under the Contract, at an hourly fee and for those reimbursable expenses as specified in the **TDS**.

73. Right to Complain

73.1 Tenderer has the right to complain in accordance with the Public Procurement Act 2006 and the Public Procurement Rules, 2008.

SECTION-4: INFORMATION TO BE PROVIDED WITH THE TENDER

- Appraisal of Technical Proposal

Tenderers are required to submit a Technical Proposal together with a separate, sealed Commercial Proposal. Weightage of Technical and Commercial offer shall consider as 40 (Technical): 60 (Commercial) for bid evaluation and awarding purpose. Only those Tenderers, who fulfill the technical submittal selection criteria, comply with all technical mandatory requirements, and obtain a minimum technical score of 75%, will have their commercial bids opened and reviewed

No.	Particulars	Max Points
1	**Pre-Qualification Submittals**	**40**
	a. General Experience	10
	b. Personnel Capabilities	10
	c. Equipment Capabilities	10
	d. Financial Position	10
2	**Methodology**	**20**
	a. Proposed Site arrangement and facility management	5
	b. Proposed Work Methodology	5
	c. Proposed Documentation Methodology	5
	d. Proposed HSE Policy	5
3	**Schedule**	**25**
	a. Proposed Schedule of Works	10
	b. Proposed Procurement Schedule of Long lead Items	10
	c. Proposed Schedule of Plant & Equipment to be used at Project	5
4	**Organogram**	**10**
	a. Proposed Key Personnel	5
	b. Proposed Organization Chart and list of Sub-contractors	5
5	**Organized Document Presentation**	**05**
	Total=	**100**

- Alternate Proposals (if any)
- Statement of Site Visit
- To be submitted at the discretion of the Tenderer
- Mandatory—To be provided with the Technical Proposal as per the text provided herein
- **Assessment Guideline**

1a. General Experience

Sl.	Description	Maximum Points
i)	Projects of similar nature and complexity completed over last 05 years. he required minimum number of similar contracts constructed shall be 5 (five) over a period of last Five (Five) years.	5
	Projects of similar nature and complexity in hand.	2.5
	Status of enlistment with Government Organizations and other agencies.	2.5
	Sub-total	**10**

1b. Personal Capabilities

Sl. No	Description	Maximum Points
i)	Graduate Engineers Registered with IEB/RAJUK	5
	Number of Engineers	2.5
	Experience of Engineers in number of years	2.5
ii)	Number of Diploma Engineers in Employment of the Firm	5
	Number of Engineers	2.5
	Experience of Engineers in number of years	2.5
	Sub-total	**10**

1c. Equipment Capabilities

Sl. No	Description	Maximum Points
i)	List and extent of relevant owned equipment to carry out the works as per international standard.	10
	Sub-total	**10**

1d. Financial Position

Sl. No	Description	Maximum Points
i)	Available Bank Solvency	5
ii)	Working Capital in last 5 years	2.5
iii)	Blacklisting from any Agency	2.5
iv)	Dispute History with Project Budget	2.5
	Sub-total	**10**

2a. Proposed Site arrangement and facility management

Site Layout identifying offices, labor rest areas, toilets, laydown areas, and access and egress requirements. The Contractor shall in accordance provide a description of his offsite construction camp's facilities. The Contractor shall be responsible for pumps, electrical power, water and electrical distribution systems, and sewerage system including all fittings, pipes and other items necessary for servicing the Contractor's construction camp. The Tenderer shall list or explain his plans for providing these facilities for the service of the Contract as follows:

- Site preparation (clearing, land preparation etc.)
- Power (expected power load etc.)
- Water (required amount and system proposed)
- Sanitation (Sewerage disposal system etc.)
- Contractor's office, workshop and work areas (areas required and proposed layout, type of construction of buildings etc.) Warehouse and storage areas (area required, type of construction and layout)
- Worker's Rest and Meal area
- Construction Equipment. Assembly and preparation (detailed plans for carrying out this activity)
- A fully serviced and cleaned, Site Office for Engineer at site together with access to reasonable toilet facilities, internet, printing and air-conditioning. Other items proposed (security services etc.)

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2b. Proposed Work Methodology

Method Statement consisting of a maximum of 4 pages of narrative clearly explaining how the Tenderer proposes to manage and execute the Works. The narrative should indicate in detail and include but not be limited to:

- Mobilization in the Country, the type of facilities including personnel accommodation, office accommodation, provision for maintenance and for storage, communications, security and other services to be used.
- The method of executing the overall Works including major finishing works, the procedures for installation of equipment and machinery and transportation of equipment and materials to the site. The method of execution should clearly demonstrate the Contractors planning to complete the work within the period stated in Appendix to Tender and should be supported by the details, types of equipment and other resources proposed to be used with production rates commensurate with the quantities of major items of work. The incorporation of any method statement represents an acknowledgement only of the manner in which the Contractor intends to execute his work. It is not an agreement or acceptance of how any part of the Works can or should be executed. If the methods intended prove to be impractical or impossible to perform then it is the Contractor's responsibility to devise and enact revised methods to fulfil the contractual obligations.

2c. Proposed Documentation Methodology

- Tender should provide formats of following documents (not limited to) for assessment.
- Sample of RFI (Request for Information)
- Sample of FIR (Field Inspection Request)
- Sample of MIR (Material Inspection Request)
- Sample of Shop Drawing Tracker
- Sample of As Built Drawing Tracker
- Sample of Material Approval Tracker
- Sample of Periodic Progress and Photo Report

3a. Proposed Schedule of Works

- Detailed (Floor-by-Floor) Program of works identifying the critical path and key milestones
- Detailed program shall be in accordance with the requirements in the Specifications including major finishing works. The program should clearly indicate the required time for mobilization, construction, commissioning, and handover and sign off.

3b. Proposed Procurement Schedule of Long Lead Items

- Detailed Program of works shall contain
- Materials details
- Supplier and origin details
- Production Time
- Shipping/Delivery Time
- Port Clearance Time (If Applicable)
- Site requirement time

3c. Proposed Schedule of Plant and Equipment

Schedule of Plant and Equipment to be used on the project including statements of what equipment is owned and what will be hired. The Tenderer will provide a schedule of all major equipment and related items, under separate heading for items owned, to be purchased or to be arranged on lease by him to carry out the Works. The information shall include make, type,

capacity, and anticipated period of utilization for all equipment which shall be in sufficient detail to demonstrate fully that the equipment will meet all requirements of the Specifications.

4a. Proposed Key Personnel

Proposed key personnel including two-page resume listing qualifications, years of experience and relevant projects. The Tenderer shall detail below the names of the key personnel who shall be responsible for the Works should his tender be accepted. These details shall include (but shall not be limited to) qualifications, relevant experience and current position held within the Tenderer's organization. The Employer reserves the right to interview the Key Personnel prior to award of the Contract, which may form part of the Tender evaluation process. Key personnel will be subject to the approval of the Engineer.

4b. Proposed Organization Chart and List of Sub Contractor (If any)

The proposed organization chart including the Project Director in charge and any Head Office support staff and functions. Also, details of subcontractors to be provided in the similar manner.

Alternate Proposal (if any)

Proposed alternatives to compliant Bill of Quantities listing alternatives which can include alternative details, materials, payments etc. If the Tenderer wishes or is required to submit an alternative tender to that required in accordance with the Tender Documents, details of such alternative should be stated below. No alternative tender shall be considered unless a compliant tender is submitted as well.

Statement of Site Visit

From: _____

_____

To: _____

_____

Statement of Site Visit

Tender for……

We hereby confirm that we have visited the Site and have inspected and satisfied ourselves with the site data provided. We have no queries on any matter concerning the Tender in connection with prevailing Site conditions.

Signature of the Tenderer:……

Name: _____

Position: _____

Date: _____

SECTION-4: TENDER DATA SHEET

Instructions for completing Tender Data Sheet are provided in italics in parenthesis for the relevant ITT clauses	
ITT Clause	**Amendments of, and Supplements to, Clauses in the Instructions to Tenderers**
A. General	
ITT 1.1	The Procuring Entity is: **Bengal Hotels & Resorts Limited** Address: Bengal House, 75 Gulshan Avenue Dhaka -1212, Bangladesh. Project Management Consultant (PMC): **Deltadesh (Pvt.) Ltd.** Address: PMC Project Office Oriental Hasnahena, Apt. # B5, Plot # 49 & 51, Road # 6, Block- C, Niketon, Gulshan 1, Dhaka- 1212 E-mail: imrul@deltadesh.com Mobile: +8801711505845 **The Name of the Project is:** Bengal Hotel and Resorts Project (swissôtel Dhaka) at 208 Tejgaon - Gulshan, Link Road, Dhaka, Bangladesh.
	The Name of the Tender is: Design, Supply, Fabricating, Fitting and Fixing of Semi-Unitized Façade System
ITT3.1	The source of funds is the Procuring Entity's Own Fund
ITT 3.3	**The name of the Development Partner is :** INTERNATIONAL FINANCE CORPORATION (IFC) and IDCOL
ITT5.1	Tenderers from the following countries are not eligible: **Israel**
ITT6.1	Materials, Equipment and associated services from the following countries are not eligible: **Israel**
B. Tender Document	
ITT 8.2	The following are authorised agents/offices of the Procuring Entity for the purpose of issuing the Tender Document: Project Management Consultant (PMC): **Deltadesh (Pvt.) Ltd.** Address: PMC Project Office Oriental Hasnahena, Apt. # B5, Plot # 49 & 51, Road # 6, Block- C, Niketon, Gulshan 1, Dhaka- 1212 E-mail: imrul@deltadesh.com Mobile: +8801711505845
ITT9.1	For **clarification of Tender Document purposes** only, the Procuring Entity's address is: Project Management Consultant (PMC): **Deltadesh (Pvt.) Ltd.** Address: PMC Project Office Oriental Hasnahena, Apt. # B5, Plot # 49 & 51, Road # 6, Block- C, Niketon, Gulshan 1, Dhaka- 1212 E-mail: imrul@deltadesh.com

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	Mobile: +8801966614018
ITT10.1	A Pre-Tender Meeting Will Be Held On 20-08-2024 At 11.00AM The Office Of The Project Director Of Procuring Entity At House No- 4, Road No- 7, Block- C, Niketon, Dhaka (near 2nd Gate).
C. Qualification Criteria	
ITT 14.1(a)	The minimum years of general experience of the Tenderer in the façade industry work shall be Five (5) years. Tenderer/Company's Capability: Part A: Contractor's Legal Title: Year of Establishment: Trade License No.: Registration Certificate No.: VAT Registration Certificate No.: TIN Certificate No.: Part B: Management Capability Part C: Environment, Health and Safety Policy of the Tenderer's Organization,
ITT 14.1(b)	The minimum of years of general experience of the Tenderer in façade industry work shall be Five (5) years.
ITT 15.1(c)	Not applicable.
ITT 15.1(d).	Not Applicable.
ITT 16.1	The following personnel shall be deputed in the site during execution of the work and documentary evidence of Curriculum Vitae (CV) along with photograph, educational qualification certificates, Appointment letter of contractor firm should be submitted otherwise Tender may be considered as non-responsive.

	SL	**Proposed Position**	**Qualification**	**Total Works Experience (years)**	**In Similar Works Experience (years)**
	01.	Project Manager (1)	BSc. in Civil Engineering	Minimum 05 (Five) years	03 years
	02.	EHS In charge (1)	Graduated	Minimum 05(five) years	03 years
	02.	Site Engineer, Civil (2)	Diploma in Civil Engineering	Minimum 05(five) years	03 years

ITT 17.1	The Tenderer shall own or have proven access to hire or lease of the major construction equipment's, in full working order as follows scanned copies of documentary evidence shall be submitted otherwise Tender may be considered as non-responsive.
	The method of executing the overall Works including major finishing works, the procedures for installation of equipment and machinery and transportation of equipment and materials to the site. The method of execution should clearly demonstrate the Contractors planning to complete the work within the period stated in Appendix to Tender and should be supported by the details, types of equipment and other resources proposed to be used with production rates commensurate with the quantities of major items of work.
ITT 18.1	The value of non-judicial stamp for execution of the Joint Venture Agreement shall be Tk. 300.00 only

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ITT 18.2	The leading partner must meet 60% of the qualification criteria and others partners shall meet at least 40% of the qualifying criteria. The numbers of joint ventures partners shall not be more than 1(one)
D. Tender Preparation	
ITT 24.1 (m)	Not applicable.
ITT 26.1	Alternatives will not be permitted.
ITT 27.9	The prices quoted by the Tenderers shall be fixed for the duration of the Contract.
ITT 31.1	The required Technical Proposal shall include the following additional information: Not Applicable
ITT 33.1	The Tender Validity period shall be 30 (Thirty) days.
ITT 35.1	The amount of the Tender Security shall be Tk. *… … … … (Taka … … … …) only in favour of Bengal Hotels and Resorts Ltd in the form of Pay Order/Bank Draft from any Schedule Bank of Bangladesh*
ITT 40.1	In addition to the original of the Tender, *1(one)* copy shall be submitted.
ITT 50.2	Not applicable.
ITT 72.1	Adjudicator may be appointed by mutual understanding between BHRL/PMC and the Contractor
E. Tender Submission	
ITT 41.2(e)	The inner and outer envelopes shall bear the following additional identification marks: *[state the name and/or number that must appear on the Tender envelope to identify this specific Tendering process]*
ITT 42.1	**For Tender submission purposes** <u>Project Management Consultant (PMC):</u> **Deltadesh (Pvt.) Ltd.** Address: PMC Project Office Oriental Hasnahena, Apt. # B5, Plot # 49 & 51, Road # 6, Block- C, Niketon, Gulshan 1, Dhaka- 1212 E-mail: imrul@deltadesh.com Mobile: +8801966614018 The deadline for submission of Tenders is: Time & Date: 3:00 Pm, 01-09-2024
F. Tender Opening and Evaluation	
ITT 48.1	The Tender opening shall take place at: **Bengal Hotels and Resorts Limited** Address: Project Office House No- 4, Road No- 7, Block- C, Niketon (near 2nd Gate), Dhaka. The deadline for submission of Tenders is: Time & Date: 3:00 Pm, 01-09-2024
ITT 49.3	Tender shall have to submit analysis of Item Rates if his quoted Total Amount is above or below 10% (Ten Percent) of the official Cost Estimate prepared by the PMC
G. Contract Award	
ITT 65.4	The Retention Money shall be deducted @ 5%-10% (Five to Ten Percent) which depends upon the availability of the Bank Guarantee (BG) from the successful Tenderer's payable invoices during Contract implementation, if awarded the Contract.

SECTION-06: SCOPE OF WORKS

1.1 Introduction

The project is located at Dhaka City in Bangladesh. The scope of facade shall be as described as follows and on the Tender Drawings, including but not limited to:

- All glass curtain walls;
- All aluminum cladding systems;
- All external window system;
- All aluminum skylight system;
- All louvers and grills;
- All Grills soffit claddings;
- All glass or metal balustrades related to facades;
- All metal claddings to external columns and beams;
- All canopies above entrance doors;
- All entrance doors at first floor;
- All glass or metal panel features on building roof, including but not limited to parapet coping, cantilevered glass walls and claddings;
- All stainless-steel gutters integrated into façade (exclusive drainage pipe and hoppers);
- All lightning proofing systems integrated with façade systems;
- Other systems related to facade and requested by client in bidding quantity list.

1.2 Façade components

The Facade Contractor shall provide labor, materials, equipment, and related items and shall also design, engineer, test, fabricate, deliver, install, maintain and guarantee a complete, watertight exterior and interior wall system, and all the works described herein, including but without being limited to the following:

- Glass, metal sheets, mullions, transoms, glazing accessories, thermal break material, gaskets, acoustic buffers, sealants, flashings, vents, doors, hardware, ironmongery, multi point locks, electric vent drivers, opening limit devices, louvers, blanked off panels, bird screens, cleats, fixings, components to prevent galvanic action, interior aluminum trimming, Steel, etc.
- Roof maintenance systems, including fall arrest device, cables and fasteners.
- Tie back socket of Building Maintenance Unit (BMU) systems which should be integrated into the façade system. Locations are subject to BMU contractor's comments.
- Cornice, soffit panels and other works connected with facade and within the scope of Contract.
- All other cladding systems including but not limited to aluminum, stainless steel all associated components and fixings.
- The Facade Contractor shall be responsible for shop drawings, design, supply, surveying and installation of all cast-in items.
- All fire safety material, smoke seals, sound and thermal insulation, vapor retardant panels, fixings, anchorages and associated seals shall be included. Interior partition closures, cement board walling tapes and foam shall be supplied and installed by the Façade Contractor.
- Secondary steel frames or other support systems for facade cladding, soffits, external architectural features, lightning rod together with fixings back to the building are to be supplied and installed by the Façade Contractor.

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- Should the electrical conduits for signage and lighting be integrated into the façade system, these conduits shall be supplied and installed by the Façade Contractor. Lightning protection tabs to facilitate electrical continuity between façade panels shall be provided and installed by Façade Contractor. Earthing tabs shall be provided by Façade Contractor, while provisions of locations to the base structure shall be coordinated with the E&M Contractor and Main Contractor. Earthing connections shall be the responsibility of the E&M Contractor.
- The following works are provided by the E&M Sub Contractor: connection of gutters and flashed areas to drainage pipes, light mountings, lightning protection harness/systems, wiring, and lights not attach to curtain wall. However, the façade contractor is responsible for the interfacing seal to make sure a good weather performance.

1.3 Interfaces

The Facade Contractor is required to make provision for interfacing and coordinating with other trades, services and systems on site being carried out under separate contracts. The trades that are to be considered are listed but not limited to as follows:

- Primary and secondary structures (reinforced concrete and steel)
- All building mechanical and electrical systems (HVAC, Plumbing and Drainage, Fire Services, LV, ELV, lighting, etc)
- Internal partitions, balustrades and wall finishes (other than cement board walling which is included in this sub-contract)
- Internal floor finishes
- Internal suspended ceilings and other ceiling finishes
- All integrated, non-integrated, illuminated and non-illuminated signage and other information display systems
- External paving and landscaping
- Stormwater drainage
- Smoke Extraction Requirements

1.4 Other Items

- Engineering calculations, drawings, materials simple together with tender submission.
- Engineering calculations with A3 & A2 & A1 size drawings for all structural components of the façade and roof must be reviewed and endorsed by the Architect. Review and endorsement by the Architect on such engineering calculations and structural component drawings shall not relieve the façade contractor's liability under this sub-contract.
- Samples, mock-ups and test units for visual mockup of the curtain wall, windows and cladding systems.
- All protective materials during transportation, installation, and prior to completion of the curtain wall and cladding systems shall be done by contractor and manufacturers.
- Method statement for installation of all systems during tender, and the first design shop drawing submission. Method statement shall outline any requirements for the use of any temporary or permanent gondolas and scaffolding requirements. The scaffold has to be provided by the Main

Contractors. Not high than 3m of scaffold shall be provided by contractor or some of location area has no common scaffold (solely for the work of the contractor) shall also be provided by contractor.

- Provision of staff responsible for keeping the Façade Contractor works area on site clean at all times, for keeping safety railing in place and access equipment in a safe condition at all times, for cleaning the curtain wall and the works described in this specification and for carrying out service and maintenance work during the Defects Liability Period.
- Programs for all activities which are consistent with the Main Contractors working schedule, and which comply with the overall program for this project.
- Co-ordination of all activities with the Main Contractor and all other Sub-contractors.

1.5 Drawings and Specification

- The Specification and the Tender drawings are for the purpose of defining the scope of the works, the design intent and performance requirements. The tender drawings do not claim to solve all movement or structural requirements, pressure equalization, waterproofing, air sealing, acoustic requirements, glass movement, seismic performance or thermal shock requirements. It is Facade Contractor's responsibility to develop and modify the detailed design to comply with all requirements in the Specification and other relevant standards and codes.
- The tender drawings are provided to show design intent and are not intended to show all conditions, components, materials, etc. The shop drawing, final detailing and appearance of components shall be subject to the architect's approval.
- Any discrepancies or contradictions in the drawings or specifications shall be brought to the attention of the Architect for clarification during the tender bid period by the tenderer.

1.6.1 Program, Calculations and Shop Drawing Schedule

Submit (in accordance with the Contracted/Main Contractor's programmed and within 2 weeks of the award of contract) the following items:

- Program of submissions for shop drawings & samples allowing a minimum of 15 working days for approvals. Shop drawing and calculation packages should be broken down in a logical manner that is easily manageable.
- Program of works.
- Schedule of materials to be used in the façade system together with a list of suppliers.
- Programmed are to be consistent with the Master programmed for this project, and shall be endorsed by the Owner and Architect.

1.6.2 Prototypes

Submit (within 15 days of the confirmation of prototype drawing) prototype installations as follows:

- Visual assessment prototype for wall type:
- Submit drawings of a prototype area for visual assessment of glass, different shapes of aluminum plate, in a location to be advised. Visual prototype scope shall include one full floors x 1 column module line wide and may include various

samples for architectural comparison of materials. The proposed prototype arrangement is to be submitted to the Architect for acceptance.

1.6.3 Product data

Submit (in accordance with the Contractee/Main Contractor's program and within 1 weeks of confirm shop drawing) all manufacturer's product specification and test data, manufacturer's quality assurance documentation.

Include product data for:

a) Metals and metal alloys, including welding materials.
b) Glass and glazing accessories.
c) Applied finishes, including preparation and pretreatment, application, curing, and maintenance procedures.
d) Sealants, gaskets and glazing accessories.
e) Insulation (thermal and fireproofing).
f) All proprietary accessory products, hardware and fixings.

1.6.4 Samples:

Submit (in accordance with the contractee/ Main Contractor's program and within 1 weeks of confirmation shop drawing) representative samples of products and materials, including finishes and representative factory-fabrications and site-installed assemblies.

2 sets of all samples are to be submitted, one set is to be submitted to the Architect and the Facade Consultant and the other is to be sent to the Main Contractor on site.

Include samples as follows

- Metal types and finishes, including proposed finished shapes, sections and extrusions. Provide metallurgical analysis certificates for alloy and temper of metal components.
- Glass types and finishes indicating color, surface pattern or texture, finish, surface coatings, and the range of variation, if any.
- Color samples of prefinished production material showing the limits of the range of variation in the selected color.
- Check samples to confirm or match Architect's sample.
- Color samples for all sealants, gaskets, and accessories.
- Joint system components, including sealant, structural adhesive.
- Typical fabrications and assemblies, showing welds and grinding, screwed and bolted junctions, fastenings and workmanship.
- Architect shall be allowed to ask for and receive any additional samples as he deems necessary.
- All samples shall be accompanied by additional descriptive information, including: brand, fabrication place, finish, application and certifications.
- All glass performance data sheet.

1.6.5 Shop drawings:

The Contractor shall submit the required design documents according to the terms of the contract.

- Time required for approval of shop drawings will be a maximum of 7 working days for each submission, including re-submissions.

- All revisions will be noted on the drawings. The revised areas shall be bubbled and the revision version indicated.
- The façade contractor should revise and resubmit the shop drawing reviewed by Architect and consultant with a cooperative attitude so that the shop drawing can be finished and approved within acceptable period time. The façade contractor shall be responsible for any extra payment requested by architect and consultant for excessive round of design review and checking.
- Do not commence manufacture until approval to use the relevant shop drawings has been obtained. Include and indicate:
- A cover sheet containing an index of drawings
- Notation index of all materials including alloy, thickness, finish, coating, size, hardness, brand, product name, tempering etc.
- Setout of all work, including reference points, edge conditions and joint pattern, indicated on plans, elevations and sections as applicable.
- Full size sections of all members, including descriptions of structural properties and specifications of materials. This includes a full schedule of section profiles.
- All drawings to be cross-referenced both forward and backward in logical markings
- Overall building elevations, geometry set out drawings, and key plans.
- Complete wall elevations and building sections at scale (1:100 or bigger), showing all relevant geometric information and a fully color-coded elevations to confirm the various paint colors.
- Typical unit or area elevations at scale (1:20 or bigger) both exterior and interior.
- Full size elevations of all intersections and joints.
- Provide any additional drawings, detail, etc. as may be requested by the Architect and Façade consultant.
- Shop drawing must show interface and coordination with all surrounding construction and systems.
- Methods of meeting performance criteria for thermal insulation, fire resistance, sound transmission and the like.

1.6.6 As-built documentation

Prepare as-built drawings, photographs and other records progressively as the work proceeds. Submit complete as-built documentation within 15 days of the completion of work.

1.7 Delivery, Handling and Storage

1.7.1 Generally

- All materials shall be packaged in accordance with relevant PRC codes and regulations and palleted for safe and convenient handling by fork-lift vehicles and Main-Contractor's hoisting equipment being available on the Site.
- All components of the façade shall be clearly marked after fabrication indicating their source and the location on the building as shown on the drawings.
- Provide a complete numbering system and schedule for all cladding and glazing panel units. Each panel shall be individually numbered in such a way that the manufactured history can be traced. Provide an approved permanent concealed marking system. Submit details.
- The Curtain Wall contractor shall be responsible for disposing of all packing materials. This is to be done in accordance with the clients requirements.

1.7.2 Glass

- Glass must be protected from any possibility of water/condensation damage during shipping/storage.

1.8 Project Conditions

1.8.1 Survey and setout

- Façade contractor shall survey and sign off on the existing conditions prior to wall installation. Take into consideration the effect of ongoing base building movements on curtain wall system and cladding system set out.

1.9 Fabrication tolerances

The fabrication tolerances of curtain wall should meet with the following requirements:

- Tolerances at joints and junction details shall take precedence over tolerances of panels and major components. Tolerances generally shall be:
- Joint width: +/- 1 mm.
- Length and width of major components: +/- 0.5 mm.
- Diagonals of major components: +/- 1 mm.
- Misalignment of mating surfaces: +/- 0.5 mm.

1.9.1 Service life

The service life of the facade shall be not less than 25 years.

1.9.2 Connection Requirements

a. Fixing requirements generally:

- All fixing brackets and anchorages shall be scheduled and described in detail on shop drawings.

b. Base building substrates

Provide contingency design and installation procedures for all typical substrate conditions and deficiencies including:

- Reinforcement clash
- Excessive out-of-tolerance concrete
- Honeycombing or other concrete defects
- Clash with concrete joints, and other structural details
- Mislocated, missed and incorrect embedment's

1.9.3 Environmental Requirements

a. **Generally**

- Design and warrant the wall be watertight weatherproof and have the required acoustic performance as required by the Acoustic Consultant.
- Provide for all weather and rainfall conditions. Submit full details on shop drawings including all assumptions.

b. **Weatherproofing**

- Sealants and gaskets which are inaccessible in the installed system shall remain effective for the service life of the system.
- Provisions shall be made to drain to the exterior face of the work any water entering the system joints, at glazing, panels, and from condensation. Drainage to the exterior shall be provided at every floor.
- The water tightness of all type of façade and window should meet with the requirement of Grade.
- No water leakage is allowed for a pressure difference less than 750 Pa no matter in the case of fixed part or in the case of operable part.

c. **Air infiltration requirements**

- In addition to the requirements for a drained joint system, the design and installation of the air sealing shall be carried out to high standards to minimize air infiltration. Coordinate with installers for adjacent work to achieve the specified maximum air infiltration at junction with curtain wall system.

d. **Thermal properties**

- The insulation and vapor barrier shall be sealed to the frame to prevent condensation in the cavity between the insulation and the glass. The insulated panel shall not affect the appearance of the glazing between vision and spandrel areas. Face the need to maintain continuity of insulation
- All curtain wall and cladding systems should comprise reliable condensation proof measures. No interior surface, including glass and frame, is allowed to have condensation under required environment condition.

e. **Weathering**

- The system and its components shall not fail to comply with performance requirements due to the effects of weathering.

f. **Acoustic Performance**

- The acoustic performance of the façade is to provide a sound attenuation rating as per ACCOR standard (attached)
- The system shall not generate noise due to the following: wind whistling, movement, creaking, drumming or rattling.

g. **Fire Proofing**

- Façade contractor shall install 2 hour rated fire stop and smoke seal between the slab edge and curtain wall.

1.9.4 Visual Requirements

a. **Profiles:**

- Design curtain wall and cladding system components so that sizes, profiles, dimensions and architectural style are as close as possible to those indicated on the Drawings. Indicate any variations on the shop drawings. Do

not commence production of extruded aluminum sections until all profiles have been approved.

b. **Applied finishes**

- The design of the components, selection and application of finishes, and installation procedures shall ensure a high standard of applied finish protection during construction. Develop and implement procedures to eliminate scratches, marks and blemishes to finished surfaces. Indicate procedures on shop drawings.

c. **Flatness and alignment**

- The design of the components, fabrication and installation procedures shall ensure a high standard of flatness, joint and edge straightness, and alignment of mating surfaces of joinery. Close attention shall be given to cutting and cut edge treatment procedures, stiffening and the tightening of fixings and fastenings which may cause distortion or warping.
- Panels and formed sheet material shapes are to be free of oil canning, warping, bowing, deformations, pinches, stress marks, etc. Read-throughs for welded connections, including studs, are not allowed.
- The flatness of panels and formed sheet material shapes are to subject to final visual assessment and approval of Architect and the client, not only to comply with the numeral requirements of code and standard

1.10 Assembly Factory Requirements

a) Must provide full overhead cover for all storage and assembly works. No panels shall be stored outdoors.
b) Must have air-conditioned climate controlled and dust-controlled environment for structural glazing.
c) Must be well lite and ventilated. If insufficient lighting or ventilation factory will be rejected.
d) Must be kept clean at all times. Materials and panels must be properly stored on approved storage racks.
e) Must have a well laid out assembly line that can accommodate vertical glazing of insulated glass units.
f) Each assembly is required to be supervised by senior technical manager at all times. Factory worker is required to have minimum 1 year experience for curtain wall assembly. Task role for each work shall be repetitive.

2.0 PRODUCTS

Glass and Glazing

a. Generally:

- Provide approved glazing systems, glass and glazing accessories which comply with all performance requirements. Submit details.
- The glass is to be protected during assembly, transportation, installation and on the finished building. Care should to taken to ensure that protection of glass panels will not result in staining or corrosion.

b. Thickness:

- Determine the glass thicknesses in accordance with relevant Standards, functional requirements including design wind loads, deflections and safety, and manufacturer's recommendations. Submit computations.
- Glass types and thicknesses shall be not less than indicated in the attached: Glass Schedule.

c. **Replacement of glass**

- All glass unit and connection details should be designed to make possible replacement of each glass unit.

d. Glazing

- Installation of each glass component shall be watertight and airtight and withstand all required temperature changes and wind loading without failure, including loss or breakage of glass, failure of sealants or gaskets, deterioration of glazing materials and other defects.
- Install glass with correct edge distances at all rebates. Protect glass from edge work damage during handling and installation.
- Surfaces to receive glazing materials shall be free of dirt, dust, grease, oil and other foreign materials.
- Perform required cutting, holing, obscuring and other required processes on glass. Finish exposed glass edges to a finish not inferior to ground

2.1.1 **Primary Glass**

a. **Generally:**

- All glass shall be free from cracks, scratches, bubbles, blisters, all inclusions of deleterious matter including nickel sulphide and other defects which detract from appearance or interfere with performance.

- All glass shall have clean, wheel cut edges with minimum feather, free from vents, notches, or shells.

2.1.2 **Tempered Glass**

a. Provide approved Fully Tempered glass, manufactured using the "roller hearth".

b. Edge quality:

- All tempered glass shall have belt arrised edges or better.
- Do not cut, work, or permanently mark after toughening. Use installation methods which prevent the glass making direct contact with metals or other non-resilient materials.

c. Warranty

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- All tempered glass in single pane applications shall be warranted for the warranty period.

2.1.3 Laminated Glass

a. Generally:
Provide all required laminated glass in accordance with specification

b. Interlayer:
Provide an approved polyvinyl butyral PVB/SGP interlayer. Submit details.

c. Warranty
All laminated glass in single pane applications shall be warranted for the warranty period.

d. Edge quality:
All laminated glass shall have belt arise or better edges as required to eliminate thermal stress breakage risk.

e. Installation:
Use glazing materials which do not cause deterioration or discoloration of the interlayer.

2.1.4 Visual Effects and Coatings

a. Generally:
Provide approved coatings, and visual effects of paint or film to glass to match approved samples. Submit details.

Colour, reflectivity and appearance shall be uniform for each glazing type. Defects, including scratches and pin-holes shall not be visible when viewed at a distance of 3 m. Provide safety backing restraint for fallout resistance.

Low-e and reflective coatings can only be supplied by processors with more than 10-year experience in related coating.

2.1.5 Glazing Accessories, Gaskets, Weather Seal

a. Generally

- Provide approved non-cellular elastomeric extruded profiles, including gaskets, seals and glazing accessories, required for a complete installation. Submit details, including compatibility with adjacent components and sealants.
- Glazing accessories, including spacers, setting blocks, wedges, and the like, shall comply with specification and the recommendations of the glass manufacturer or glazing system.
- Extruded profiles shall be smooth, of uniform dimensions, correctly selected for the conditions of use, and free from components likely to

bleed, stain or detrimentally affect performance of the glazing. All products shall be of ultra-violet and ozone resistant grade.

- Products may be manufactured from EPDM (ethylene-propylene-diene monomer) or "Neoprene".
- Provide factory vulcanization for EPDM products at joints and corners.

b. Profiles

- Where indicated on the Drawings or required, provide dense profiles including flashings, wiper seals.
- Gasket profiles used for glass capture shall produce a glass edge pressure not less than 0.8 N/mm or more than 1.5 N/mm.
- Gaskets, which maintain glass face clearance while serving as a backer for a silicone weather seal may have a friction fit. All other gaskets and weather strips, including backers for structural silicone, shall have a continuous spine or a continuous groove, which engages a matching groove or leg on the aluminum frame.

c. Double sided tape

- Use China made or approved equal double-sided tape/baker rod as glass space for structural silicone applications. Submit compatibility test results supplied by manufacturer.

d. Contact with structural silicone sealants:

- Extruded profiles in contact with structural silicone sealants shall be approved black heat cured silicone rubber. Submit details.

2.1.6 Structural Glazing

a. Generally

- Design and provide structural sealant glazing systems where indicated on the Drawings, or otherwise if approved in writing.

- All glazing and sealants shall comply with manufacturer's recommendations, relevant Standards, and approved shop drawings.

b. Structural glazing requirements

- Structural glazing adhesive contact surfaces shall be anodized or other coated which is tested compatible with the structure sealant. Raw milled aluminum surface is not allowed for structural sealant glazing.

c. Structural Sealant Design:

1. The structural glazing adhesive has been satisfactorily tested for compatibility with the adjacent materials and components, is not detrimental to its long term structural performance, weathering and visual quality, is compatible

with the edge seal of IGUs, and will not cause delamination or other impairment to laminated glass.

2. Calculations, are required for the following:

- Limits the working stress of sealants to 138 kPa, and the working stress of pressure sensitive tapes to 230kPa.
- Limits the working stress of sealants to 5x the working load.
- Provides for thermal movement between abutting glass edges by an adequate "working joint" design with the necessary clearances and dimensions.
- The dead load of the glass shall be fully supported by the setting blocks in the installed position, and fully engaged with the setting blocks prior to the application of structural adhesive.

d. Site glazing

- Structural glazing shall be carried out in the factory except for approved on-site glass replacement.
- Approval will not be given for structural site glazing unless: Independent support of the glass is provided until the structural adhesive has fully cured.

2.2 Aluminium

a. Generally

- Provide approved aluminium extrusions and/or sheet of alloy and grades suitable for the structural requirements, applied finishes and project conditions not less than the strength and durability properties of the alloy and temper designated in the relevant Standards.
- Manufacturers shall be approved established manufacturers with a reputation for producing high quality materials. Submit full details of manufacturers for approval.

b. Quality and certification

- Submit manufacturer's certificate of compliance or test report for each batch of aluminium supplied. Each batch shall be suitably identified and cross-referenced with the certificate.
- Quality control measures shall ensure that materials are inspected before shipment. Material that has not been tested, has not been processed in accordance with the Specification, or does not satisfy visual requirements shall not be shipped.

c. Extrusions:

- Extrusion shapes and thickness shall withstand all required loads, and shall be rigid with straight and sharply defined profiles, free of draw marks. Structural sections minimum wall thickness should meet national

standards and regulatory requirements, and to meet production requirements.

The tolerance of all extruded aluminum profiles shall reach High Accuracy Class or Super Accuracy Class.

d. Sheet thickness for external cladding

- Unless otherwise indicated on the Drawings, thickness of sheet aluminium for external cladding shall be not less than as per BoQ / + tolerance and shall be tension leveled (stretcher level).
- Composite sheet products shall not be substituted for aluminium sheet unless approved in writing by Architect. Sheet thicknesses at coping panels and all conditions subject to lighting strikes/protection to be thickened.

2.2.1 Aluminium Fabrication

a. Generally:
- All extruded material is to be produced by an Architect Approved Extruder. Fabricate aluminium in accordance with approved shop drawings and prototypes.
- Cut edges, drilled holes, riveted joints and flat sheets shall be clean, neat, free from burrs and indentations. Remove sharp edges without creating excessive radius.

b. Joints and junctions:
- All visible joints shall be fixed by concealed means, unless otherwise indicated on the drawings or approved in writing.
- Fit exposed joints accurately to provide close continuous contact to a fine hairline. Ensure continuity of finish, color and texture without surface variations at joints.
- Where required, joints shall be watertight and weather tight.
- Other than for concealed stud welding, aluminium extrusions shall not be welded except where approved and writing, and, if approved, only on concealed surfaces. Read-through on welding is not allowed.

c. Fixings in aluminium work:
- Fastener requirements listed are applicable to screws, bolts, washers, nuts, and pins. (All fasteners should be nonmagnetic stainless steel type 316.)
- All self-drilling/self tapping fasteners ('Teks') shall be 'Dril-flex' with Stalgard finish, manufactured by approved brand. Cadmium-plated steel or aluminium fixings shall not be used.

d. Welded studs
- Where required for fixing face sheeting to support frames, provide not less than M6 fully threaded welded studs of approved type, and welded by approved procedures. Submit complete details including samples, and pull-out test results. Include preliminary and ongoing production test results.

- A testing program shall include an initial proof testing procedure of not less than 100 examples of each type of fixing, and subsequent testing of not less than 10 examples progressive through the fabrication program at monthly intervals.
- Approval of fixings shall require that the average of each set of 6 test failure loads be not less than 2x the design load, and absence of permanent deformation at 1.5x the design load.

e. Holes

- Provide holes and connections for site assembly and to accommodate work of others as required. Holes shall be drilled, or punched and reamed, perpendicular to the surface.

f. Built-up members and reinforcement

- Steel reinforcement of aluminium members shall be completely enclosed and separated from aluminium by approved methods. Submit details.

g. Moving parts

- Moving parts shall operate freely and smoothly, without binding or sticking, at correct tensions or operating forces, lubricated where appropriate.

h. Protection

- Protect finished aluminium surfaces to prevent damage during transportation, storage, installation, and until the client approves its removal.
- Provide factory applied protective film, tape or coatings which will not bond to the aluminium surfaces when exposed to sunlight or weather.

2.2.2 Aluminium Welding

a. Generally

Welding of aluminum will not normally be permitted. Where it is required, it will be carried out subject to the following:

- Approved Welding Procedures
- By Approved welders with relevant Certificates for this work.
- At locations nominated and approved on shop drawings
- Not near finished surfaces or glass
- Strength test of 5% of samples
- Approval from the Architect

2.2.3 Aluminium Clad Panels

- All Aluminium panels are to be properly designed with extruded Aluminium stiffeners both horizontal and vertical on back of panels. Edge stiffening may also be required. Stiffeners shall be attached by both stud method and structural silicone.

- Where aluminum clad panel form part of the sealed curtain wall system, they shall be insulated in the same manner as the spandrel glass.
- All aluminum panels within 3 meters of the ground, or any walking surface, shall have concealed sound dampening applied.

2.2.4 Aluminium Louvres

a. Operable Louvres
- Operable louvres are to be waterproof and weatherproof and self-draining.

b. Architectural Louvres
- Architectural louvres are may/may not be require to be weatherproof, but the cavity between them and any operable louvre is to be fully flashed with a stainless-steel flashing to drains.
- Exterior louvers are to be storm proof. All louvers to be extruded aluminum frames and blade painted per architect's requirements. Frame corners and blade ends shall be fastened with 316 grade stainless steel screws.
- Provide concealed stiffeners for blades, such that vector sum of blade deflection parallel to principal axes does not exceed L/175 times span at design pressure assume that pressure acts perpendicular to the plane formed by the corners of the perimeter frame, and that the tributary area for one blade equals its projected area on the same plane.
- Continuous louver blades to be locked and fastened to vertical support members, heads and sills shall have an integral sealant reveal. Provide base catch fan and flashings to shed all water.

c. Insect wire-mesh
- Provide approved concealed stainless-steel grade 316 insect wire mesh to the interior of all external louvre assemblies, except false louvres backed by walls or baffles. Mesh opening shall not exceed 3 mm and shall be 1.6mm minimum thickness. Mesh shall be painted flat black or color otherwise specified by Architect.

d. Installation and removal
- Louvres to plant rooms shall be designed to be removed and re-installed if required, for the removal / replacement of major plant items.

2.3 Joints and Junctions

2.3.1 Sealant Materials

a. Generally:
- Sealant type and installation method shall be in accordance with manufacturer's recommendations suitable to the location, function, substrates and performance requirements including movement, air infiltration, fire and acoustic requirements. Submit complete details, specifications, installation and curing instructions, including manufacturer's certification that the proposed product selections are

suitable for the joint types and are compatible with and no staining, and non-bleeding to adjacent materials.

b. Movement requirements:
- Where sealants are used to seal movement joints, movement capability of sealant shall be appropriate to expected maximum deflection or movement.
- Unless otherwise approved, sealant depth for movement joints shall not exceed half the joint width.

c. Fire rated requirements:
- Provide approved fire-rated sealant and joint fillers where indicated or required.
- Where dry foam fire rated fillers are proposed for wall types which also have acoustic or air infiltration requirements, provide an elastomeric cover bead.

d. Compatibility
- All proposed sealants and accessories shall be compatible with substrates, adjacent materials, accessories and other sealants, and shall be non-staining and non-bleeding.

e. Colored sealants:
- Provide colored or paintable sealants where required in accordance with approved samples. Sealants shall be resistant to staining due to dirt or pollution, and shall be capable of cleaning. Sealants to be custom and standard colored as selected by architect, multiple types-provide list.

f. Sealant accessories:
- Provide all required accessories recommended by sealant manufacturer, including backing rods, bond breaker tape and the like. Submit details.

g. Manufacturer's standard test data:

- Submit manufacturer's standard test reports and certificates previously performed on proposed sealants, including details of the following characteristics:

  · Chemical composition
  · Adhesion, bond strength, cohesion or tensile strength, and elongation
  · Compatibility
  · Hardness and viscosity
  · Color stability
  · Compression set
  · Low-temperature flexibility
  · Modulus of elasticity
  · Water absorption
  · Effects of exposure to ozone and ultraviolet light
  · Stain resistance

h. Warranty:

- All sealants shall be warranted for the warranty period. The expired product is not acceptable to use.

2.3.2 Sealant Installation

a. Generally:

- All sealants shall be installed in accordance with manufacturer's recommendations.

b. Cleaning:

- Clean the joint surfaces immediately before installation of backing rod and again before applying the sealant, as recommended by sealant manufacturer.

1. Glass and Aluminium:

- Cleaning compounds shall be applied with clean lint-free cloths. A two-wipe method of application shall be employed. First wipe with an acceptable cleaning-grade solvent onto the cloth to remove contaminate and then immediately wipe the cleaned area with a separate clean, dry cloth.

2. Porous substrates, concrete, masonry:

- Clean where necessary by grinding, mechanical abrasion, detergent washing or a combination of methods to ensure a clean sound interface in accordance with the manufacturer's recommendations.

c. Priming, etching and sealing:

- Prime or seal joint surfaces where recommended by sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

d. Installation of sealant accessories

- Install backer rod for sealants, at a proper depth to provide sealant bead profiles indicated on approved shop drawings.
- Install bond breaker tape where indicated and where required by the manufacturer's recommendations to ensure the proper performance of sealants.

e. Proof of supply shelf life:

- Ensure that remaining shelf life of products is well within the likely installation period. Confirm expiration dates with manufacturer.

f. Curing

- Provide for the appropriate cure conditions, in accordance with the sealant manufacturer's written recommendations at factory and on-site. Protect external sealants from inclement weather until fully cured. Glazed panels

are not to be moved until the joint has developed sufficient bond strength and cohesive integrity.

2.3.3 Vapor retarder layer

- All rock wool or fiber glass insulation should be isolated from indoors warm and humid air using reinforced composite PVC, PE or aluminium film vapor retarder film to avoid condensation. The vapor permeance rate of film must be less than 0.05. The material should also comply with following requirements:

2.4 Fixings and Anchors

a. Generally:

- Submit details, including computations and shop drawings where required, indicating type, size and spacing of all items.
- Co-ordinate with others if required to ensure anchorages are provided and accurately built-into base-structure without delay or disruption. Provide setout drawings, templates and installation instructions as required.
- Ensure that all bolts and similar fixings are tight at the completion of installation.

b. Minimum Level of Protection

- All bolts, nuts, washers in any given assembly shall be of the same material and grade.
- Bolts between galvanized steel components shall be galvanized.
- Bolts between aluminium and steel shall be stainless steel and fully insulated.
- Bolts between aluminium and stainless steel shall be stainless steel.
- Bolts between steel and stainless steel shall be stainless steel and fully insulated.
- Bolts between aluminium components shall be stainless steel.

c. Locking of nuts and threads.

- Apply an approved nut locking compound or device to all nuts.

2.4.1 Anchorages

a. Expansion or Chemical Anchors:

- Provide approved proprietary anchorages, with corrosion-resistant finish, suitable for the substrates and conditions, with holding power at least 5 x design load.
- Do not use explosive shot fired devices unless approved in writing before commencing installation.
- Chemical anchors are not to be used where a fire-resistant fixing is required.

b. Channel anchorages:

- Provide approved channel anchorages in hot-dip galvanized steel or Grade 304 stainless steel where required, complete with polystyrene insets and plastic end caps.
- Channel length, tail size and tail locations shall satisfy the most extreme loading conditions allowed for in the structural calculations.

2.4.2 Fixings

a. Fasteners

- Fastener requirements listed are applicable to screws, bolts, washers, nuts, rivets, and pins. (All fasteners should be nonmagnetic stainless-steel type 316.)

b. Bolts (As specified)

- Galvanized: High Strength Grade 8.8
- Stainless steel: Bolts Exterior-Grade A4
- Bolts interior-Grade A2

c. Cast-in Plates (As specified)

- Cast-in plates are to be Grade Q235B with welded studs or mild steel reinforcement welded to the plates in accordance with the Engineer's drawings. Cast-in plates are to be hot dip galvanized after all the fitments have been attached.

2.5 Window Hardware and Door Ironmongery

a. Operable Vents

- All window hardware is to be of a proprietary type stainless steel, grade 304 or 316, which has been fully designed and tested. Load capacity tables provided by the Supplier are to be submitted, together with test results, if required. The profile of the handle shall be designed in association with the Architect to ensure its operability in terms of depth and access for recoverability of the vent when it is in open position. Options for profiles shall be provided for the architect's selection. All visible hardware to be finished to match window frame and sash.
- All operable sash/vents to be weather proof with 2 rows of gaskets. Gaskets shall be heat vulcanization at corners.
- The force to open and close the vent cannot be greater than 50N. And all vents shall have a service life not less than 100,000 cycles of operation. Submit detailed testing report to testify the performance of vents.

b. Locking System

- Locking System for operable vents shall be Architect Approved. Handle shall be located at midpoint of operable vent on the vertical face. The handle in the open position should not obstruct the action of the outward opening vent.

- Locking Points shall be calculated based on acceptable vent defection and stress limits. The design strength of single lock point shall not be greater than 800N unless other wisely approved.
- The locking system shall be fully concealed within the body of the vent frame and shall lock into a concealed location.

c. Openable Doors& Hinges

- Door hinges shall be concealed spring hinges (ground spring) or Architect approved.
- Door locks and handles shall be Architect approved. Locking mechanisms shall be Architect approved and shall be based on a Master-Keying System.
- All hardware shall be Grade 304 or 316 Stainless Steel and Architect specified finish.

2.6 Gutters (As specified)

- Provide gutter system which is seamless integrated with façade and skylight. Demolish any cold bridge and water leakage weakness.
- The gutter should be made of grade SUS316 stainless steel sheet with minimum thickness 2.0mm. Carbon steel or GMS is not allowed for gutter surface. The stainless-steel sheet should have directional hairline finish.
- All end lapping must seal reliably. The support frame of gutter must sustain the system with full water. Provide fire rated and corrosion proof flexible isolation block for gutter.
- The thermal and acoustic performance should be in consistence with other system.
- The Contractor is responsible for the holing and seal of downspouts.
- The gutter must not leak during the service life of the roof.
- For concealed gutters covered by external claddings, the cladding panels should be designed to be removable and replicable at downspouts locations for maintenance purpose.

2.7 Other Components

2.7.1 Internal Trims to Curtain Wall

- Internal trims are to be provided to sills, jambs and ceiling transoms at all floors. These trims are to provide a uniform surface, with hairline joints. Sill trims to be reinforced to prevent damage from being stood on. The space for pelmet shall be involved in consideration.

2.7.2 Fire Stops

- The continuous gap between the curtain wall insulation and the concrete slab edge is to be filled with 2-hour fire resistant period. Use insulation with minimum nominal density of 60kg/m3 for which minimum thickness to be 135mm from top to bottom or 100mm for 80kg/m3.

2.7.3 Smoke Seals

- Provide 1.5mm or thicker sealed zinc aluminium or galvanized steel sheet as a continuous smoke seal between the slab edge and the curtain wall at each slab level. Use fire rated sealant to seal all joints.

2.7.4 Backpans

- All backpans are to be aluminum sheet fully sealed to form a drained spandrel cavity. Front sheet to be 2.0mm thick aluminum sheet/4.0mm aluminum composite panel, rear sheet to be 1.5mm thick galvanized steel sheet and reliably isolated from aluminum frame, see drawings for detail.

2.7.5 Thermal Insulation

- All thermal insulation shall be high quality rock wool board or fiber glass board, which should comply with following requirements:

Specification:
Density ： Rock wool 80kg/m3
Thermal conductivity coefficient：λ≤0.04 W/m.K

Shot content：≤5%

Fibre diameter：≤7um

Water absorption ratio：≤1%

Water-repellent ratio：≥98%

Combustibility

A hot contract temperature：≥600°C

Class A fire rating

All fire rated insulation to have mechanical fasteners.

2.7.6 Sign Boxes

- Façade contractor shall coordinate with signage manufacturer for all signage anchoring and penetration requirements. Curtain wall contractor is responsible for fully sealing all penetrations. The sign boxes shall be fitted with a hinged tempered glass cover that allow the inside and outside of the glass to be cleaned and the lights to be replaced.

3.0 STEELWORK FOR facade

3.1 Welding

a. Welding Consumables

- All welding of structural steel shall comply specification standard. Welding consumables used in metal arc welding of austenitic stainless steel shall comply with specification.
- Welding consumables and the procedures used shall ensure that the mechanical properties of the deposited weld metal shall not be less than the parent metals.

b. Preparation for welding

- Prepare fusion surfaces: Surfaces must be dry. Warm the surfaces if required to remove condensation.
- Remove welding slag by chipping before depositing subsequent runs.

c. Tack welds

- Tack welding may only be used with express approval. Tack welds to be minimum 50mm long.

d. Butt welds

- Butt welds shall be full penetration welds between prepared fusion faces, unless otherwise specified. Carry out back chipping, grinding or gouging of the deposited weld as required to obviate imperfections in the root run. Grind butt welds flush without loss of parent metal.

e. Fillet welds

- Deposit fillet welds to the required length, throat thickness and with partial or full penetration as specified.

f. Temporary attachment

- Do not weld temporary attachments to principal joints. Obtain approval of the position of welds for temporary attachments.

3.2 Test Certificates

- The Façade Contractor shall submit Test Certificates for all steel plates, sections, connections and welding consumables to the Architect for approval before fabrication begins. Fabrication shall not commence until the Test Certificates are verified by the Architect in writing.

3.3 MATERIAL TESTING

- Test certificates shall be provided for all steelwork.

3.4 Weld Testing

- Provide an experienced and competent operator to supervise welding.
- Keep a record on Site when specified to identify welders responsible for major welds.
- Obtain approval of the proposed welding procedures prior to commencing welding including:
- Preparation of fusion faces
- Preheating temperature where required.
- Type of electrodes.
- Number and sequence of runs to build-up the weld bead.
- post-heating treatment if required.
- Do not depart from the agreed welding procedure without the prior agreement of the Engineer.

- Strictly follow the procedures of welding established in the successful approval test for the works.

3.5 Protective Coatings

- All steelwork is to be provided with a protective coating system with a 15 years minimum design life. The coatings are to be provided over the full surface area of steelwork. Exposed edges and site weld areas are to be coated with an approved coating system for site applications.
- Protective coatings are to be as outlined below for normal internal and external applications. For more aggressive environments, higher performance paint systems are to be used.

3.5.1 Internal Concealed Steelwork

- Internal concealed steelwork is to be Hot Dip Galvanized with a minimum dry film thickness of 70 microns. Steel sheet should be double side continuous hot dip galvanized, with a minimum coat grade Z275.

3.5.2 Internal Exposed Steelwork

- The coating system is to be approved by the Architect suitable for internal surfaces and wear from impact and traffic as necessary.

3.5.3 External Concealed Steelwork

- External concealed steelwork is to be Hot Dip Galvanized with a minimum dry film thickness of 100 microns.

3.5.4 External Exposed Steelwork

- The coating system is to be by Architects Approved equivalent suitable for external surfaces and wear from UV, pollution (including acid rain), impact and traffic as necessary.

3.5.5 Hot Dip Galvanized Steelwork

a. Surface Preparation

- The steelwork is to be chemically descaled and cleaned, so that rust, mill scale, oil, grease and other foreign matter are removed immediately prior to galvanizing. Tubular sections are to have bleed holes as necessary.

b. Distortion due to Galvanising

- The contractor is to ensure the steelwork does not distort as a result of galvanizing. The size of components, preheating requirements, and dipping method are to be reviewed to achieve minimal distortion and maintain steelwork Tolerances.

c. Repair and touching up

All abrasions site welds etc are to be repaired by grinding (wire brushing) the surface back to a sound substrate and batch coating with Zinc Rich Epoxy Primer equivalent in quality of 110 micrometers dry film

3.6 Erection

a. Site Safety Considerations

- Safety requirements, erection cranes, equipment, scaffolding and staging, shall meet the requirements of relevant local building regulations.
- The Façade Contractor shall take full responsibility for the Safety and Stability of the steelwork during erection and until such time as it is finally completed and handed over, must take all precautions including temporary bracings necessary to ensure stability of the partially assembled structure against wind forces, and those stresses exerted due to erection equipment and its operation tending to distort or deform the framework.

b. Temporary Supports

- The Façade Contractor shall adopt an erection procedure such that all members can be placed and fixed in position without distortion
- The Façade Contractor shall allow for the cost of temporary erection bracing required and any professional advice required in connection with such bracing.
- As each section of steel is erected, all members shall be aligned, levelled and plumbed before final bolting up or welding commences. The ties, jacks' braces, etc, used in lining, levelling and plumbing the steelwork shall be left in position until all bolts have been finally tightened.

4.0 INSTALLATION

4.1 Curtain Wall Installation

a.General

- Install the cladding system in accordance with shop drawings and prototypes to comply with all performance requirements, Codes and Standards and the requirements of the relevant Statutory Authorities.
- Install the cladding system plumb, level and true to line within required tolerances, and suitably anchored to the base-structure.

b.Site modifications:

- Unauthorized site modifications, or work not in accordance with the approved shop drawings, may be required to be removed and replaced.

c.staged completion:

- Cladding shall be installed in an orderly sequence. Where practical, cladding shall be completed and closed off on a floor-by-floor basis.
- Provide temporary flashings at completion of each stage to waterproof and weatherproof the enclosed work. Remove temporary flashing before proceeding with subsequent work.

4.2 Protection

a. Progressive cleaning:

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- Clean the work area progressively remove debris, waste, excess materials and the like from the work area on a daily basis and maintain the works areas allocate for this contract clean at all times.

b. Final cleaning:
   - At completion of installation, clean the work area thoroughly and clean the finished work to remove all marks, soiling and the like.
   - Finished work shall be free from defects and mechanical imperfections such as scratches, scrapes, dents, and abrasion.

c. Adjacent work by others
   - At the completion of all adjacent work by others, including services work, attend the Site, inspect the work areas generally, and repair all damage, complete or make good finishing, trimming and sealing, and replace any damaged or dislodged work.

d. Commissioning:
   - At completion of installation, commission, test and adjust as required, all manual and mechanical operating components in all functional modes.

e. Architectural finishes
   - At completion of installation, wrap or cover architectural finishes to avoid soiling, damage, or wear and tear during subsequent building activities. Otherwise, clean and maintain finished work as frequently as necessary through-out remainder of construction period. Protection shall be designed for removal without damage to finished surfaces.

f. Glass
   - Remove and replace glass which is broken, cracked, abraded, chipped or damaged in other ways before or during installation.

g. Responsibility:

   - Be responsible for all breakage until installation is completed and handed over. The Contractor responsibility for any damage unless damage occurred as the result of incorrect or unsuitable materials or installation procedures.

SECTION-7: GENERAL CONDITIONS OF CONTRACT

A. General

1. Definitions

1.1 In the Conditions of Contract, which include Particular Conditions and these General Conditions, the following words and expressions shall have the meaning hereby assigned to them. Boldface type is used to identify the defined terms:

(a) **Adjudicator** is the expert appointed jointly by the Procuring Entity and the Contractor to resolve disputes in the first instance, as provided for in GCC Sub Clause 92.2.

(b) **Approving Authority** meansthe authority which, in accordance with the Delegation of Financial Powers, approves the award of contract.

(c) **Bill of Quantities (BOQ)** means the priced and completed Bill of Quantities forming part of the Contract defined in GCC Clause 59.

(d) **Compensation Events** are those defined in GCC Clause 67.

(e) **Competent Authority** means the authority that gives decision on specific issues as per delegation of administrative and/or financial powers.

(f) **Completion Certificate** means the Certificate issued by the Project Manager as evidence that the Contractor has executed the Works and physical services in all respects as per design, drawing, specifications and Conditions of Contract.

(g) **Completion Date** is the actual date of completion of the Works and physical services certified by the Project Manager, in accordance with GCC Clause 78.

(h) **Contract Agreement** means the Agreement entered into between the Procuring Entity and the Contractor, together with the Contract Documents referred to therein, including all attachments, appendices, and all documents incorporated by reference therein to execute, complete, and maintain the Works.

(i) **Contract Documents** means the documents listed in GCC Clause 6, including any amendments thereto.

(j) **Contractor** means the Person under contract with the Procuring Entity for the execution of Works under the Rules and the Act as stated in the **PCC**.

(k) **Contract Price** means the price payable to the Contractor as specified in the Contract Agreement, subject to such additions and adjustments thereto or deductions therefrom, for the execution, completion and maintenance of the Works in accordance with the provisions of the Contract.

(l) **Contractor's Tender** is the completed Tender Document including the priced BOQ and the Schedules submitted by the Contractor to the Procuring Entity.

(m) **Cost** means all expenditures reasonably incurred or to be incurred by the Contractor, whether on or off the Site, including overhead, taxes, duties, fees and such other similar levies including corresponding incidental charges and premiums for banking and insurances, as applicable.

(n) **Day** means calendar day unless otherwise specified as working days.

(o) **Day works** means work carried out following the instructions of the Procuring Entity or the authorised Team Leader, PMC and is paid for on the basis of time spent by the Contractor's workers and equipment at the rates specified in the Schedules, in addition to payments for associated Materials and Plant.

(p) **Defect** is any part of the Works not completed in accordance with the Contract.

(q) **Defects Correction Certificate** is the certificate issued by the Project Manager upon correction of defects by the Contractor.

(r) **Drawings** include calculations and other information provided in Section11 or as approved by the Project Manager for the execution and completion of the Contract.

(s) **Equipment** is the Contractor's apparatus, machinery, vehicles and other things required for the execution and completion of the Works and remedying any defects excluding Temporary Works and the Procuring Entity's Equipment (if any), Plant, Materials and any other things to form or forming part of the Permanent Works.

(t) **Force Majeure** means an event or situation beyond the control of the Contractor that is not foreseeable, is unavoidable, and its origins not due to negligence or lack of care on the part of the Contractor; such events may include, but not be limited to, acts of the Procuring Entity in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes or more as included in GCC Clause 83;

(u) **GCC** means the General Conditions of Contract.

(v) **Procuring Entity** means the Procuring Entity of the People's Republic of Bangladesh.

(w) **Goods** mean the Contractor's Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.

(x) **"Head of the Procuring Entity"** means the Secretary of a Ministry or a Division, the Head of a Procuring Entity Department or Directorate; or the Chief Executive, or as applicable, Divisional Commissioner, Deputy Commissioner, Zilla Judge; or by whatever designation called, of a local Procuring Entity agency, an autonomous or semi-autonomous body or a corporation, or a corporate body established under the Companies Act;

(y) **Intended Completion Date** is the date calculated from the Commencement Date as specified in the **PCC**, on which it is intended that the Contractor shall complete the Works and physical services as specified in the Contract and may be revised only by the Project Manager by issuing an extension of time or an acceleration order.

(z) **Materials** means things of all kinds other than Plant intended to form or forming part of the Permanent Works, including the supply-only materials, if any, as specified in the **PCC**

(aa) **Month** means calendar month.

(bb) **Original Contract Price** is the Contract Price stated in the Procuring Entity's Notification of Award (**Form PW3-7**) and further clearly determined in the **PCC**.

(cc) **Permanent works** means the permanent works to be executed by the Contractor under the Contract.

(dd) **PCC** means the Particular Conditions of Contract.

(ee) **Plant** means the apparatus, machinery and other equipment intended to form or forming part of the Permanent Works, including vehicles purchased for the Procuring Entity and relating to the construction of the Works and physical services.

(ff) **Procuring Entity** means a Procuring Entity having administrative and financial powers to undertake procurement of Works and physical services using public funds and is as named in the **PCC** who employs the Contractor to carry out the Works.

(gg) **Project Director** is the person named in the **PCC** or any other competent person appointed by the Procuring Entity and notified to the Contractor who is responsible for supervising the execution and completion of the Works and physical services and administering the Contract.

(hh) **Provisional Sums means** amounts of money specified by the Procuring Entity in the BOQ which shall be used, at its discretion for meeting other essential expenditures under the Contract pursuant to GCC Sub Clause 75.

(ii) **Retention Money** means the accumulated retention moneys which the Procuring Entity retains under GCC Clause 70.

(jj) **Schedules** means the document(s) entitled schedules, completed by the Contractor and submitted with the Tender Submission Letter, as included in the Contract. Such document may include the data, lists and schedules of rates and/or prices.

(kk) **Site** means the places where the Permanent Works are to be executed including storage and working areas and to which Plant and Materials are to be delivered, and any other places as may be specified in the **PCC** as forming part of the Site.

(ll) **Site Investigation Reports** are those that were included in the Tender Document and are factual and interpretative reports about the surface and subsurface conditions at the Site.

(mm) **Specification** means the Specification of the Works included in the Contract and any modifications or additions to the specifications made or approved by the Project Manager in accordance with the Contract.

(nn) **Start Date** is the date defined in the **PCC** and it is the last date when the Contractor shall commence execution of the Works under the Contract.

(oo) **Subcontractor** means a person or corporate body, who has a contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.

(pp) **Temporary Works** means all temporary works of every kind other than Contractor's Equipment required on the Site for the execution and completion of the Permanent Works and remedying of any defects.

(qq) **Variation** means any change to the Works directly procured from the original Contractor to cover increases or decreases in quantities, including the introduction of new work items (non-Tendered items) that are either due to change of plans, design or alignment to suit actual field conditions, within the general scope and physical boundaries of the contract.

(rr) **Works** means all works associated with the construction, reconstruction, site preparation, demolition, repair, maintenance or renovation of roads, highways, or a building, an infrastructure or structure or an installation or any construction work relating to excavation, installation of equipment and materials, decoration, as well as physical services ancillary to works as detailed in the **PCC**, if the value of those services does not exceed that of the Works themselves.

Writing means communication written by hand or machine duly signed and includes properly authenticated messages by facsimile or electronic mail.

2. Interpretation

2.1 In interpreting the GCC, singular also means plural, male also means female or neuter, and the other way around. Headings in the GCC shall not be deemed part thereof or be taken into consideration in the interpretation or construance of the Contract. Words have their normal meaning under the language of the Contract unless specifically defined.

2.2 Entire Agreement

The Contract constitutes the entire agreement between the Procuring Entity and the Contractor and supersedes all communications, negotiations and agreements (whether written or verbal) of parties with respect thereto made prior to the date of Contract Agreement; except those stated under GCC Sub Clause 6.1(j).

2.3 Non-waiver

(a) Subject to GCC Sub Clause 2.3(b), no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, neither shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

(b) Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, dated, and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

2.4 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

2.5 Sectional completion

If sectional completion is specified in the **PCC**, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any section of the Works (other than references to the

Completion Date and Intended Completion Date for the whole of the Works).

3. Communications & Notices

3.1 Communications between Parties (notice, request or consent required or permitted to be given or made by one party to the other) pursuant to the Contract shall be in writing to the addresses specified in the **PCC**.

3.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

3.3 A Party may change its address for notice hereunder by giving the other Party notice of such change to the address.

4. Governing Law

4.1 The Contract shall be governed by and interpreted in accordance with the laws of the People's Republic of Bangladesh.

5. Governing Language

5.1 The Contract shall be written in English. All correspondences and documents relating to the Contract may be written in English. Supporting documents and printed literature that are part of the Contract may be in another language, provided they are accompanied by an accurate translation of the relevant passages in English, in which case, for purposes of interpretation of the Contract, such translation shall govern.

5.2 The Contractor shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.

6. Documents Forming the Contract and Priority of Documents

6.1 The following documents forming the Contract shall be interpreted in the following order of priority:

(a) the signed Contract Agreement (**Form PW3-9**);
(b) the Notification of Award (**PW3-8**);
(c) the completed Tender and the Appendix to the Tender;
(d) the Particular Conditions of Contract;
(e) the General Conditions of Contract;
(f) the Technical Specifications;
(g) the General Specifications;
(h) the Drawings;
(i) the priced BOQ and the Schedules; and
(j) any other document listed in the **PCC** forming part of the Contract.

7. Scope of Works

7.1 The Works to be executed, completed and maintained shall be as specified in the BOQ, the General and Particular Specifications and Drawings.

7.2 Unless otherwise stipulated in the Contract, the Works shall include all such items not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for completion of the Works as if such items were expressly mentioned in the Contract.

8. Assignment

8.1 Neither the Contractor nor the Procuring Entity shall assign, in whole or in part, its obligations under the Contract.

9. Eligibility

9.1 The Contractor and its Subcontractor(s) shall have the nationality of a country other than that specified in the **PCC**.

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9.2 All materials, equipment, plant, and supplies used by the Contractor in both permanent and temporary works and services supplied under the Contract shall have their origin in the countries except any specified in the **PCC**.

10. Gratuities / Agency fees

10.1 No fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the Tender or in the Contract, have been given or received in connection with the procurement process or in the Contract execution.

11. Confidential Details

11.1 The Contractor's and the Procuring Entity's personnel shall disclose all such confidential and other information as may be reasonably required in order to verify the Contractor's compliance with the Contract and allow its proper implementation.

11.2 Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.

12. Joint Venture (JV)

12.1 If the Contractor is a JV,

(a) each partner of the JV shall be jointly and severally liable for all liabilities and ethical or legal obligations to the Procuring Entity for performance of the Contract;

(b) the JV partners shall nominate the **Leading Partner** as **Representative** being entrusted with the Contract administration and management at Site who shall have the authority to conduct all business including the receipt of payments for and on behalf of all partners of the JV;

(c) If there is a dispute that results in legal action being taken in court then action will be taken against all partners of the JV, if they are available and, if only one partner is available, then that partner alone shall answer on behalf of all partners and, if the complaint lodged is proven, the penalty shall be applicable on that partner alone as whatever penalty all the partners would have received; provided that if the other partners of the JV subsequently become available before the legal action has been completed, the Procuring Entity shall have the right to take action against those other partners of that JV as well.

(d) the composition or constitution and legal status of the JV shall not be altered without the prior approval of the Procuring Entity;

(e) alteration of partners, **except the Leading partner**, shall only be allowed if any of them is found to be incompetent or has any serious difficulties which may impact the overall implementation of the Works, whereby the incoming partner shall require to posses qualifications higher than that of the outgoing partner;

(f) "if any of the partners of JV has been debarred from participating in any procurement activity due to corrupt, fraudulent, collusive or coercive practices and while in case, the

Leading partner is found incompetent or has been debarred due to the same reasons stated herein the Contract shall be terminated pursuant to GCC Sub Clause 87.1(b)."

13. Possession of the Site

13.1 The Procuring Entity shall give possession of the Site or part(s) of the Site, to the Contractor on the date(s) stated in the **PCC**. If possession of a part of the Site is not given by the date stated in the **PCC**, the Procuring Entity will be deemed to have delayed the start of the relevant activities, and this will be a Compensation Event as stated under GCC Sub Clause 67.1(a).

14. Access to the Site

14.1 The Contractor shall allow the Project Manager and any person authorised by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

15. Procuring Entity's Responsibilities

15.1 The Procuring Entity shall pay the Contractor, in consideration of the satisfactory progress of execution and completion of the Works and physical services, and the remedying of defects therein, 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 Agreement.

15.2 The Procuring Entity shall make its best effort to guide and assist the Contractor in obtaining, if required, any permit, licence, and approvals from local public authorities for the purpose of execution of the Works and physical services under the Contract.

16. Approval of the Contractor's Temporary Works

16.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, who is to approve them, if they comply with the Specifications and Drawings.

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

16.3 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

16.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.

17. Contractor's Responsibilities

17.1 The Contractor shall execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract Agreement.

18. Taxes and Duties

18.1 The Contractor shall be entirely responsible for all applicable taxes, custom duties, VAT, and other levies imposed or incurred inside and outside Bangladesh.

19. Contractor's Personnel

19.1 The Contractor shall employ the key personnel named in the Schedule of Key Personnel, as referred to in the **PCC**, to carry out the functions stated in the Schedule or other personnel approved by the Project Manager.

19.2 The Project Manager will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are equal to or higher than those of the personnel named in the Schedule.

19.3 If the Project Manager asks the Contractor to remove a particular person who is a member of the Contractor's staff or work force from the Site, he or she shall state the reasons, and the Contractor shall ensure that the person leaves the Site within three (3) days and has no further connection with the work in the Contract.

20. Subcontracting

20.1 Subcontracting the whole of the Works by the Contractor shall not be permissible. The Contractor shall be responsible for the acts or defaults of any Subcontractor, his or her agents or employees, as if they were the acts or defaults of the Contractor.

20.2 The prior consent, in writing, of the Project Manager shall however be obtained for other proposed Subcontractor(s).

20.3 Nominated Subcontractor named in the Contract shall be entitled to execute the specific components of the Works stated in the **PCC**.

20.4 Subcontractors shall comply with the provisions of GCC Clause 38.

21. Other Contractors

21.1 The Contractor shall cooperate and share the Site with other Contractors, public authorities, utilities, the Project Manager and the Procuring Entity between the dates given in the Schedule of other Contractors. The Contractor shall also provide facilities and services for them as described in the Schedule. The Procuring Entity may modify the Schedule of other Contractors, and shall notify the Contractor of any such modification.

22. Project Manager's Decisions

22.1 Except where otherwise specifically stated in the **PCC**, the Project Manager will decide Contractual matters between the Procuring Entity and the Contractor in its role as representative of the Procuring Entity.

23. Delegation

23.1 The Project Manager may delegate any of his duties and responsibilities to his representative except to the Adjudicator, after notifying the Contractor, and may cancel any delegation, without retroactivity, after notifying the Contractor.

23.2 Any communications to the Contractor in accordance with such delegation shall have the same effect as if it was given by the Project Manager.

24. Instructions

24.1 The Contractor shall carry out all instructions of the Project Manager that comply with the applicable law.

25. Queries About the Contract Conditions

25.1 The Project Manager, on behalf of the Procuring Entity, will clarify queries on the Conditions of Contract.

26. Safety, Security and Protection of the Environment

26.1 The Contractor shall throughout the execution and completion of the Works and the remedying of any defects therein:

(a) take all reasonable steps to safeguard the health and safety of all workers working on the Site and other persons entitled to be on it, and to keep the Site in an orderly state;

(b) provide and maintain at the Contractor's own cost all lights, guards, fencing, warning signs and watching for the protection of the Works or for the safety on-site; and

(c) take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of the Contractors methods of operation.

27. Working Hours

27.1 The Contractor shall not perform any work on the Site on the weekly holidays, or during the night or outside the normal working hours, or on any religious or public holiday, without the prior written approval of the Project Manager.

28. Welfare of Labourers

28.1 The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's personnel relating to their employment, health, safety, welfare, immigration and shall allow them all their legal rights.

28.2 The Contractor, in particular, shall provide proper accommodation to his or her labourers and arrange proper water supply, conservancy and sanitation arrangements at the site for all necessary hygienic requirements and for the prevention of epidemics in accordance with relevant regulations, rules and orders of the Procuring Entity .

28.3 The Contractor, further in particular, shall pay reasonable wages to his or her labourers, and pay them in time. In the event of delay in payment the Procuring Entity may affect payments to the labourers and recover the cost from the Contractor.

29. Child Labor

29.1 The Contractor shall not employ any child to perform any work that is economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development in compliance with the applicable labor laws and other relevant treaties ratified by the Procuring Entity .

30. Discoveries

30.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Procuring Entity. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.

31. Procuring Entity's and Contractor's Risks

31.1 The Procuring Entity carries the risks that the Contract states are Procuring Entity's risks and the Contractor carries the risks that the Contract states are Contractor's risks.

32. Procuring Entity's Risks

32.1 From the Start Date until the Defects Correction Certificate has been issued, the following are Procuring Entity's risks:

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

i. use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or

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

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

32.2 From the Completion Date until the Defects Correction Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is Procuring Entity's risk, except loss or damage due to:

(a) a Defect which existed on the Completion Date;

(b) an event occurring before the Completion Date, which was not itself Procuring Entity's risk; or

(c) the activities of the Contractor on the Site after the Completion Date.

33. Contractor's Risks

33.1 From the Start Date until the Defects Correction Certificate has been issued the risks of personal injury, death, and loss of or damage to property including without limitation, the Works, Plant, Materials, and Equipment, which are not Procuring Entity's risks are Contractor's risks.

34. Copyright

34.1 The copyright in all drawings, documents, and other materials containing data and information furnished to the Procuring Entity by the Contractor herein shall remain vested in the Contractor, or, if they are furnished to the Procuring Entity directly or through the Contractor by any third party, including Suppliers of materials, the copyright in such materials shall remain vested in such third party.

34.2 The Contractor shall not, except for the purposes of performing the obligations under the Contract, without the written permission of the Procuring Entity disclose or make use of any specification, plan, design and drawing, pattern, sample or information furnished by or on behalf of the Procuring Entity.

35. Limitation of Liability

35.1 Except in cases of criminal negligence or wilful misconduct:

(a) the Contractor shall not be liable to the Procuring Entity, whether in Contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Procuring Entity; and

(b) the aggregate liability of the Contractor to the Procuring Entity, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective Works, or to any obligation of the Contractor to indemnify the Procuring Entity with respect to patent infringement.

36. Insurance

36.1 The Contractor shall provide, in the joint names of the Procuring Entity and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts specified in the **PCC** for the following events which are due to the Contractor's risks:

(a) loss of or damage to the Works, Plant, and Materials;

(b) loss of or damage to Equipment;

(c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and

(d) personal injury or death.

36.2 The Contractor shall deliver policies and certificates of insurance to the Project Manager, for the Project Manager's approval, before the Start Date. All such insurances shall provide for compensation to be payable in the types and proportions required to rectify the loss or damage incurred.

36.3 If the Contractor does not provide any of the policies and certificates required, the Procuring Entity may affect the insurance which the Contractor should have provided and recover the premiums the Procuring Entity has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

36.4 Alterations to the terms of insurance shall not be made without the approval of the Project Manager.

36.5 Both parties shall comply with conditions of the insurance policies.

37. Management and Progress Meetings

37.1 Either the Project Manager or the Contractor may require the other to attend a management and progress meeting. The business of such meeting shall be to review the progress and plans for remaining work and to deal with matters raised in accordance with the early warning procedure.

37.2 The Project Manager shall record the business of the meetings and provide copies of the record to those attending the meeting and to the Procuring Entity. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management and progress meeting or after the meeting, and stated in writing to all concerned.

38. Corrupt, Fraudulent, Collusive, Coercive (and Obstructive in case of Development

38.1 The Procuring Entity and the Development Partner requires that the Procuring Entity as well as the Contractor (including sub-contractors, agents, personnel, consultants and service providers), shall observe the highest standard of ethics during the implementation of procurement proceedings and the execution of contracts under public funds.

Partner) Practices

38.2 The Contractor (including sub-contractors, agents, personnel, consultants and service providers) shall permit the Procuring Entity and/or the Development Partner to inspect the Contractor's accounts and records and other documents relating to the submission of Tender and contract performance, and to have them audited by auditors appointed by the Procuring Entity and/or the Development Partner, if so required.

38.3 For the purposes of GCC Sub Clause 38.4, the terms set forth below as follows:

(a) "corrupt practice" means offering, giving or promising to give, receiving, or soliciting either directly or indirectly, to any officer or employee of a Procuring Entity or other public or private authority or individual, a gratuity in any form; employment or any other thing or service of value as an inducement with respect to an act or decision or method followed by a Procuring Entity in connection with a Procurement proceeding or Contract execution;

(b) "fraudulent practice" means the misrepresentation or omission of facts in order to influence a decision to be taken in a Procurement proceeding or Contract execution;

(c) "collusive practice" means a scheme or arrangement between two (2) or more Persons, with or without the knowledge of the Procuring Entity, that is designed to arbitrarily reduce the number of Tenders submitted or fix Tender prices at artificial, non-competitive levels, thereby denying a Procuring Entity the benefits of competitive price arising from genuine and open competition;

(d) "coercive practice" means harming or threatening to harm, directly or indirectly, Persons or their property to influence a decision to be taken in the Procurement proceeding or the execution of the Contract, and this will include creating obstructions in the normal submission process used for Tenders; or

(e) "Obstructive practice" (applicable in case of Development Partner) means deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede an investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and /or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation.

38.4 Should any corrupt, fraudulent, collusive, coercive practice (or obstructive practice in case of Development Partner) of any kind, in competing for or in executing the Contract, is determined by the Procuring Entity, then the Procuring Entity may, upon giving 28 days' notice to the Contractor, terminate the Contractor's employment under the Contract and the provisions of Clause 87 shall apply as if such expulsion had been made under sub-clause 87.1 (Termination for Default).

38.5 If corrupt, fraudulent, collusive or coercive (or obstructive in case of Development Partners) practices of any kind determined by the Procuring Entity or the Development Partner against the Contractor alleged to have carried out such practices, the Procuring Entity and/or the Development Partner shall:

(a) exclude the Contractor from further participation in the particular Procurement proceeding; or

(b) declare, at its discretion, the Contractor to be ineligible to participate in further Procurement proceedings, either indefinitely or for a specific period of time; or

(c) Procuring Entity can debar the Contractor for a period of 1 (one) to 2 (two) years for the procurement of all procuring entities due to fundamental breach of contract.

38.6 The Contractor shall be aware of the provisions on corruption, fraudulence, collusion and coercion in Section 64 of the Public Procurement Act, 2006 and Rule 127 of the Public Procurement Rules, 2008 and in case of Development Partner financed contract, the Procurement Guidelines of the Development Partner.

B. Time Control

39. Commencement of Works

39.1 Except otherwise specified in the **PCC**, the Commencement Date shall be the date at which the following precedent conditions have all been fulfilled and the Project Manager's instruction recording the agreement of both Parties on such fulfilment and instructing to commence the Works is received by the Contractor:

(a) signing of the Contract Agreement by both parties upon approval of the by relevant authorities;

(b) possession of the Site given to the Contractor as required for the commencement of the Works; and

(c) receipt by the Contractor of the Advance Payment under GCC Clause 73 provided that the corresponding Bank Guarantee has been delivered by the Contractor, if any.

39.2 The Contractor shall commence the execution of the Works as soon as is reasonably practicable by the **Start Date** as specified in the GCC Sub Clause **1.1(nn)** after the Commencement Date, and shall then proceed with the Works with due expedition and without delay.

40. Completion of Works

40.1 The Contractor shall carry out the Works in accordance with the Programme of Works submitted by the Contractor and as updated with the approval of the Project Manager as stated under GCC Clause 41 to complete them in all respects by the Intended Completion Date, as specified in the **PCC**.

41. Program of Works

41.1 Within the time stated in the **PCC**, the Contractor shall submit to the Project Manager for approval a Programme of Works showing the general methods, arrangements, order, and timing for all the activities in the Works. The programme may be in the form of an Implementation Schedule prepared in any software or other form acceptable to the Project Manager.

41.2 The Contractor shall submit to the Project Manager for approval of an updated Programme at intervals no longer than the period stated in the **PCC**. An update of the Programme shall be a Programme showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

41.3 If the Contractor does not submit an updated Programme of Works at the intervals as stated under GCC Sub Clause 41.2, the Project Manager may withhold an amount as stated in the **PCC** from the next payment certificate and continue to withhold this amount until the next due payment after the date on which the overdue Programme of Works has been submitted.

41.4 The Project Manager's approval of the Programme of Works shall not alter the Contractor's obligations. The Contractor may revise the Programme and submit it to the Project Manager again at any time for approval. A revised Programme shall show the effect of Variations and Compensation Events.

42. Pro Rata Progress

42.1 The Contractor shall maintain Pro Rata progress of the Works. Progress to be achieved shall be pursuant to GCC Clause 41 and shall be determined in terms of the value of the works done.

43. Early Warning

43.1 If at any time during performance of the Contract, the Contractor or its Subcontractors should encounter events, circumstances, conditions that may adversely affect the quality of the work, increase the original Contract Price or delay the execution of the Works, the Contractor shall promptly notify the Project Manager in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the Contractor's notice, the Project Manager shall evaluate the situation, and the Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced.

43.2 The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the original Contract Price and Completion Date. The Contractor shall provide the estimate and the Project Manager shall further proceed as soon as reasonably possible.

44. Extension of Intended Completion Date

44.1 The Contractor shall be entitled to an extension of the Intended Completion Date, if and to the extent that completion of the Works or any part thereof is or will be delayed by Compensation Events or a Variation or Extra Work Order.

44.2 If the Contractor considers itself to be entitled to an extension of the execution period as stated under GCC Sub Clause 44.1, the Contractor shall give notice, not later than twenty-eight (28) days after the Contractor became aware or should have become aware of the event or circumstance, to the Project Manager.

44.3 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within twenty-one (21) days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the extension of Intended Completion Date.

44.4 The Project Manager may extend the Intended Completion Date by twenty (20) percent of the original Contract time as stated under GCC Sub Clause 44.1, if a Compensation Event occurs or Variation Order or extra work Order issued. which does not make it possible to complete the execution of works without incurring additional cost.

44.5 In the case an extension of the Intended Completion Date required under GCC Sub Clause 44.3 is or will be more than twenty (20) percent of the original Contract time, approval of the Head of the Procuring Entity or an officer authorized by him or her for the same shall be required to be obtained.

44.6 Except in case of Force Majeure, as provided under GCC Clause 83, a delay by the Contractor in the execution Works shall render the Contractor liable to the imposition of Liquidated Damages pursuant to GCC Clause 71, unless an extension of the Intended Completion Date is agreed upon, pursuant to GCC Clause 44.3.

45. Delays Caused by Authorities

45.1 If the following conditions apply, namely:

(a) the Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities,

(b) these public authorities delay or disrupt the Contractor's work, and

(c) the delay or disruption was unforeseeable;

then this delay or disruption will be considered as a cause of delay under GCC Sub Clause 44.1.

45.2 The Project Manager shall notify the Contractor accordingly keeping the Procuring Entity posted.

46. Acceleration

46.1 When the Procuring Entity wants the Contractor to finish the Works before the Intended Completion Date, the Project Manager will obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Procuring Entity accepts these proposals, the Intended Completion Date will be advanced accordingly and confirmed by both the Procuring Entity and the Contractor.

46.2 If the Procuring Entity accepts the Contractor's priced proposals for acceleration, they will be incorporated in the Contract Price and treated as a **Variation** under GCC Clause 61.

47. Delays Ordered by the Project Manager

47.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.

48. Suspension of Work

48.1 The Project Manager may at any time instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage.

49. Consequences of Suspension

49.1 If the Contractor suffers delay and/or incurs Cost from complying with the Project Manager's instructions under GCC Clause 48 and/or from resuming the work, the Contractor shall give notice to the Project Manager and shall be entitled subject to GCC Clause 91 to:

(a) an extension of time for any such delay, if Completion is or will be delayed and

(b) payment of any such cost, which shall be included in the Contract Price.

49.2 After receiving this notice, the Project Manager shall proceed to agree or determine these matters.

49.3 The Contractor shall not be entitled to any extension of time for, or to any payment of the cost incurred in, making good the consequences of the Contractor's faulty design, workmanship or materials, or of the Contractor's failure to protect, store or secure in accordance with GCC Clause 48.

C. Quality Control

50. Execution of Works

50.1 The Contractor shall construct, install and carry out the Works and physical services in accordance with the Specifications and Drawings as scheduled in GCC Clause 6.

51. Examination of Works before covering up

51.1 All works under the Contract shall at all times be open to examination, inspection, measurements, testing and supervision of the Project Manager, and the Contractor shall ensure presence of its representatives at such actions provided proper advance notice is given by the Project Manager.

51.2 No part of the Works shall be covered up or put out of sight without the approval of the Project Manager. The Contractor shall give notice in writing to the Project Manager whenever any such part of the Works is ready for examination and, the Project Manager shall attend to such examination without unreasonable delay.

52. Identifying Defects

52.1 The Project Manager shall check the works executed by the Contractor and notify the Contractor of any Defects found. Such checking shall not relieve the Contractor from his or her obligations. The Project Manager may also instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.

53. Testing

53.1 If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event pursuant to GCC Sub Clause 67.

54. Rejection of Works

54.1 If, as a result of an examination, inspection, measurement or testing, of Works it is found to be defective or otherwise not in accordance with the Contract, the Project Manager may reject the Works by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected Works subsequently complies with the Contract.

55. Remedial Work

55.1 Notwithstanding any test or certification, the Project Manager may instruct the Contractor to:

(a) remove from the Site and replace any Plant or Materials which is not in accordance with the Contract,

(b) remove and re-execute any other work which is not in accordance with the Contract, and

(c) execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseeable event or otherwise.

55.2 The Contractor shall comply with the instruction issued under GCC Sub Clause 55.1 within a reasonable time, which shall be specified in the instruction, or immediately if urgency is specified under GCC Sub Clause 55.1(c).

55.3 If the Contractor fails to comply with the instruction issued under GCC Sub Clause 55.2, the Procuring Entity shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall be liable to pay all such costs arising from this failure.

56. Correction of Defects

56.1 The Project Manager shall give notice to the Contractor, with a copy to the Procuring Entity and others concerned, of any Defects before the end of the Defects Liability Period, which begins at Completion Date, and is defined in the **PCC**. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

56.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager's notice.

57. Uncorrected Defects

57.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected by it, and the Contractor shall remain liable to pay the expenditures incurred on account of correction of such Defect.

D. Cost Control

58. Contract Price

58.1 The Contract Price shall be as specified in the Contract Agreement subject to any additions and adjustments thereto, or deductions therefrom, as may be made pursuant to Contract.

59. Bill of Quantities

59.1 The Bill of Quantities (BOQ) shall contain priced items for the construction, installation, testing, and commissioning work to be done by the Contractor.

59.2 The BOQ is used to calculate the Contract Price. The Contractor is paid for the quantity of the work done at the rate in the BOQ for each item.

59.3 Items of works quantified in the BOQ for which no rates have been quoted shall be deemed covered by the amounts at rates of other items in the Contract and, shall under no circumstances be paid for, by the Procuring Entity.

60. Changes in the Quantities and Unit Rate

60.1 If the final quantity of the work done for any particular item in the BOQ increases by more than twenty-five (25) percent and, such increase in quantity of that particular item alone concurrently causes the original Contract Price to exceed by more than one (1) percent, the Project Manager shall adjust the unit rate of the item to allow for the change.

60.2 If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the BOQ.

61. Issue Variation or Extra Work Order

61.1 The Project Manager may issue a **Variation Order** to the Contractor to cover increase or decrease in quantities, including the introduction of new work items (non-Tendered items) that are either due to change of plans, design or alignment to suit actual field conditions, within the general scope and physical boundaries of the contract.

61.2 The Project Manager may issue an **Extra Work Order** to cover the introduction of such new works necessary for the completion, improvement or protection of the original works which were not included in the original contract, on the grounds where there are subsurface or latent physical conditions at the site differing materially from those indicated in the contract, or where there are duly unknown physical conditions at the site of an unusual nature differing materially from those usually encountered and generally recognized as inherent in the work or character provided for in the Contract.

61.3 The Project Manager deems it necessary that a Variation or Extra Work Order should be issued, he or she shall prepare the proposed order, the necessary plans , his or her computations as to the quantities of the additional Works involved per item indicating the specific locations where such Works are needed, the date of his or her inspections and investigations thereon, and the log book thereof, and a detailed estimate of the unit cost of such items of work as stated under GCC Clause 62, together with his or her justifications for the need of such Variation or Extra Work Order, and shall submit the same to the Approving Authority. Any Amend to the contract that happens within the approved BOQ items and doesn't change the contract price shall be approved by the HOPE or delegated officer.

61.4 The Head of the Procuring Entity may, in exceptions to the GCC Sub Clause 61.3 and subject to the availability of funds, in the event of extreme emergency and when time is of the essence, authorize the immediate start of work under any Variation or Extra Work Order; provided that the cumulative increase in the value of

Works not yet duly approved exceeded ten (10) percent of the adjusted original Contract Price.

61.5 Increase or decrease in the quantities of any item of work included in the BOQ for the reasons other than those stated under GCC Sub Clause 61.1 and 61.2, in particular for field level actual measurements under this contract (admeasurements), not necessarily however, shall constitute a **Variation**.

61.6 All Variations and Extra work orders under the Contract shall be included in the updated Programme of Works produced by the Contractor.

62. Costing of Variations or Extra Orders

62.1 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) working days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.

62.2 If the item of work in the Variation corresponds to an item of work in the BOQ and if, in the opinion of the Project Manager, the increased quantity and cost of the works of that particular item does not concurrently cause to exceed the limit stated in GCC Sub Clause 60.1, the same unit rate in the BOQ shall be used to calculate the cost of the Variation. If the item of work in the Variation does not correspond to an item in the BOQ, the unit rates for the new items of works shall be determined based on (i) the direct unit costs used in the original Contract for other items (e.g. unit cost of cement, steel bar, labour rate, equipment rental, etc) as indicated in the Contractor's price breakdown of the cost estimate, if available or (ii) fixed prices acceptable to both, the Procuring Entity and the Contractor, based on market prices. The direct cost of the new work items based on (i) or (ii) stated herein shall then be combined with the mark-up factor (i.e. profit, overhead and VAT) used by the Contractor in its Tender to determine the unit rate of the new items of work.

62.3 If the Contractor's quotation is found to be unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.

62.4 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning under GCC Sub Clause 43.1.

62.5 The time for processing of a Variation and an Extra Work Order from its preparation to approval shall not exceed thirty (30) working days.

63. Cash Flow Forecasts

63.1 When the Programme of Works is updated under GCC Sub Clause 41.2, the Contractor shall provide the Project Manager with an updated cash flow forecast.

64.1 The basis for payment certificates shall be BOQ used to determine the Contract Price.

64. Payment Certificates

64.2 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the works executed less the cumulative amount certified previously.

64.3 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.

64.4 The value of work executed shall be determined by the Project Manager.

64.5 The value of work executed may also include the valuation of Variations or Extra Work Orders, Certified Dayworks and Compensation Events.

64.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

65. Payments to the Contractor

65.1 Payments shall be adjusted for deductions for advance payments and retention. The Procuring Entity shall pay the Contractor the amounts certified by the Project Manager within twenty-eight (28) days of the date of each certificate after due adjustments for deductions for advance payments, retention and any other additions or deductions which may have become due under the Contract or otherwise, including those under GCC Clause 91.

65.2 Payments for Works under Variation Orders or Extra Work Orders satisfactorily accomplished pursuant to GCC Sub Clause 61 may be made only after approval of the same by the Approving Authority or next higher, as appropriate.

65.3 Payments due to the Contractor in each certificate shall be made into the Bank Account, in any scheduled Bank of Bangladesh, of the legal title of the Contract specified in the **PCC**, nominated by the Contractor in the currency specified in the Contract.

66. Delayed Payment

66.1 If the Procuring Entity makes a late payment, the Contractor shall be paid interest on the late payment in the next payment at the rate as specified in the **PCC**. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made.

66.2 If an amount certified is increased in a subsequent certificate as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.

67. Compensation Events

67.1 The following shall be Compensation Events:

(a) The Procuring Entity does not give access to or possession of the Site or part of the Site by the Site Possession Date stated in the GCC Sub Clause 13.1;

(b) The Procuring Entity modifies the Schedule of other Contractors in a way that affects the works of the Contractor under the Contract;

(c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time;

(d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects;

(e) The Project Manager unreasonably does not approve a subcontract to be let, if applicable;

(f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Notification of Award from the information issued to Tenderers (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site; Other Contractors, public authorities, utilities, or the Procuring Entity do not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor;

(g) The advance payment is delayed;

(h) The effects on the Contractor of any of the Procuring Entity's Risks;

(i) The Project Manager unreasonably delays issuing a Completion Certificate;

(j) A situation of Force Majeure has occurred, as defined in GCC Clause 83; and

(k) Other Compensation Events described in the Contract or determined by the Project Manager in the **PCC** shall apply.

67.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended, only on justifiably acceptable grounds duly recorded.

67.3 As soon as the Contractor has provided information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost, the Project Manager shall assess it, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager will assume that the Contractor will react competently and promptly to the event.

67.4 The Contractor shall not be entitled to compensation to the extent that the Procuring Entity's interests are adversely affected by the Contractor not having given early warning or not having cooperated with the Project Manager.

68. Adjustments for Changes in Legislation

68.1 Unless otherwise specified in the Contract, if between the date twenty-eight (28) days before the submission of Tenders for the Contract and the date of the last Completion Certificate, any law, regulation, ordinance, order or bylaw having the force of law is enacted, promulgated, abrogated, or changed in Bangladesh (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the Completion Date and/or the Contract Price, then such

Completion Date and/or Contract Price shall be correspondingly increased or decreased, to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract.

68.2 The Project Manager shall adjust the Contract Price on the basis of the change in the amount of taxes, duties, and other levies payable by the Contractor, provided such changes have not already been accounted for in the price adjustment as defined in GCC Clause 69 and/or reflected in the Contract Price.

69. Price Adjustment

69.1 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the **PCC**. If so provided, the amounts as certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amount. The formulae indicated below applies:

P= A + B (Im/Io)

where:

P is the adjustment factor

A and **B** are Coefficients specified in the **PCC**, representing the nonadjustable and adjustable portions, respectively, of the Contract; and

Im is the Index during the month the work has been executed and

Io is the Index prevailing twenty-eight (28) days prior to the deadline for submission of Tender.

The Indexes to be used is as published by the Bangladesh Bureau of Statistics (BBS) on a monthly basis. In case not available, then other countries or authorities of the sources mentioned in **Appendix to the Tender** may be used.

70. Retention Money

70.1 The Procuring Entity may retain from each progressive payment due to the Contractor at the percentage specified in the **PCC** until completion of the whole of the Works under the Contract.

70.2 On completion of the whole of the Works, the first half of the total amount retained under GCC Sub Clause 70.1 shall be returned to the Contractor and the remaining second half after the Defects Liability Period has passed and the Project Director has certified in the form of **Defects Corrections Certificate.**

70.3 On completion of the whole of the Works, the Contractor may substitute an irrevocable unconditional Bank Guarantee from any scheduled Bank of Bangladesh, in the format as specified (**Form PW3-12**), without any alteration, acceptable to the Procuring Entity for the second half of the retention money as stated under GCC Sub Clause 70.2.

71. Liquidated Damages

71.1 Except as provided under GCC Sub Clause 83, if the Contractor fails to complete the Works and physical services within the Intended Completion Date or extended Intended Completion Date, the Procuring Entity shall, as Liquidated Damages, deduct from the Contract Price, a sum at the percent-rate per day of delay as specified in the **PCC**, of the contract value of the uncompleted works or part thereof completed after the Intended Completion Date or extended Intended Completion Date, as applicable. The

total amount of Liquidated Damages or Delay Damages shall not exceed the amount specified in the **PCC**. The Procuring Entity may deduct Liquidated Damages from payments due to the Contractor. Payment of Liquidated damages shall not affect the Contractor's liabilities.

71.2 If the Intended Completion Date is extended after Liquidated Damages have been paid, the Project Directorshall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate.

72. Bonus

72.1 The Contractor shall be paid a Bonus calculated at the percent-rate per day **if stated in the PCC** for each day (less any days for which the Contractor is paid for acceleration) that the Completion of the whole of the Works is earlier than the Intended Completion Date. The Project Manager shall require certifying that the Works are complete, although they may not have fallen due to being complete as per approved updated Programme of Works.

73. Advance Payment

73.1 The Procuring Entity shall make advance payment, if so specified in the **PCC**, to the Contractor in the amounts and by the dates specified in the **PCC** against an irrevocable unconditional Bank Guarantee issued by any scheduled Bank of Bangladesh in the format as specified (**Form PW3-11**), without alteration, and acceptable to the Procuring Entity of an amount equal to the advance payment. The Guarantee shall remain effective until the advance payment has been amortized, but the amount of the Guarantee shall be progressively reduced by the amounts amortized by the Contractor. Interest will not be charged on the advance payment.

73.2 The Contractor shall use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used for such specific purposes by supplying copies of invoices or other documents to the Project Manager.

73.3 The advance payment shall be amortized by deducting at proportionate rate from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works as specified in the **PCC**. No account shall be taken of the advance payment or its amortization in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.

73.4 If the amortization of advance payment has not been completed by twenty-eight (28) days prior to the expiry date of the Guarantee stated under GCC Sub Clause 73.1, the Contractor shall correspondingly extend the validity of the Guarantee for a period so long the advance payment is fully amortized. The Bank Guarantee for advance payment shall be released when the same has been fully amortized.

74. Performance Security

74.1 The Procuring Entity shall notify the Contractor of any claim made against the Bank issuing the Performance Security.

74.2 The Procuring Entity may claim against the security if any of the following events occurs for fourteen (14) days or more.

(a) The Contractor is in breach of the Contract and the Procuring Entity has duly notified him or her; and

(b) The Contractor has not paid an amount due to the Procuring Entity and the Procuring Entity has duly notified him or her.

74.3 In the event as stated under GCC Sub Clause 74.2, the Contractor is liable to pay compensation under the Contract amounting to the full value of the security or more, the Procuring Entity may call the full amount of the security.

74.4 The Performance Security furnished at the time of signing of the Contract Agreement shall be substituted, after the issuance of certificate of Completion of works by the Project Manager, by a new Security covering fifty (50) percent amount of the Performance Security to cover the Defects Liability Period.

74.5 If there is no reason to call the security, the security shall be discharged by the Procuring Entity and returned to the Contractor after the Defects Liability period has passed and the Project Manager has certified in the form of Defects Corrections Certificates and the Procuring Entity shall not make any claim under the security, except for amounts to which the Procuring Entity is entitled under this Contract. In the event this Contract is significantly below the updated official estimated cost or unbalanced as a result of front loading, the Procuring Entity shall call the full amount of the security in the circumstances stated under GCC Sub Clause 74.3.

75. Provisional Sums

75.1 Provisional Sums shall only be used, in whole or in part, in accordance with the Project Manager's instructions.

75.2 Plants, Materials or Services to be purchased by the Contractor under the provisions of GCC Sub Clause 75.1 from Nominated Subcontractor(s) or for meeting the other expenditures under the Contract, and for which there shall be included in the Contract price, the actual amounts paid or due to be paid by the Contractor, and a sum for profit, overhead and VAT, as applicable, calculated as a percentage of these actual amounts by applying the relevant percentage rate as specified in the **PCC.**

76. Day works

76.1 If applicable, the Day works rates in the Contractor's Tender shall be used for small additional amounts of work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.

76.2 All works to be paid for as Day works shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be certified and signed by the Project Manager within seven (7) days of the works being done.

76.3 The Contractor shall be paid for Day works subject to obtaining signed Day works forms.

77. Cost of Repairs to Loss or Damages

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

E. Completion of the Contract

78. Completion

78.1 The Contractor shall apply by notice to the Project Manager for issuing a Completion Certificate of the Works, and the Project Manager shall do so upon deciding that the work is completed.

79. Taking Over

79.1 The Procuring Entity shall take over the Site and the Works within seven (7) days of the Project Manager's issuing a certificate of Completion.

80. Amendment to Contract

80.1 The amendment to Contract shall generally include extension of time to the Intended Completion Date, increase or decrease in original Contract Price and any other changes acceptable under the conditions of the Contract.

80.2 The Procuring Entity shall amend the Contract, incorporating the changes approved, in accordance with the Delegation of Financial Power or Sub-delegation thereof and, introduced to the original terms and conditions of the Contract

81. Final Account

81.1 The Contractor shall submit with a detailed account of the total amount that the Contractor considers payable under the Contract to the Project Manager before the end of the **Defects Liability Period**.

81.2 The Project Manager shall certify the **Final Payment** within fifty-six (56) days of receiving the Contractor's account if the payable amount claimed by the Contractor is correct and the corresponding works are completed.

81.3 If it is not, the Project Manager shall issue within fifty-six (56) days a **Defects Liability Schedule** that states the scope of the corrections or additions that are necessary.

81.4 If the **Final Account of Works** submitted under GCC Sub Clause 81.1 is unsatisfactory even after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.

82. As-built Drawings and Manuals

82.1 If "As Built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the **PCC**.

82.2 If the Contractor does not supply the Drawings and/or Manuals by the dates specified in GCC Sub Clause 82.1, or they do not receive the Project Manager's approval, the Project Manager shall withhold a nominal amount specified in the **PCC** from payments due to the Contractor.

83. Force Majeure

83.1 Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind stated below;

(a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies;

(b) rebellion, terrorism, sabotage by persons other than the Contractor's personnel, revolution, insurrection, military or usurped power, or civil war ;

(c) riot, commotion, disorder, strike or lockout by persons other than the Contractor's personnel ;

(d) munitions of war, explosive materials, ionising radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity ; and

(e) natural catastrophes such as fires, floods, epidemics, quarantine restrictions, freight embargoes, cyclone, hurricane, typhoon, tsunami, storm surge, earthquake, hill slides, landslides, and volcanic activities.

83.2 The Head of Procuring Entity decides the existence of a Force Majeure that will be the basis of the issuance of order for suspension of Works as stated under GCC Sub Clause 48.1.

84. Notice of Force Majeure

84.1 If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice, within fourteen (14) days after the party became aware, to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented.

84.2 Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.

85. Consequences of Force Majeure

85.1 The Contractor shall not be liable for forfeiture of its security, liquidated damages, or termination for default if and to the extent that it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

85.2 If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under GCC Sub Clause 84, and suffers delay and/or incurs cost by reason of such Force Majeure, the Contractor shall be entitled subject to GCC Sub Clause 91 to:

(a) an extension of time for any such delay, if completion is or will be delayed, under GCC Clause 44, and

(b) if the event or circumstance is of the kind described sub-paragraphs (a) to (e) of GCC Sub Clause 83.1 occurs in the country, payment of any such cost, including the costs of rectifying or replacing the Works and physical services damaged or destructed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in GCC Clause 36.

85.3 After receiving notice under GCC Sub Clause 84.1, the Project Manager shall proceed to determine these matters under the provisions of the Contract.

86. Release from Performance

86.1 Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both Parties to fulfil its or their contractual obligations or which, under the law governing the Contract, entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other party of such event or circumstance:

(a) the Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract, and

(b) the sum payable by the Procuring Entity to the Contractor shall be the same as would have been payable under GCC Sub Clause 88.3 if the Contract had been terminated under GCC Sub Clause 87.3.

F. Termination and Settlement of Disputes

87. Termination

87.1 **Termination for Default**

(a) The Procuring Entity or the Contractor, without prejudice to any other remedy for breach of Contract, by giving twenty-eight (28) days written notice of default to the other party, may terminate the Contract in whole or in part if the other party causes a fundamental breach of Contract. Fundamental breaches of the Contract shall include, but shall not be limited to, the following:

(i) the Contractor stops work for twenty-eight (28) days when no stoppage of work is shown on the current Programme and the stoppage has not been authorized by the Project Manager;

(ii) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within eighty-four (84) days;

(iii) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager;

(iv) the Contractor does not maintain a Security, which is required;

(v) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of Liquidated Damages can be paid, as specified in GCC Sub Clause 71;

(vi) the Contractor has subcontracted the whole of the Works or has assigned the Contract without the required agreement and without the approval of the Project Manager;

(vii) the Contractor, in the judgment of the Procuring Entity has engaged in corrupt or fraudulent practices, as

defined in GCC Sub Clause 38, in competing for or in executing the Contract.

(viii) A payment certified by the Project Manager is not paid by the Procuring Entity to the Contractor within eighty-four (84) days of the date of the Project Manager's certificate.

87.2 **Termination for Insolvency**

The Procuring Entity and the Contractor may at any time terminate the Contract by giving twenty-eight (28) days written notice to the other party if either of the party becomes bankrupt or otherwise insolvent. In such event, termination will be without compensation to any party, provided that such termination will not prejudice or affect any right of action or remedy that has accrued or will accrue thereafter to the other party.

87.3 **Termination for Convenience**

(a) The Procuring Entity, by giving twenty-eight (28) days written notice sent to the Contractor, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Procuring Entity's convenience, the extent to which performance of the Contractor under the Contract is terminated, and the date upon which such termination becomes effective.

(b) The Procuring Entity shall not terminate the contract under GCC Sub Clause 87.3 (a) in order to execute the Works itself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor as stated under GCC Sub Clause 87.1(a).

87.4 In the event the Procuring Entity terminates the Contract in whole or in part, the Procuring Entity shall accept the portion of the Works that are complete and ready for handing over after the Contractor's receipt of notice of termination of the Contract. For the remaining portion of the Works, the Procuring Entity may elect:

(a) to have any portion completed by the Contractor at the Contract terms and prices; and /or

(b) to cancel the remainder and pay to the Contractor an agreed amount for partially completed Works and for materials and parts previously procured by the Contractor, or

(c) except in the case of termination for convenience as stated under GCC Sub Clause 87.3, engage another Contractor to complete the Works, and in that case the Contractor shall be liable to the Procuring Entity for any cost that may be incurred in excess of the sum that would have been paid to the Contractor, if the work would have been executed and completed by him or her.

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

87.6 The expiration of the Intended Completion Date under GCC Clause 44 and, the initiation of settlement of disputes like amicable or adjudication and arbitration under GCC Clause 92 shall not be deemed a termination of the Contract under GCC Clause 87.

88. Payment upon Termination

88.1 If the Contract is terminated because of a fundamental breach of Contract under GCC Sub Clause 87.1 by the Contractor, the Project Manager shall issue a certificate for the value of the Works done and Plant and Materials ordered less advance payments received up to the date of the issue of the certificate and, further less the amount from percentage to apply to the contract value of the works not completed, as indicated in the **PCC**. If the total amount due to the Procuring Entity exceeds any payment due to the Contractor, the difference shall be a debt payable to the Procuring Entity.

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

88.3 If the Contract is terminated for reasons of Force Majeure, the Project Manager shall determine the value of the work done and issue a Payment Certificate which shall include:

(a) the amounts payable for any work carried out for which unit rates or prices are stated in the Contract;

(b) the cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Procuring Entity when paid for by the Procuring Entity, and the Contractor shall place the same at the Procuring Entity's disposal;

(c) other costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works;

(d) the cost of removal of Temporary Works and Contractor's Equipment from the Site; and

(e) the cost of repatriation of the Contractor's staff and labour employed wholly in connection with the Works at the date of termination.

89. Property

89.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Procuring Entity if the Contract is terminated because of the Contractor's default stated under GCC Sub Clause 87.1.

90. Frustration

90.1 If the Contract is frustrated by the occurrence of a situation of Force Majeure as defined in GCC Sub Clause 83, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all works carried out before receiving it and for any work carried out afterwards to which a commitment was made.

G. Claims, Disputes and Arbitration

91. Contractor's Claims

91.1 If the Contractor considers himself to be entitled to any extension of the Completion Time and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Procuring Entity, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than twenty-eight (28) days after the Contractor became aware, or should have become aware, of the event or circumstance.

91.2 If the Contractor fails to give notice of a claim within such period of twenty-eight (28) days, the Intended Completion Date shall not be extended, the Contractor shall not be entitled to additional payment, and the Procuring Entity shall be discharged from all liability in connection with the claim.

91.3 Within forty two (42) days after the Contractor became aware or should have become aware of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Project Manager, the Contractor shall send to the Project Manager a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed, for settlement.

92. Settlement of Disputes

92.1 **Amicable settlement**

The procuring Entity and the Contractor shall use their best efforts to settle amicably all possible disputes arising out of or in connection with this Contract or its interpretation.

92.2 **Adjudication**

(a) If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within fourteen (14) days of notification of the Project Manager's decision in writing.

(b) The Adjudicator named in the **PCC** is jointly appointed by the parties. In case of disagreement between the parties, the Appointing Authority designated in the **PCC** shall appoint the Adjudicator within fourteen (14) days of receipt of a request from either party.

(c) The Adjudicator shall give its decision in writing to both parties within twenty-eight (28) days of a dispute being referred to it.

(d) The Contractor shall make all payments (fees and reimbursable expenses) to the Adjudicator, and the Procuring Entity shall reimburse half of these fees through the regular progress payments.

(e) Should the Adjudicator resign or die, or should the Procuring Entity and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract; a new Adjudicator will be jointly appointed by the Procuring Entity and the Contractor. In case of disagreement between the Procuring Entity and the Contractor the Adjudicator shall be designated by the Appointing Authority within fourteen (14) days of receipt of a request from either party as stated under GCC Sub Clause 92.2 (b)

92.3 **Arbitration**

(a) If the parties are unable to reach a settlement as per GCC Clauses 92.1 and 92.2 within twenty-eight (28) days of the first written correspondence on the matter of disagreement, then either party may give notice to the other party of its intention to commence arbitration in accordance with GCC Sub Clause 94.3(b).

(b) The arbitration shall be conducted in accordance with the Arbitration Act (**Act No 1 of 2001**) of Bangladesh as at present in force and in the place shown in the **PCC**.

SECTION-8: PARTICULAR CONDITIONS OF CONTRACT

Instructions for completing the Particular Conditions of Contract are provided in italics in parenthesis for the relevant GCC Clauses.	
GCC Clause	**Amendments of, and Supplements to, Clauses in the General Conditions of Contract**
GCC 1.1(b)	Approving authority means Head of the Procuring Entity: (Managing Director, Bengal Hotels & Resorts Limited).
GCC 1.1(e)	Managing Director, Bengal Hotels & Resorts Limited gives decision on overall issues and Project Management & Construction Supervision Consultant (PMC) works as an executer of decision.
GCC 1.1(f)	**Completion Certificate** means the Certificate issued by the PMC as evidence that the Contractor has executed the Works and physical services in all respects as per design, drawing, specifications and Conditions of Contract.
GCC 1.1(g)	**Completion Date** is the actual date of completion of the Works 12 (Twelve) Calendar Months from the Start date of work.
GCC 1.1(j)	The Contractor is *[Name, address, and name of authorized representative]*
GCC 1.1(q)	**Defects Correction Certificate** is the certificate issued by the PMC upon correction of defects by the Contractor.
GCC 1.1(x)	**Head of the Procuring Entity** means Managing Director, Bengal Hotels and Resorts Limited (BHRL), a corporate body established under the Companies Act;
GCC 1.1 (y)	The Intended completion date is the actual date of completion of the Works within 12 (Twelve) Calendar Months from the Start date of work.
GCC 1.1 (bb)	The original Contract Price is *[insert the amount in the NOA]*
GCC 1.1 (ff)	<u>The Procuring Entity is:</u> **Bengal Hotels and Resorts Limited** Address: Bengal House, 75 Gulshan Avenue, Dhaka 1212, Bangladesh.
GCC 1.1 (gg)	<u>Project Management Consultant (PMC):</u> **Deltadesh (Pvt.) Ltd.** Address: PMC Project Office Oriental Hasnahena, Apt. # B5, Plot # 49 & 51, Road # 6, Block- C, Niketon, Gulshan 1, Dhaka- 1212 E-mail: imrul@deltadesh.com Mobile: +8801966614018
GCC 1.1(kk)	The site of the work is situated at 208, Tejgaon-Gulshan Link Road, Dhaka, Bangladesh.

GCC 1.1(nn)	The Start Date shall be **7 (Seven)** Calendar days from the issuance of work order.
GCC 1.1(rr)	The Works consist of Construction of (3B+G+26)-Storied Bengal Hotels and Resorts Project at 208, Tejgaon-Gulshan Link Road, Gulshan, Dhaka, Bangladesh. **Work Package: BHRL-G&F**
GCC 2.5	The Sectional Completion Dates are: **Not Applicable**
GCC 3.1	The Procuring Entity's address for the purpose of communications under this contract is: Contact person: Engr. Md. Imrul Kalam Project Manager, PMC <u>Project Management Consultant (PMC):</u> **Deltadesh (Pvt.) Ltd.** Address: PMC Project Office Oriental Hasnahena, Apt. # B5, Plot # 49 & 51, Road # 6, Block- C, Niketon, Gulshan 1, Dhaka- 1212 E-mail: imrul@deltadesh.com Mobile: +8801966614018
	The Contractor's address for the purpose of communications under this contract is: Contact person: Address: Tel: Fax: e-mail address:
GCC 6.1 (j)	Other documents forming part of the Contract are; **Not Applicable**
GCC 9.1	The Contractor or the Subcontractor that is a national of, or registered in, the following countries are not eligible**: Israel**
GCC 9.2	The Tenderer shall own or have proven access to hire or lease of the major construction equipment, in full working order as follows scanned copies of documentary evidence shall be submitted otherwise Tender may be considered as non-responsive.
GCC 13.1	Site or part(s) of the Site shall be handed over to the Contractor on the following date(s); Issuance of work order date
GCC 20.3	Nominated Subcontractor(s) named below; ____ *[insert name(s)]*_____ shall be entitled to execute the following specific components of the Works *[state none, if not applicable]*
GCC 27	The contractor working hour will be depending on the project need basis as per PMC instruction.

GCC 36.1	The insurance cover shall be the Contractor's All Risk (CAR) insurance
GCC 40.1	The completion date is the actual date of completion of the Works 12 (Twelve) Calendar Months from the Start date of work.
GCC 41.1	The Contractor shall submit a Programme for the Works within 15(Fifteen) days of signing the Contract.
GCC 41.2	The period between Programme updates is Weekly
GCC 41.3	The amount to be withheld for late submission of an updated Programme schedule from next payment certificate is 25 (Twenty-Five) Percent.
GCC 56.1	The Defects Liability Period is 12 months. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.
GCC 65.3	The particulars of the Bank Account nominated are as follows : Title of the Account : *[insert title to whom the Contract awarded]* Name of the Bank : *[insert name with code, if any]* Name of the Branch : *[insert branch name with code ,if any]* Account Number : *[insert number]* Address : *[insert location with district]* Tel : Fax : e-mail address : *[information furnished by the Contractor shall be substantiated by the concerned Bank and authenticated by the Procuring Entity]*
GCC 66.1	Not Applicable.
GCC 67.1(a)	Not Applicable.
GCC 69.1	The Contract is **not** subject to price adjustment.
GCC 70.1	The Retention Money shall be deducted @ 5%-10% (Five to Ten Percent) which depends upon the availability of the Bank Guarantee (BG) from the successful Tenderer's payable invoices during Contract implementation, if awarded the Contract.
GCC 71.1	The number of Liquidated Damages is 0.05 (point zero five) percent of the contract value of the uncompleted works or any part thereof completed after expiry of the Intended Completion Date or extended Intended Completion Date, as applicable, per day of delay. The maximum number of Liquidated Damages for the uncompleted Works or any part thereof is 5 (Five) percent of the final Contract Price of the whole of the Works.
GCC 72.1	Not Applicable
GCC 73.1	The Client shall pay the equal amount of the contractor's submitted Bank Guarantee (BG) as Mobilization Advance against Bank Guarantee of equal Amount. The Advance amount shall be paid within 14 (fourteen) days of Submission of Advance Payment Guarantee.

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GCC 73.3	The Advance Amount shall be released from the Contractor's R.A Bills in 10 (Ten) equal instalment starting from 2nd R.A Bill.
GCC 75.2	Provisional Sum shall be 2% (Two Percent) of the Contract Price at the disposal of Project Director of Procurement Entity.
GCC 82.1	The date by which "**as-built**" drawings are required is: The date by which operating and maintenance manuals are required is :
GCC 88.1	The percentage to apply to the contract value of the works not completed, representing the Procuring Entity's additional cost for completing the incomplete Works is: **15** (fifteen) percent.
GCC 92	The name of the Adjudicator will be declared considering the situation.
Additional PCC 0.1	Other Terms and Conditions: 1. No labour shed, store etc. will be allowed at site 2. Electricity and Water supply connection will have to be arranged by the Procuring Entity. 3. Sanitation facilities must be provided by the Procuring Entity at site for the labours. 4. Fabrication, welding, placing in position will be done by the contractor. 5. Tower Crane, Construction Lift, will be supplied by the Procuring Entity at site. 6. The Contractor shall provide a work schedule of the Project within Seven days from the date of receiving of Letter of Intent (LOI) to fully complete the Project within 90 days from the date of receiving of Letter of Intent (LOI). 7. The Contractor will submit a complete shop drawing and working drawing of the Project within 10 days from the date of signing of this Contract Agreement. 8. The Contractor shall obtain approval of colour and quality of glass and metals from the Owner prior/BoQ to the order of imports. 9. All types of glasses, fixtures & fittings, standard metal, welding, support of and all foreign & local materials have to be arranged and done by Contractor according to the approved material samples and shop drawing. 10. The Contractor will bring all types of erection and fixing equipment and tools including vertical transportation system at Contractor's cost for lifting all imported and local items. Owner will provide necessary power required for the work and installation of the system but the contractor will bear the cost of consumption based on a sub meter installed for contractor. However, the Contractor must make itself satisfied that the scaffolding is safe for their work. Contractor may use Owner's tower crane support if available at site. 11. Contractor shall provide all tools, tools consumable material & all other consumable material.

	12. The Contractor will be liable for the security & storage of both imported and local items at site under Contractor's disposal at its own cost. Any damage, theft, breakage or pilferage shall be on Contractor's account and if so, Contractor will replace them at its own cost until handover of the completed project. 13. The Specifications, BOQ, shop drawings and catalogues submitted with Contractor's offer and available with imported items shall be an integral part of this agreement and property of the Owner. 14. The owner reserves the right to change or add any terms in this contract and even cancel this at any time without assigning any reason thereof and may engage another party for completion of the work if situation demands due to contractor's delay or poor and unacceptable quality of work in the eye of the Owner's EME/P&C Department and consultant or any action or omission by the contractor which may cause damage to the Owner, either financial or otherwise. Under this circumstances, Owner's appointed consultant shall decide any amount Contractor owe to Owner or owe to Contractor. If it happens that Contractor owe to Owner any amount, the Contractor shall refund the said amount to the Owner at once within maximum 15 days. If not, the Owner shall have the right to get same by encasement of Contractors bank guarantee with reference to the contract. If it happens that Owner owe the Contractor any amount, Owner shall pay to the Contractor. For avoidance of doubt, it is clarified that in the event the agreement is terminated due to fault of negligence of the contractor, the Contractor shall be indemnify and hold the Owner harmless from and against any losses, damages, costs, expenses or any other losses of whatever nature that may have caused to Owner. 15. At any point of time the physical check and test can be done by Owner's/consultant without any prior notice to Contractor. The cost of the check and test (excluding the tests mentioned in the approved bill of quantities) including the flight and accommodation of the Owner's consultants and other Owner's representatives, if any, shall be borne by the Owner. The parties shall keep the terms, conditions, and covenants of this Contract confidential for greater interest of the Parties. 16. The Quality of Local/LC Material supplied by the Contractor shall be checked by BHRL team before installation. And all type of MTC (Mill Test Certificate) should be provided by the contractor during each shipment of materials supply. 17. Contractor has to follow all installation & other rules from (Section-05) scope of works as well.
Additional PCC 0.2 (GCC – 65)	The bills shall be certified by PMC/BHRL before submission to Procuring Entity.
Additional PCC 0.3 (GCC – 32)	Procuring Entity risks are covered with the Contractors" CAR" (Contractors all Risk) policy.

SECTION-8: TENDER AND CONTRACT FORMS

Form	Title
	Tender Forms
PW3 – 1	Tender Submission Letter
PW3 – 2	Tenderer Information
PW3 – 3	JV Partner Information (*if applicable*)
PW3 – 4	Subcontractor Information (*if applicable*)
PW3 – 5	Personnel Information
PW3-5A	Tenderer's Past Performance Information (Not used)
PW3-5B	Tenderer's Capacity Information (Not used)
PW3 – 6	Bank Guarantee for Tender Security (*when this option is chosen*)
PW3 - 7	Bank's Letter of Commitment for Line of Credit (*when this option is chosen*)
	Contract Forms
PW3 – 8	Notification of Award
PW3 – 9	Contract Agreement
PW3 – 10	Bank Guarantee for Performance Security (*when this option is chosen*)
PW3 –11	Bank Guarantee for Advance Payment (*if applicable*)
PW3 –12	Bank Guarantee for Retention Money Security (*when this option is chosen*)
PW3 –13	Non-Disclosure Agreement

Forms **PW3-1** to **PW3 -7** comprises part of the Tender Format and should be completed as stated in ITT Clauses 24.

Forms **PW3-8** to **PW3 -12** comprises part of the Contract as stated in GCC Clause 6.

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Tender Submission Letter (Form PW3-1)

[This letter should be completed and signed by the Authorised Signatory on the Letter-Head Pad of the Tenderer]

To: *[Contact Person]* *[Name of the Procuring Entity]* *[Address of the Procuring Entity]*	Date:
Invitation for Tender No:	*IFT No.* _____
Tender Package No:	*Package No.* _____
Lot No: (*when applicable*)	*Lot No.* _____

We, the undersigned, tender to execute in conformity with the Tender Document, the following Works and physical services, viz:

In accordance with ITT Clause 27and 28, the following price applies to our Tender:

The Tender price is: (ITT Sub Clause 27.4 and 28.1)	Tk._____ *[in figures]* Taka_____ *[in words]*
The advance payment (when applicable) is: *[insert the amount based on percentage of the Tender Price]* (GCC Sub Clause 73.1)	Taka_____ *[in words]* Taka_____ *[in words]*

and we shall accordingly submit an Advance Payment Guarantee in the format shown in Form **PW3–10.**

In accordance with ITT Sub Clauses 27.6, the following discounts shall apply to our Tender:	
The unconditional discount proposed in this package/Lot is:	In Percentage(%).----------
The discount shall be equally applicable on all the items of BOQ after arithmetical correction.	

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In signing this letter, and in submitting our Tender, we also confirm that:

(a) our Tender shall be valid for the period stated in the Tender Data Sheet (ITT Sub Clause 33.1) and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(b) a Tender Security is attached in the form of a *[state Pay Order, Bank Draft, Bank Guarantee]* in the amount stated in the Tender Data Sheet (ITT Sub Clause 36.1) and valid for a period of twenty-eight (28) days beyond the Tender Validity date;

(c) if our Tender is accepted, we commit to furnishing a Performance Security within the time stated under ITT Sub Clause 66.2 in the amount stated in the Tender Data Sheet (ITT SubClauses65.1) and in the form specified in the Tender Data Sheet(ITT Sub Clause 66.1) valid for a period of twenty-eight (28) days beyond the date of issue of the Completion Certificate of the Works;

(d) we have examined and have no reservations to the Tender Document, issued by you on *[insert date];*including Addendum to Tender Document No(s) [*state numbers*] , issued in accordance with the Instructions to Tenderers (ITT Clause 11). *[insert the number and issuing date of each addendum; or delete this sentence if no Addendum has been issued];*

(e) we, including as applicable, any JV partner or Subcontractor for any part of the contract resulting from this Tender process, have nationalities from eligible countries, in accordance with ITT Sub Clause 5.1;

(f) we are submitting this Tender as a sole Tenderer in accordance with ITT Sub Clause 40.3

or

we are submitting this Tender as the partners of a JV, comprising the following other partners in accordance with ITT Sub Clause 40.3*;*

	Name of Partner	Location & District of Partner
1		
2		
3		
4		

(g) *we are not a Procuring Entity owned entity as defined in ITT Sub Clause 5.or*
we are a Procuring Entity owned entity, and we meet the requirements of ITT Sub Clause 5.10;

(h) we, including as applicable any JV partner, declare that we are not associated, nor have been associated in the past, directly or indirectly, with a consultant or any other entity that has prepared the design, specifications and other documents
in accordance with ITT Sub Clause 5.6;

(i) we, including as applicable any JV partner or Subcontractor for any part of the contract resulting from this Tender process, have not been declared ineligible by the Procuring Entity of Bangladesh on charges of engaging in corrupt, fraudulent, collusive or coercive practices in accordance with ITT Sub Clause 5.7;

(j) furthermore, we are aware of ITT Clause 4 concerning such practices and pledge not to indulge in such practices in competing for or in executing the Contract;

(k) we intend to subcontract an activity or part of the Works, in accordance with ITT Sub Clause 19.1, to the following Subcontractor(s);

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Activity or part of the Works	Name of Subcontractor with Location and District

(l) we, including as applicable any JV partner, confirm that we do not have a record of poor performance, such as abandoning the works, not properly completing contracts, inordinate delays, or financial failure as stated in ITT Clause 5.8, and that we do not have, or have had, any litigation against us, other than that stated in the Tenderer Information (**Form PW3-2**);

(m) we are not participating as Tenderer in more than one Tender in this Tendering process. We understand that your written Notification of Award shall constitute the acceptance of our Tender and shall become a binding Contract between us, until a formal Contract is prepared and executed;

(n) we, including as applicable any JV partner, confirm that we do not have a record of insolvency, receivership, bankrupt or being wound up, our business activities were not been suspended, and it was not been the subject of legal proceedings in accordance with ITT Sub Clause 5.9;

(o) we, including as applicable any JV partner, confirm that we have fulfilled our obligations to pay taxes and social security contributions applicable under the relevant national laws and regulations of Bangladesh in accordance with ITT Sub Clause 5.5;

(p) we understand that you reserve the right to reject all the Tenders or annul the Tender proceedings, without incurring any liability to Tenderer, in accordance with ITT Clause 60.

Signature:	*[insert signature of authorised representative of the Tenderer]*
Name:	*[insert full name of signatory with National ID Number]*
In the capacity of:	*[insert capacity of signatory]*
Duly authorised to sign the Tender for and on behalf of the Tenderer	

[If there is more than one (1) signatory, or in the case of a JV, add other boxes and sign accordingly].
Attachment 1:
[ITT Sub Clause 40.3]
Written confirmation authorising the above signatory(ies) to commit the Tenderer

[and, if applicable]
Attachment 2:
[ITT Sub Clause 29.2(b)]
Copy of the JV Agreement / Letter of Intent to form JV with draft proposed Agreement

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Tenderer Information (Form PW3-2)

[This Form should be completed only by the Tenderer, preferably on its Letter-Head Pad]

Invitation for Tender No: *IFT No]*

Tender Package No: *[Package No]*

Lot No (*when applicable*) *[Lot No)]*

1.	Eligibility Information of the Tenderer [ITT –Clauses 5& 29]	
1.1	Nationality of individual or country of registration	
1.2	Tenderer's legal title	
1.3	Tenderer's registered address	
1.4	Tenderer's legal status *[complete the relevant box]*	
	Proprietorship	
	Partnership	
	Limited Liability Concern	
	Procuring Entity -owned Enterprise	
	Others [please describe, if applicable]	
1.5	Tenderer's year of registration	
1.6	Tenderer's authorised representative details	
	Name	
	National ID number	
	Address	
	Telephone / Fax numbers	
	e-mail address	
1.7	Litigation [ITT Cause 13]	

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	A. No pending litigation ☐[if no pending litigation put Tick Mark in Box]			
	B. Pending litigation			
	Year	Matter in dispute	Value of Pending Claim in Taka	Value of Pending Claim as Percentage of Net Worth

1.8	Tenderer to attach photocopies of the original documents mentioned aside	[All documents required under ITT Clauses 5 and 29]
The following two information are applicable for National Tenderers		
1.9	Tenderer's Value Added Tax Registration (VAT) Number	
1.10	Tenderer's Tax Identification Number(TIN)	
[The foreign Tenderers, in accordance with ITT Sub Clause 5.1, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]		

2.	Qualification Information of the Tenderer [ITT Clause32]			
2.1	General Experience in Construction Works of Tenderer [State years of experience]			
2.2	Specific Experience in Construction Works of Tenderer Completed Contracts of similar nature, complexity and methods/construction technology			
	Contract No Name of Contract	[insert reference no] of [insert year] [insert name]		
	Role in Contract *[tick relevant box].*	Prime Contractor	Subcontractor	Management Contractor
	Award date Completion date Total Contract Value	[insert date] [insert date] [insert amount]		
	Procuring Entity's Name Address Tel / Fax e-mail Brief description with justifications of the similarity compared to the Procuring Entity's requirements	[state justification in support of its similarity compared to the proposed works]		
2.3	Average annual construction turnover [ITT Sub Clause15.1(a)]			

	[total certified payments received for contracts in progress or completed under public sector for a period as stated under ITT Sub Clause 15.1(a), using rate of exchange at the end of the period reported]		
	Year	Currency	Amount Taka or Equivalent Taka

2.4	Liquid assets available to meet the construction cash flow [ITT Sub Clause 15.1(b)]		
	No	Source of Financing	Amount Available

In order to confirm the above statements the Tenderer shall submit , as applicable, the documents mentioned in ITT Sub Clause 32.1(d)

2.5	Contact Details [ITT Sub Clause 32.1 (h)]			
	Name, address, and other contact details of Tenderer Bankers and other Procuring Entity(s) that may provide references, if contacted by this Procuring Entity			
2.6	Qualifications and experience of key technical and administrative personnel proposed for Contract administration and management [ITT Sub Clause 32.1(f)]			
	Name	Position	Years of General Experience	Years of Specific Experience

[*Tenderer to complete details of as many personnel as are applicable.Each personnel listed above should complete the Personnel Information (Form PW3-5*)]

2.7	Major Construction Equipment proposed to carry out the Contract [ITT Sub Clause 32.1(g)]		
	Item of Equipment	Condition (new, good, average, poor)	Owned, leased or to be purchased (state owner, lessor or seller)

[Tenderer to list details of each item of major construction equipment, as applicable]

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JV Partner Information (Form PW3-3)

[This Form should be completed by each JV partner].

Invitation for Tender No: *[IFT No]*

Tender Package No: *Package No]*

Lot No. (*when applicable*) *[Lot No)]*

1.	Eligibility Information of the JV Partner [ITT –Clauses 5 & 29]	
1.1	Nationality of individual or country of registration	
1.2	JV Partner's legal title	
1.3	JV Partner's registered address	
1.4	JV Partner's legal status *[complete the relevant box]*	
	Proprietorship	
	Partnership	
	Limited Liability Concern	
	Procuring Entity -owned Enterprise	
	Others [please describe, if applicable]	
1.5	JV Partner's year of registration	
1.6	JV Partner's authorised representative details	
	Name	
	National ID number	
	Address	
	Telephone / Fax numbers	
	e-mail address	

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1.7	Litigation [ITT Cause 13]			
	A. No pending litigation ☐[if no pending litigation put Tick Mark in Box]			
	B. Pending litigation			
	Year	Matter in dispute	Value of Pending Claim in Taka	Value of Pending Claim as Percentage of Net Worth

1.8	JV Partner to attach photocopies of the original documents mentioned aside	[All documents required under ITT Clauses 5 and 29]
The following two information are applicable for national JV Partners only		
1.9	JV Partner's Value Added Tax Registration (VAT) Number	
1.10	JV Partner's Tax Identification Number(TIN)	
[The foreign JV Partners, in accordance with ITT Sub Clause 5.1, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]		

2. Key Activity(ies) for which it is intended to be joint ventured, if it can be specified [ITT Sub Clause 18.2]

	Elements of Activity	Brief description of Activity

3. Qualification Information of the JV Partners[ITT Clause 32]

3.1	General Experience in Construction Works of JV Partners[State years of experience]			
3.2	Specific Experience in Construction Works of JV Partners Completed Contracts of similar nature, complexity and methods/construction technology			
	Contract No Name of Contract	[insert reference no] of [insert year] [insert name]		
	Role in Contract *[tick relevant box].*	Prime Contractor	Subcontractor	Management Contractor
	Award date Completion date Total Contract Value	[insert date] [insert date] [insert amount]		
	Procuring Entity's Name Address Tel / Fax			

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	e-mail Brief description with justifications of the similarity compared to the Procuring Entity's requirements	[state justification in support of its similarity compared to the proposed works]

3.3	Average annual construction turnover [ITT Sub Clause15.1(a)] *[[total certified payments received for contracts in progress or completed under public sector for a period as stated under ITT Sub Clause 15.1(a), using rate of exchange at the end of the period reported]]*		
	Year	Currency	Amount Taka or Equivalent Taka

3.4	Liquid assets available to meet the construction cash flow [ITT Sub Clause 15.1(b)]		
	No	Source of Financing	Amount Available

In order to confirm the above statements the JV Partners shall submit , as applicable, the documents mentioned in ITT Sub Clause 32.1(d)

3.5	Contact Details [ITT Sub Clause 32.1 (h)]
	Name, address, and other contact details of JV Partner's Bankers and other Procuring Entity(s) that may provide references, if contacted by this Procuring Entity

3.6	Qualifications and experience of key technical and administrative personnel proposed for Contract administration and management [ITT Sub Clause 32.1(f)]			
	Name	Position	Years of General Experience	Years of Specific Experience

[JV Partners *to complete details of as many personnel as are applicable.Each personnel listed above should complete the Personnel Information (Form PW3-5*)]

3.7	Major Construction Equipment proposed to carry out the Contract [ITT Sub Clause 32.1(g)]		
	Item of Equipment	Condition (new, good, average, poor)	Owned, leased or to be purchased (state owner, lessor or seller)

[Tenderer to list details of each item of major construction equipment, as applicable]

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Subcontractor Information (Form PW3-4)

[This Form should be completed by each Subcontractor, preferably on its Letter-Head Pad]

Invitation for Tender No:	*[IFT No]*
Tender Package No	*[Package No]*
Lot No. (*when applicable*)	*[Lot No]*

1.	Eligibility Information of the Subcontractor [*ITT –Clauses 5& 29]*	
1.1	Nationality of Individual or country of Registration	
1.2	Subcontractor's legal title	
1.3	Subcontractor's registered address	
1.4	Subcontractor's legal status *[complete the relevant box]*	
	Proprietorship	
	Partnership	
	Limited Liability Concern	
	Procuring Entity -owned Enterprise	
	Other (please describe)	
1.5	Subcontractor's year of registration	
1.6	Subcontractor's authorised representative details	
	Name	
	Address	
	Telephone / Fax numbers	
	e-mail address	
1.7	Subcontractor to attach copies of the following original documents	All documents to the extent relevant toITT Clause 5 and 29 in support of its qualifications
The following two information are applicable for national Subcontractors		
1.8	Subcontractor's Value Added Tax Registration (VAT) Number	
1.9	Subcontractor's Tax Identification Number(TIN)	
[The foreign Subcontractors , in accordance with ITT sub Clause 5.1, shall provide evidence by a written declaration to that effect to demonstrate that it meets the criterion]		

2. Key Activity(ies) for which it is intended to be Subcontracted [ITT Sub Clause 19.1]			
2.1	Elements of Activity	Brief description of Activity	
2.2	List of Similar Contracts in which the proposed Subcontractor had been engaged		
	Name of Contract and Year of Execution		
	Value of Contract		
	Name of Procuring Entity		
	Contact Person and contact details		
	Type of Work performed		

Personnel Information (Form PW3-5)

[This Form should be completed for each person proposed by the Tenderer in Form PW3-2 & PW3-3, where applicable]

Invitation for Tender No:	*[IFT No]*
Tender Package No	*[Package No]*
Lot No. (*when applicable*)	*[Lot No]*

A.	**Proposed Position** (tick the relevant box)		
☐	Construction Project Director	☐ Prime Candidate	☐ Alternative Candidate
☐	Key Personnel	☐ Prime Candidate	☐ Alternative Candidate
B.	**Personal Data**		
Name			
Date of Birth			
Years overall experience			
National ID Number			
Years of employment with the Tenderer			
Professional Qualifications: 1.			
C.	**Present Employment** *[to be completed only if not employed by the Tenderer]*		
Name of Procuring Entity (working under):			
Address of Procuring Entity (working under):			
Present Job Title:			
Years with present Procuring Entity:			
Tel No:		Fax No:	e-mail address:
Contact *[manager/personnel officer]:*			

D.	**Professional Experience**		
Summarise professional experience over the past twenty years, in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.			
	From	To	Company / Project / Position / Relevant technical and management experience.
1			
2			

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Invitation for Tender No: *IFT No]*

Tender Package No: *[Package No]*

Lot No (*when applicable*) *[Lot No)]*

Date of IFT Publication:

Name of the Tenderer:

[Note: If the Tenderer is a JV, each partners of the JV (Lead & Others) have to fill the form separately]

Name of JV Partner (If the tender is JV):

Business Share of JV Partner:

Role in JV [Lead/other]:

(A) List of Successfully Completed Contract during the last 5 years from IFT Date under the organization of the Procuring Entity inviting tender:

SL No	Name of Works Contract	Value of works Contract	Date of actual completion
1			
2			
3			

(B) List of On-Going Works / Current Commitment Under any Organization:

SL No	Name of On-Going Works and Current Commitments	Value of the work	Date of Signing Contract	Date of completion of contract	Name of Organization
1					
2					
3					

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Tenderer's Capacity Information (Form PW3-5B)

Invitation for Tender No: *IFT No]*

Tender Package No: *[Package No]*

Lot No (*when applicable*) *[Lot No)]*

Date of IFT Publication:

Name of the Tenderer:

[Note: If the Tenderer is a JV, each partners of the JV (Lead & Others) have to fill the form separately]

Name of JV Partner (If the tender is JV):

Business Share of JV Partner:

Role in JV [Lead/other]:

List of certified payment for ongoing or Completed Contract under any Procuring Entity Organization for the year in which maximum value of work performed within 5 years from IFT Date.

SL No	Name of Works contract	Value of Contract	Date of Signing Contract	Date of completion of contract
1				
2				
3				
4				

Bank Guarantee for Tender Security (Form PW3-6)

[This is the format for the Tender Security to be issued by any scheduled Bank of Bangladesh in accordance with ITT Clause 35 & 36]

Invitation for Tender No: Date:

Tender Package No:

Lot No (*when applicable*)
To:

[Name and address of the Procuring Entity**]**

TENDER GUARANTEE No: [insert number**]**

We have been informed that *[name of Tenderer]* (hereinafter called "the Tenderer") intends to submit to you its Tender dated *[date of Tender]* (hereinafter called "the Tender") for the execution of the Works of *[description of works]* under the above Invitation for Tenders (hereinafter called "the IFT").

Furthermore, we understand that, according to your conditions, the Tender must be supported by a Bank Guarantee for Tender Security.

At the request of the Tenderer, we *[name of Bank]* hereby irrevocably unconditionally undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of Tk *[insert amount in*

figures and words] upon receipt by us of your first written demand accompanied by a written statement that the Tenderer is in breach of its obligation(s) under the Tender conditions, because the Tenderer:

a. has withdrawn its Tender after opening of Tenders but within the validity of the Tender Security; or
b. refused to accept the Notification of Award (NOA) within the period as stated under ITT; or
c. failed to furnish Performance Security within the period stipulated in the NOA; or
d. refused to sign the Contract Agreement by the time specified in the NOA; or
e. did not accept the correction of the Tender price following the correction of the arithmetic errors as stated under ITT.

This guarantee will expire

(a) if the Tenderer is the successful Tenderer, upon our receipt of a copy of the Contract Agreement signed by the Tenderer or a copy of the Performance Security issued to you in accordance with the ITT; or
(b) if the Tenderer is not the successful Tenderer, twenty-eight (28) days after the expiration of the Tenderer's Tender Validity period, being *[date of expiration of the Tender Validity plus twenty-eight (28) days].*

Consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Signature Signature

Letter of Commitment for Bank's Undertaking for Line of Credit (Form PW3-7)

[This is the format for the Credit Line to be issued by any scheduled Bank of Bangladesh in accordance with ITT Clause 32.1(d)]

Invitation for Tender No: Date:

Tender Package No:

Lot No (*when applicable*)
To:

[*Name and address of the Procuring Entity*]

CREDIT COMMITTMENT No: [insert number]

We have been informed that *[name of Tenderer]* (hereinafter called "the Tenderer") intends to submit to you its Tender (hereinafter called "the Tender") for the execution of the Works of *[description of works]* under the above Invitation for Tenders (hereinafter called "the IFT").

Furthermore, we understand that, according to your conditions, the Tenderer's Financial Capacity i.e. Liquid Asset must be substantiated by a Letter of Commitment of Bank's Undertaking for Line of Credit.

At the request of, and arrangement with, the Tenderer, we *[name and address of the Bank]* do hereby agree and undertake that [*name and address of the Tenderer*] will be provided by us with a revolving line of credit, in case awarded the Contract, for execution of the Works viz.[*insert name of works*], for an amount not less than BDT[*in figure*] (*in words*) for the sole purpose of the execution of the above Contract. This Revolving Line of Credit will be maintained by us until issuance of "**Taking-Over Certificate**" by the Procuring Entity.

In witness whereof, authorised representative of the Bank has hereunto signed and sealed this Letter of Commitment.

Signature Signature

Notification of Award (Form PW3-8)

Contract No: Date:
To:

[Name of Contractor]

This is to notify you that your Tender dated *[insert date]* for the execution of the Works for *[name of project/Contract]* for the Contract Price of Tk *[state amount in figures and in words]*, as corrected and modified in accordance with the Instructions to Tenderers, has been approved by *[name of Procuring Entity].*

You are thus requested to take following actions:

i. accept in writing the Notification of Award within seven (7) working days of its issuance in accordance with ITT Clause 64

ii. furnish a Performance Security in the form as specified and in the amount of Tk *[state amount in figures and words]* ,within fourteen (14) days of acceptance of this Notification of Award but not later than *(specify date),* in accordance with ITT Clause 65 & 66.

iii. sign the Contract within twenty-eight (28)days of issuance of this Notification of Award but not later than *(specify date),* in accordance with ITT Clause 70.

You may proceed with the execution of the Works only upon completion of the above tasks. You may also please note that this Notification of Award shall constitute the formation of this Contract which shall become binding upon you.

We attach the draft Contract and all other documents for your perusal and signature.

Signed

Duly authorised to sign for and on behalf of *[name of Procuring Entity]*

Date:

Contract Agreement (Form PW3-9)

THIS AGREEMENT made the *[day]* day of *[month][year]* between *[name and address of Procuring Entity]* (hereinafter called "the Procuring Entity") of the one part and *[name and address of Contractor]* (hereinafter called "the Contractor") of the other part:

WHEREAS the Procuring Entity invited Tenders for certain works, viz, *[brief description of works]* and has accepted a Tender by the Contractor for the execution of those works in the sum of Taka *[Contract Price in figures and in words]* (hereinafter called "the Contract Price").

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

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

2. The documents forming the Contract shall be interpreted in the following order of priority:

   (a) the signed Contract Agreement
   (b) the Notification of Award
   (c) the completed Tender and the Appendix to the Tender
   (d) the Particular Conditions of Contract
   (e) the General Conditions of Contract
   (f) the Technical Specifications
   (g) the General Specifications
   (h) the Drawings
   (i) the priced BOQ and the Schedules
   (j) any other document listed in the **PCC** forming part of the Contract.

3. In consideration of the payments to be made by the Procuring Entity to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Procuring Entity to execute and complete the works and to remedy any defects therein in conformity in all respects with the provisions of the Contract.

4. The Procuring Entity hereby covenants to pay the Contractor in consideration of the execution and completion of the works and the remedying of defects therein, 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.

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

	For the Procuring Entity	For the Contractor
Signature		

Name

National ID No.
Title

In the presence of Name

Address

Bank Guarantee for Performance Security (Form PW3-10)

[This is the format for the Performance Security to be issued by any scheduled Bank of Bangladesh in accordance with ITT Clause 65, 66, 67 & 68]

Contract No: [insert reference number] Date: [insert date]

To:

[insert Name and address of Procuring Entity]

PERFORMANCE GUARANTEE No: [insert number]

We have been informed that *[name of Contractor]* (hereinafter called "the Contractor") has undertaken, pursuant to Contract No *[insert reference number of Contract]* dated *[insert date of Contract]* (hereinafter called "the Contract"), the execution of works *[description of works]* under the Contract.

Furthermore, we understand that, according to your conditions, the Contract must be supported by a Bank Guarantee for Performance Security.

At the request of the Contractor, we *[name of Bank]* hereby irrevocably unconditionally undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of Tk *[insert amount in figures and in words]* upon receipt by us of your first written demand accompanied by a written statement that the Contractor is in breach of its obligation(s) under the Contract conditions, without you needing to prove or show grounds or reasons for your demand of the sum specified therein.

This guarantee is valid until *[date of validity of guarantee]*, consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Signature Signature

[This is the format for the Advance Payment Guarantee to be issued by any scheduled Bank of Bangladesh in accordance with GCC Clause 73]

Contract No: [insert reference number] Date: [insert date]

To:

[insert Name and address of the Procuring Entity]

ADVANCE PAYMENT GUARANTEE No: [insert number]

We have been informed that *[name of Contractor]* (hereinafter called "the Contractor") has undertaken, pursuant to Contract No *[insert reference number of Contract]* dated *[insert date of Contract]* (hereinafter called "the Contract"), the execution of works *[description of works]* under the Contract.

Furthermore, we understand that, according to your Conditions of Contract under GCC Clause 75, the Advance Payment on Contract must be supported by a Bank Guarantee.

At the request of the Contractor, we *[insert name of Bank]* hereby irrevocably unconditionally undertake to pay you, without cavil or argument, any sum or sums not exceeding in total an amount of Tk *[insert amount in figures and in words]* upon receipt by us of your first written demand accompanied by a written statement that the Contractor is in breach of its obligation(s) under the Contract conditions, without you needing to prove or show grounds or reasons for your demand of the sum specified therein.

We further agree that no change, addition or other modification of the terms of the Contract to be performed, or of any of the Contract documents which may be made between the Procuring Entity and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee is valid until *[insert date of validity of guarantee]*, consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Signature Signature

Bank Guarantee for Retention Money Security(Form PW3-12)

[This is the format for the Retention Money Guarantee to be issued by any scheduled Bank of Bangladesh in accordance with GCC Clause 70]

Demand Guarantee

[Bank's Name, and Address of Issuing Branch or Office]

Beneficiary: [insert Name and Address of the Procuring Entity]

Date: [insert date]

RETENTION MONEY GUARANTEE No.: [insert number]

We have been informed that [insert name of Contractor] (hereinafter called "the Contractor") has entered into Contract Number [insert reference number of the Contract] dated [insert date] with you, for the execution of [insert name of Contract and brief description of Works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment, payment of Tk. [insert the amount of the second half of the Retention Money] which becomes due after the Defects Liability Period has passed and certified in the form of Defects Correction Certificate, is to be made against a Retention Money Guarantee.

At the request of the Contractor, we [insert name of Bank] hereby irrevocably unconditionally undertake to pay you any sum or sums not exceeding in total an amount of Tk. [insert amount in figures] (Taka [insert amount in words]) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor failed to properly correct the defects duly notified in respect of the Works.

It is a condition for any claim and payment under this guarantee to be made that the payment of the second half of the Retention Money referred to above must have been received by the Contractor on its account number[insert A/C no] at [name and address of Bank].

This guarantee is valid until [insert the date of validity of Guarantee that being twenty-eight (28) days beyond the Defects Liability Period]. Consequently, we must receive at the above-mentioned office any demand for payment under this guarantee on or before that date.

Signature Signature

Non-Disclosure Agreement (Form PW3-13)

NON-DISCLOSURE AGREEMENT

This mutual non-disclosure agreement (the "Agreement") is made and entered on..... (the "Effective Date") of the Christian Era and is entered into by and between:

(A) THIS AGREEMENT made the _____ between **BENGAL HOTELS AND RESORTS LIMITED (BHRL)** represented by, its Managing Director, Humayun Kabir Bablu and having their office at, Bengal House- 75 Gulshan Avenue, Dhaka-1212, Bangladesh (hereinafter called “the Client”) of the FIRST PART.

AND

B) ……..Company registered I and incorporated under the laws of Bangladesh, and having its registered office at Bangladesh, duly represented by its Designation _____
(hereinafter referred to as the "Bidder" or "OEM" or "Second Party" which expression shall unless repugnant to the context or meaning thereof shall be deemed to include its legal representative, successor in interest, administrator, executors, permitted assignee/s) of the SECOND PART.

(BHRL and _____) are collectively referred to as the "Parties" and each individually referred to as a "Party", for the purpose of this agreement,)

Background

BHRL and along with concern OEM (original equipment manufacturer) will be working together in connection with implementation _____of Solutions.

About the Purpose, it will be necessary for certain confidential information to be disclosed between the parties. BHRL and agree that the following terms and conditions shall apply when one party discloses confidential information

_____

to the other party under this Agreement. The objective of this Agreement is to provide appropriate protection for such information whilst maintaining the parties' ability to conduct their respective businesses.

1. Definitions

In this Agreement the following terms sha ll have the following meanings:

"Affiliate" means any entity which from time to time controls, is controlled by or is under common control with the relevant party, where control means having the ability (including without limitation by means of a majority of voting rights or the right to appoint or remove a majority of the board of directors) to control the management and policies of an entity.

"Confidential Information" means any information disclosed by or on behalf of one party to the other party, which (i) if disclosed in tangible form is marked confidential or (ii) if disclosed otherwise than in tangible form is confirmed in writing as being confidential or (iii) if disclosed in tangible form or otherwise, is manifestly confidential.

"Disclosing Party" means the party to this Agreement disclosing the Confidential Information.

"Receiving Party" means the party to this Agreement to whom the Confidential Information is disclosed.

2 Supply and Use of Information

2.1 In consideration of the disclosures contemplated by, and of the respective obligations set out in, this Agreement, the Receiving Party agrees, save as otherwise expressly permitted by this Agreement:

2.1.1 To keep the Disclosing Party's Confidential Information, confidential;

2.1.2 Not to use the Disclosing Party's Confidential Information except in connection with the Purpose; and

2.1.3 Not to disclose the Disclosing Party's Confidential Information to any third party.

2.2 In the case of Confidential Information that is disclosed only orally, the Disclosing Party shall, within seven days after such disclosure, deliver to the Receiving Party a brief written description of such Confidential Information; identifying the place and date of such oral disclosure and the names of the representatives of the Receiving Party to whom such disclosure was made. It is expected that such information will bear a legend or label of "Confidential" or other similar designation manifesting intent that the information is confidential.

2.3 Each party confirms that it and its Affiliates have the right to disclose any Confidential Information that they provide to the other under this Agreement.

2.4 BHRL confirms that the Confidential Information to be shared by Bank with and other _____ partners, shall primarily be known only to any one or more of the levels, within the organization, as indicated below: -

2.4.1 Senior Management i.e. Board of Directors to Head of the Departments;

2.4.2 Middle Management i.e. Senior Managers to Managers; and

2.4.3 Junior Management i.e. Associate Managers and below.

3 Confidentiality

3.1 It is hereby agreed that the discretion applied at the time of disclosure would provide the best protection of Confidential Information of either patty. Accordingly, the Disclosing Party shall ensure that only such Confidential Information which serves the Purpose shall be disclosed to the Receiving Party.

3.2 The Receiving Party shall protect the Confidential Information of the Disclosing Party through the exercise of the precautions set out in this Agreement and with no less protection and care than it customarily uses in preserving and safeguarding its own confidential information.

3.3 The Receiving Party agrees that it shall keep the Confidential Information of the Disclosing Party confidential in accordance with the terms of this Agreement subject to the exceptions in clause 3.4 below, and the permitted disclosures in clause 3.5 below.

3.4 This Agreement shall not apply to Confidential Information which:

3.4.1 is in or enters the public domain other than as a result of a breach of an obligation by the Receiving Party under this Agreement; or

3.4.2 is or has been acquired from a other third party who owes no obligation of confidence in respect of the information; or

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3.4.3 is or has been independently developed by the Receiving Party or was known to it prior to receipt; or

3.4.4 The Disclosing Party discloses to any person or entity without confidentiality restrictions.

3.5 Notwithstanding clause 2.1 above, the Receiving Party may disclose any Confidential Information of the Disclosing Party in the following circumstances:

3.5.1 with the prior written consent of the Disclosing Party; or

3.5.2 on a need-to-know basis, internally within the Receiving Party's organization; or

3.5.3 to its insurers or legal advisers in relation to any actual, potential or threatened dispute in connection with this Agreement; or

3.5.4 to the extent such disclosure is required by any court of competent jurisdiction, or by a governmental or regulatory authority, or a professional body to which Disclosing party or their respect where there is a legal duty, requirement or professional obligation

practicable (and without breaching any legal, regulatory or professional requirement) the Receiving Party gives prior prompt notice in writing to the Disclosing Party of such disclosure.

4 Term & Termination

Upon signature by all the parties, this Agreement shall come into effect from the Effective Date and shall continue in full force and effect until termination, subject to the Service Agreement (if any) between the parties, in relation to the Purpose, which includes obligations relating to the protection of the parties' confidential information. Either Party may terminate this Agreement upon 30 (Thirty) days' written notice of such termination to the other Party without assigning any reason. The Receiver's obligation with respect to confidentiality shall survive for a period of 5 (Five) years from the expiry or earlier termination of this Agreement.

5 General

5.1 No delay by either party in enforcing any of the terms or conditions of this Agreement shall affect or restrict that party's rights and powers arising under this Agreement. No waiver or amendment of any term or condition of this Agreement will be effective unless made in writing and signed by both parties.

5.2 Subject to the Service Agreement (if any), this Agreement forms the entire agreement between the parties relating to Confidential Information disclosed in connection with the Purpose and it replaces and supersedes any previous proposals, correspondence, understandings or other communications whether written or oral relating to the subject matter hereof.

5.3 If any provision of this Agreement is determined to be invalid in whole or in part, the remaining provisions shall continue in full force and effect as if this Agreement had been executed without the invalid provision.

5.4 We warrant that we are acting as principal in this matter and not as agent or broker for any person, company, or firm.

Deltadesh Pvt. Ltd. Dhaka

5.5 The Parties shall not directly or indirectly assign or transfer by operation of law or otherwise any rights or obligations under this Agreement, without the prior written consent of the other Party.

6 Governing law and Jurisdiction

This Agreement shall be governed by and construed in accordance with Bangladesh laws without reference to the conflicts of laws principles and any dispute arising from it shall be subject to the exclusive jurisdiction of the Bangladesh courts.

7 Injunctive Relief

The parties agree that a breach of any of the promises or agreements contained herein may result in irreparable and continuing damage to the Disclosing Party for which there may be no adequate remedy at law, and the parties agree that in the event of such a breach, each shall be entitled to injunctive relief and/or a decree for specific performance, and such other relief as may be proper.

8 Dispute Resolution

All disputes relating to the terms and conditions of this Agreement shall be settled amicably between the Parties within 30 days of communication of the matter in dispute. If the amicable settlement fails or that 30 days period expires without any settlement then the matter shall be referred to Arbitrators, one to be appointed by each party and such arbitrators shall appoint an umpire before they enter into any reference in the dispute. The decision of the Arbitrators and in cash of their difference that of the Umpire shall be final and binding on the parties. The Arbitration proceeding shall be conducted under the Arbitration Act, 2001 (as amended), the venue of such arbitration processing shall be held in Dhaka, Bangladesh.

The parties have caused this Agreement to be executed by their duly authorized representatives, and made effective from the Effective
Date first written above.

SIGNED for and on behalf of: BHRL

Signature:

Name:

Title:

Witness:

Deltatech Pvt. Ltd. Dhaka

Signature:

Name:

Title:

SIGNED for and on behalf of: -
Company Name

Signature: _____

Name:

Title:

Witness:

Signature: _____

Name:

Title

RECOMMENDED LIST OF MANUFACTURERS FOR FACADE SYSTEM

Equipment	Brand
Insulated Tempered Glass	SAINT GOBAIN/SYP/CSG/ XYG/Equivalent
Laminated Tempered Glass	SAINT GOBAIN/SYP/CSG/ XYG/Equivalent
Aluminum Alloy Profile	
	Guangmei -China Wacang, China Xingfa, China Chung Hua, China JMA Aluminum, China Or, equivalent
Silicone	
	Dow Corning, USA Baiyun, China Sikasil, Switzerland Synthax, UK Silflex, UK Decent, UK ANTAS, China SILANDE, China Or, equivalent
Hardware accessories	
	KINLONG, China 3H, China Or, equivalent
Royal Bolt	Hilti, Robust, USA Or, equivalent
Stainless Steel Patch Fitting	SS 304
Aluminum Composite Panel	
	Alucoil, Spain Stackbond, Spain ALPOLIC, Japan Alucobond, Germany Alcopanel, Korea Globond, China Willstrong, India Husilong, China Longdu, China Meikaier, China Or, equivalent
Glass Spacer Tape	Lohmen, Germany 3M, USA Norton, USA Or, equivalent

Deltatech Pvt. Ltd. Dhaka

SECTION-11: LIST OF DEVIATION

Project:

Client:

Ref	As Per Tender Requirement	As per offer
A	B	C

SECTION-12: TECHNICAL SPECIFICATION

ACCOR

Acoustics

Technical Document

Version 0 – June 2019

RAFFLES \ ORIENT EXPRESS \ BANYAN TREE \ DELANO \ SOFITEL LEGEND \ FAIRMONT \ SLS \ SO \ SOFITEL \ THE ORIGINALS
RIXOS \ MANTIS \ MGALLERY \ 21C \ ART SERIES \ MONDRIAN \ PULLMAN \ SWISSÔTEL \ ANGSANA \ 25HOURS HOTELS
HYDE \ MÖVENPICK \ GRAND MERCURE \ PEPPERS \ THE SEBEL \ MANTRA \ NOVOTEL \ MERCURE \ ADAGIO
MAMASHELTER \ TRIBE \ BREAKFREE \ IBIS \ IBIS STYLES \ IBIS BUDGET \ JO&JOE \ HOTELF1

General Requirements

The Environment and The Guest Experience

Nothing says quality like quiet. Therefore, with the guest experience in mind, there are four main goals the design team must address from the onset of the project:

1. Design guest rooms that are aesthetically pleasing while providing privacy, safety and a calming environment, which encourages guests to feel relaxed and comfortable so that they enjoy their stay and are more apt to return.
2. Design multi-purpose meeting spaces with acoustical environment and speech intelligibility levels appropriate for meetings and receptions, both large and small, where a variety of communication styles can be effectively used and the sense of intimacy between presenter and audience can be experienced.
3. Design food and beverage spaces that create a comfortable and safe environment for diners and employees, free of distractions from kitchen noise, outdoor noise and noise from nearby conversations.
4. Design a soothing, peaceful and calm environment for a true spa experience, without distracting noise from adjacent spaces, from one treatment room to another and from external noise sources (such as street traffic).

In order to achieve these goals, there are several noise/vibration control and acoustics-related issues that must be addressed, regardless of the size of the property being designed.

These include, but are not limited to:

— noise transmission between guest rooms

— poor speech intelligibility in meeting spaces

— mechanical noise from HVAC elements

— elevator vibration in guest room and meeting spaces

— plumbing noise

— external noise from adjacent roads and/or airport, etc.

While the perceived unwanted sound and vibration varies, these are typically a result of airborne or structure-borne transmission. Regardless of the source of noise/vibration and the transmission method, three main approaches (listed in order of cost-effectiveness) are commonly used to mitigate noise and vibration:

1. Control at the noise source location,
2. Modify the transmission path,
3. Control at the listener.

The cost/benefit of each approach must be carefully considered by the design team with guidance from the project acoustical consultant.

The fundamentals of good acoustics are well understood for many years, but the challenge remains to harness the physics of sound in the service of architecture.

This section has the following objectives:

— Provide a set of performance parameters to be adopted by the design team at the onset of the project.

— Provide practical design guidelines specific for each of the disciplines that are most affected by acoustics and noise/vibration issues – architecture, interior design, mechanical, electrical, plumbing and structural.

— Provide generic details that can be adapted and incorporated in the design documents as appropriate.

This section was written with the understanding that a bona fide acoustical consultant, member of the National Council of Acoustical Consultants or similar association, will be engaged as part of the design team for the entire duration of the project.

Acoustics Design Criteria

1. Building Envelope

Curtain Wall

The design of curtain walls must ensure that internal noise levels associated with road traffic, railways and aircraft do not exceed figures on Table 1.

HOTEL SPACE	DESIGN RANGE $L_{Aeq,T}$(DB)
Lobby and Circulation	35 ~ 40
Food and Beverage	40 ~ 50
Retail	45 ~ 55
Pre-function	40 ~ 45
Ballrooms	30 ~ 35
Meeting Rooms	30 ~ 35
Boardrooms	30 ~ 35
Guest rooms	30 ~ 35
Guest Corridors	40 ~ 45
SPA Treatment Rooms	30 ~ 35
Administrative Offices	45 ~ 50
Heart-of-House Areas	45 ~ 55

Table 1 – Internal noise limits due to exterior noise sources.

2. Public Areas

Lobby and Circulation Spaces

Design Considerations

Since the design of the hotel entrance must welcome and inspire guests and creating a memorable sense of arrival and departure, noise and vibration levels must be controlled accordingly.

Finish material selection shall take into account the need to achieve a balance between sound absorptive, reflective and diffusive surfaces and match the guest visual experience with appropriate room acoustics.

Mechanical Noise Criteria

Noise levels associated with mechanical, electrical and plumbing systems shall not exceed RC35~40(N) or NC35~40.

Airborne Sound Isolation Criteria

External walls shall be designed to ensure that internal noise levels do not exceed LAeq,T35~40.

Internal walls between Lobby and Heart-of-House areas shall provide airborne sound isolation equivalent to NIC50 or better.

Internal walls between Lobby and food and beverage spaces shall provide airborne sound isolation equivalent to NIC50 or better.

The project acoustical consultant shall advise the design team on the appropriate wall and door types required to meet the applicable transmission requirements.

Impact Noise Criteria

Although unlikely, when lobby and circulation areas are above meeting spaces and/or guest rooms, impact noise isolation must be at least IIC65.

Vibration Isolation Criteria

Mechanical isolation systems shall be designed by the project acoustical consultant to ensure that both vertical and horizontal vibration dose value (VDV) levels experienced in the lobby areas due to operation of building services equipment will not exceed 0.4m/s1.75.

Reverberation Time

The average reverberation time (RT60) between 500 and 2000 Hertz shall be 1.5 seconds or less.

Food and Beverage Spaces

Design Considerations

Considering that the Food and Beverage spaces shall provide an active dining experience for hotel guests and visitors from surrounding communities, the flexible, inviting and comfortable ambience created by the design team must be complemented with appropriate noise and vibration control features.

Finish material selection shall take into account the need to achieve a balance between sound absorptive, reflective and diffusive surfaces and match the guest visual experience with appropriate room acoustics.

The project acoustical consultant shall verify that the interior design will allow for guest conversations at normal levels while background noise build-up is kept at minimum and a minimum of privacy is maintained.

Mechanical Noise Criteria

Noise levels associated with mechanical, electrical and plumbing systems shall not exceed RC35~40(N) or NC35~40.

Airborne Sound Isolation Criteria

External walls shall be designed to ensure that internal noise levels do not exceed LAeq,T 40~50.

Internal walls between food and beverage spaces and Heart-of-House areas shall provide airborne sound isolation equivalent to NIC50 or better.

Internal walls between food and beverage spaces and lobby/circulation spaces shall provide airborne sound isolation equivalent to NIC50 or better.

The project acoustical consultant shall advise the design team on the appropriate wall and door types required to meet the applicable transmission requirements.

Impact Noise Criteria

Although unlikely, when are above meeting spaces and/or guest rooms, impact noise isolation must be at least IIC65.

Vibration Isolation Criteria

Mechanical isolation systems shall be designed by the project acoustical consultant to ensure that both vertical and horizontal vibration dose value (VDV) levels experienced in the guest areas due to operation of building services equipment will not exceed 0.4m/s1.75.

Reverberation Time

The average reverberation time (RT60) between 500 and 2000 Hertz shall be 1.2 seconds or less.

Retail Spaces

Design Considerations

Acoustical requirements for retail spaces are intended to provide guests with a level of acoustical comfort that is consistent with other areas of the hotel.

Mechanical Noise Criteria

Noise levels associated with mechanical, electrical and plumbing systems shall not exceed RC35~40(N) or NC35~40.

Airborne Sound Isolation Criteria

Walls between retail spaces and public circulation areas spaces shall provide airborne sound isolation equivalent to NIC45 or better.

The project acoustical consultant shall advise the design team on the appropriate wall and door types required to meet the applicable transmission requirements.

Impact Noise Criteria

Retail spaces located above meeting spaces, Spa treatment rooms and other noise sensitive areas shall require impact noise isolation of at least IIC65.

Ballrooms

Design Considerations

Proper room acoustics and low background noise levels are crucial elements for the success of the events taking place in these flexible spaces; without them the sense of intimacy between presenter and audience cannot be experienced and effective communication is compromised. Thus, the design of Ballroom spaces shall result in an acoustical environment and speech intelligibility levels appropriate for business meetings and conferences where variety of communication styles can be effectively used, as well as social functions for multiple groups of varying sizes.

Mechanical Noise Criteria

Noise levels associated with mechanical, electrical and plumbing systems shall not exceed RC30~35(N) or NC30~35.

Airborne Sound Isolation Criteria

If any of the Ballroom perimeter walls are external walls, these shall be designed to ensure that internal noise levels do not exceed LAeq,T 30~35.

Internal walls between Ballroom and Heart-of-House areas shall provide airborne sound isolation equivalent to NIC54 or better.

Internal walls between Ballroom and pre-function areas spaces shall provide airborne sound isolation equivalent to NIC54 or better.

The project acoustical consultant shall advise the design team on the appropriate permanent wall and door types required to meet the applicable transmission requirements.

Ballroom operable partitions shall be manually operated and have a sound isolation performance equivalent to NIC50 or better.

The manufacturer shall provide field performance guarantee. Compliance with isolation requirements must be field verified by the project acoustical consultant.

Impact Noise Criteria

In the unlikely scenario where Ballroom are located above meeting spaces or other noise sensitive areas, impact noise isolation must be at least IIC65.

Vibration Isolation Criteria

Mechanical isolation systems shall be designed by the project acoustical consultant to ensure that both vertical and horizontal vibration dose value (VDV) levels experienced within the Ballroom(s) due to operation of building services equipment will not exceed 0.4 m/s1.75.

Reverberation Time

The average reverberation time (RT60) between 500 and 2000 Hertz shall be between 0.8 and 1.2 seconds when all operable partitions are stored.

For each individual salon, RT60 between 500 and 2000 Hertz shall not exceed 1.2 seconds.

Speech Intelligibility

Speech intelligibility for all possible Ballroom configurations shall be equivalent to STI 0.7 or better.

The project acoustical consultant shall verify compliance with this requirement in-situ (for unoccupied spaces) using standards-based measurements for RaSTI (Rapid Speech Transmission Index) and STI-PA (Speech Transmission Index for Public Address).

The project acoustical and AV consultants shall collaborate to ensure that the combination of suitable room acoustics and a properly designed sound reinforcement system will provide the required speech intelligibility levels.

Privacy Criteria

The Privacy Index (PI) for ballrooms shall be 95% or higher which corresponds to an Articulation Index (AI) of 0.05 or lower.

Pre-function Spaces

Design Considerations

Since the Ballroom pre-function area must be designed as an extension of the main Ballroom, then all acoustical requirements for Ballroom (item above) apply.

Meeting Rooms

Design Considerations

Although meeting rooms are intended to accommodate small groups, the importance of proper acoustical environment and speech intelligibility is basically the same as for ballrooms.

Mechanical Noise Criteria

For meeting rooms intended to accommodate video conference requirements, noise levels associated with mechanical, electrical and plumbing systems shall not exceed RC20~25(N) or NC20~25. For all other meetings rooms, mechanical noise levels shall not exceed RC25~30(N) or NC25~30.

Airborne Sound Isolation Criteria

If any of the meeting room perimeter walls are external walls, these shall be designed to ensure that internal noise levels do not exceed LAeq,T 30~35.

Internal walls between meeting rooms and Heart-of-House areas shall provide airborne sound isolation equivalent to NIC54 or better.

Internal walls between meeting rooms and pre-function areas spaces shall provide airborne sound isolation equivalent to NIC54 or better.

Demising walls between adjacent meeting rooms and/or boardrooms shall provide airborne sound isolation equivalent to NIC54 or better.

The project acoustical consultant shall advise the design team on the appropriate wall and door types required to meet the applicable transmission requirements.

Impact Noise Criteria

For meeting rooms located above meeting spaces or other noise sensitive areas, impact noise isolation must be at least IIC65.

Vibration Isolation Criteria

Mechanical isolation systems shall be designed by the project acoustical consultant to ensure that both vertical and horizontal vibration dose value (VDV) levels experienced within the ballroom(s) due to operation of building services equipment will not exceed 0.4 m/s1.75.

Reverberation Time

The average reverberation time (RT60) between 500 and 2000 Hertz shall be between 0.6 and 0.8 second.

Speech Intelligibility

Speech intelligibility shall be equivalent to STI 0.7 or better.

The project acoustical consultant shall verify compliance with this requirement in-situ (for unoccupied spaces) using standards-based measurements for RaSTI (Rapid Speech Transmission Index) and STI-PA (Speech Transmission Index for Public Address).

The project acoustical and AV consultants shall collaborate to ensure that the combination of suitable room acoustics and a properly designed sound reinforcement system will provide the required speech intelligibility levels.

Privacy Criteria

The Privacy Index (PI) for meeting rooms shall be 95% or higher which corresponds to an Articulation Index (AI) of 0.05 or lower.

Boardrooms

Design Considerations

Boardrooms shall provide function spaces for executive meetings. Similar to meetings rooms, proper room acoustics and low background noise levels are crucial elements for effective communication. These elements become even more important when meetings include remote attendees via audio and/or video-conference.

Mechanical Noise Criteria

Considering that Boardrooms are intended to accommodate video conference requirements, noise levels associated with mechanical, electrical and plumbing systems shall not exceed RC20~25(N) or NC20~25.

Airborne Sound Isolation Criteria

If any of the boardroom perimeter walls are external walls, these shall be designed to ensure that internal noise levels do not exceed LAeq,T 30~35.

Internal walls between Boardrooms and heart-of-house areas shall provide airborne sound isolation equivalent to NIC54 or better.

Internal walls between meeting rooms and pre-function areas spaces shall provide airborne sound isolation equivalent to NIC54 or better.

Demising walls between adjacent Boardrooms and/or meeting rooms shall provide airborne sound isolation equivalent to NIC54 or better.

The project acoustical consultant shall advise the design team on the appropriate wall and door types required to meet the applicable transmission requirements.

Impact Noise Criteria

For Boardrooms located above meeting spaces or other noise sensitive areas, impact noise isolation must be at least IIC65.

Vibration Isolation Criteria

Mechanical isolation systems shall be designed by the project acoustical consultant to ensure that both vertical and horizontal vibration dose value (VDV) levels experienced within the Boardrooms(s) due to operation of building services equipment will not exceed 0.4 m/s1.75.

Reverberation Time

The average reverberation time (RT60) between 500 and 2000 Hertz shall be between 0.6 and 0.8 second.

Speech Intelligibility

Speech intelligibility shall be equivalent to STI 0.7 or better.

The project acoustical consultant shall verify compliance with this requirement in-situ (for unoccupied spaces) using standards-based measurements for RaSTI (Rapid Speech Transmission Index) and STI-PA (Speech Transmission Index for Public Address).

The project acoustical and AV consultants shall collaborate to ensure that the combination of suitable room acoustics and a properly designed sound reinforcement system will provide the required speech intelligibility levels.

Privacy Criteria

The Privacy Index (PI) for Boardrooms shall be 95% or higher which corresponds to an Articulation Index (AI) of 0.05 or lower.

3. Guest Room Areas

Guest rooms

Design Considerations

The acoustical experience required to complement the “Rest and Recover” guest room concept is a combination of low levels of mechanical noise and vibration and a high degree of airborne sound and impact isolation. The end result is a calming environment, with proper degree of privacy and acoustical comfort, which is essential for a restful unforgettable and guest experience.

Mechanical Noise Criteria

Guest room noise levels due to the operation of the HVAC system shall not exceed RC30(N) / NC30 when the unit is operating at low speed, or RC35(N) / NC35 at medium speed.

Airborne Sound Isolation Criteria

External walls shall be designed to ensure that internal noise levels do not exceed LAeq,T 30~35.

Internal walls between Guest rooms, public corridors, elevator shafts and heart-of-house areas shall provide airborne sound isolation equivalent to NIC52 or better.

Particular attention must be given to interconnecting doors between guest rooms so that the resulting acoustical performance of wall/door combination is not compromised.

The project acoustical consultant shall advise the design team on the appropriate permanent wall and door types required to meet the applicable transmission requirements.

The project acoustical consultant shall perform field testing to confirm compliance of the selected partition(s) during the model room evaluation process.

Impact Noise Criteria

For stacked Guest rooms, impact noise isolation must be at least NIC65.

Vibration Isolation Criteria

Mechanical isolation systems shall be designed by the project acoustical consultant to ensure that both vertical and horizontal vibration dose value (VDV) levels experienced in the Guest room due to operation of building services equipment will not exceed 0.4 m/s1.75.during daytime and 0.2 m/s1.75 during night-time.

Reverberation Time

The average reverberation time (RT60) between 500 and 2000 Hertz shall be 0.8 second or less.

Privacy Criteria

The Privacy Index (PI) for Guest rooms shall be 80% or higher which corresponds to an Articulation Index (AI) of 0.2 or lower.

NOTE: *It is important to provide a high level of sound attenuation to ensure guest privacy. All walls between Guest rooms, public corridors, elevator shafts, service areas and Heart-of-House areas shall have a minimum NIC 52 or better.*

— Impact noise isolation for stacked Guest rooms must be NIC65 or better.

— Mechanical noise should be within the limits of the applicable Noise Criteria on Section - Mechanical Systems.

— Disguise access panels, electrical closets and similar devices.

— All exposed grilles, diffusers, sprinkler escutcheons, speakers, etc. shall be factory painted to match adjacent surface as per designers' specifications. Paint all guest facing ductwork behind grilles and diffusers flat black.

— Paint type shall be low or no VOC.

Acoustical spray-on ceilings or acoustical tile ceilings are not permitted in guest areas.

Corridors and Related Areas

Design Considerations

Comments are applicable to guest room circulation, public elevator lobbies, mechanical/electrical closets, and ice machine rooms.

Mechanical Noise Criteria

Noise levels associated with mechanical, electrical and plumbing systems shall not exceed RC35~40(N) or NC35~40.

Airborne Sound Isolation Criteria

Internal walls between guest rooms, guest corridors and related areas shall provide airborne sound isolation equivalent to NIC52 or better.

The project acoustical consultant shall advise the design team on the appropriate permanent wall and door types required to meet the applicable transmission requirements.

Impact Noise Criteria

For stacked guest room corridors, impact noise isolation must be at least NIC58.
Vibration Isolation Criteria

Mechanical isolation systems shall be designed by the project acoustical consultant to ensure that both vertical and horizontal vibration dose value (VDV) levels experienced in the guest corridors and adjacent areas due to operation of building services equipment will not exceed 0.4 m/s1.75.during daytime and 0.2 m/s1.75 during night-time.

4. Spa & Fitness Areas

Treatment Rooms

Mechanical Noise Criteria

Noise levels associated with mechanical, electrical and plumbing systems shall not exceed RC30~35(N) or NC30~35.

Airborne Sound Isolation Criteria

Internal walls between treatment rooms and circulation corridors shall provide airborne sound isolation equivalent to NIC52 or better.

The project acoustical consultant shall advise the design team on the appropriate permanent wall and door types required to meet the applicable transmission requirements.

Impact Noise Criteria

For treatment rooms located above treatment spaces or other noise sensitive areas, impact noise isolation must be at least IIC65.

Vibration Isolation Criteria

Mechanical isolation systems shall be designed by the project acoustical consultant to ensure that both vertical and horizontal vibration dose value (VDV) levels experienced within the Spa treatment rooms due to operation of building services equipment will not exceed 0.4 m/s1.75.

Reverberation Time

The average reverberation time (RT60) between 500 and 2000 Hertz shall be 0.8 second or less.

Exercise Rooms

Mechanical Noise Criteria

Noise levels associated with mechanical, electrical and plumbing systems shall not exceed RC40~45(N) or NC40~45.

Airborne Sound Isolation Criteria

Internal walls between exercise rooms, circulation corridors, and noise sensitive spaces shall provide airborne sound isolation equivalent to NIC52 or better.

Impact Noise Criteria

For exercise rooms located above noise sensitive areas of the hotel, impact noise isolation must be at least IIC65. A floating floor may be required to meet this requirement. The project acoustical consultant shall specify appropriate solution and advise the design team accordingly.

Vibration Isolation Criteria

Mechanical isolation systems shall be designed by the project acoustical consultant to ensure that both vertical and horizontal vibration dose value (VDV) levels experienced within the exercise rooms due to operation of building services equipment will not exceed 0.4 m/s1.75.

5. Heart Of House Areas

Office Areas

Mechanical Noise Criteria

Noise levels associated with mechanical, electrical and plumbing systems shall not exceed RC40~45(N) or NC40~45.

Airborne Sound Isolation Criteria

Partitions between executive offices, perimeter walls of offices adjoining public areas, washrooms adjoining offices, Director of Human Resources, and HR interview room shall provide airborne sound isolation equivalent to NIC48 or better. All other partitions shall provide airborne sound isolation equivalent to NIC42 or better.The project acoustical consultant shall advise the design team on the appropriate permanent wall and door types required to meet the applicable transmission requirements.

Impact Noise Criteria

Office spaces located above guest rooms and other noise sensitive areas of the hotel, impact noise isolation must be at least IIC65.

Laundry

Design Considerations

While laundry facilities are typically installed on grade, and surrounded by non-sensitive areas, care must be taken to ensure that airborne and structure-borne transmission to noise sensitive areas is adequately reduced.

All large washer/extractors units should be equipped with internal suspension systems to reduce vibration transmission to the structure during extraction mode.

Standard noise control practices should be observed when installing the laundry equipment. These include de-coupling all plumbing from the structure, sealing properly any penetration in walls or to the slab above, and using flexible connections between the laundry equipment and related pipes or fixtures.

Laundry chutes shall be mechanically isolated from the floor slabs and surrounding walls to minimize noise transmission to adjacent rooms.

Airborne Sound Isolation Criteria

Perimeter walls shall provide airborne sound isolation equivalent to NIC48 or better.

Loading Dock

Design Considerations

Due to the loading and unloading operations taking place at the loading dock at different times of the day, noise levels associated with such activities can | be disrupting.

The project acoustical consultant shall advise the design team on the most favourable loading dock location to minimise noise transmission to guest rooms and function spaces.

Service Corridors

Mechanical Noise Criteria

Noise levels associated with mechanical, electrical and plumbing systems shall not exceed RC40~50(N) or NC40~50.

Airborne Sound Isolation Criteria

Partitions between service corridors and public areas shall provide airborne sound isolation equivalent to NIC52 or better.

The project acoustical consultant shall advise the design team on the appropriate permanent wall and door types required to meet the applicable transmission requirements.

Impact Noise Criteria

Service corridors located above meeting spaces and other noise sensitive areas of the hotel, impact noise isolation must be at least IIC65

Acoustic Design Matrix

	MECHANICAL NOISE CRITERIA	AIRBORNE SOUND ISOLATION CRITERIA			IMPACT NOISE CRITERIA	VIBRATION ISOLATION CRITERIA	REVERBERATION TIME	SPEECH INTELLIGIBILITY	PRIVACY CRITERIA
		EXTERNAL WALLS	INTERNAL WALLS	OTHER PARTITION					
	DO NOT EXCEED	DO NOT EXCEED	EQUIVALENT OR BETTER	EQUIVALENT OR BETTER	AT LEAST	DO NOT EXCEED	RT60 BETWEEN 500 AND 2000 HERTZ	EQUIVALENT OR BETTER	
PUBLIC AREAS									
Lobby and Circulation Spaces	RC35~40(N) or NC35~40	LAeq,T 35~40	NIC50 or better		IIC65	VDV 0.4m/ s1.75	1.5 seconds or less		
Food and Beverage Spaces	RC35~40(N) or NC35~40	LAeq,T 40~50	NIC50 or better		IIC65	VDV 0.4m/ s1.75	1.2 seconds or less		
Retail Spaces	RC35~40(N) or NC35~40		NIC45 or better		IIC65				
Ballrooms	RC30~35(N) or NC30~35	LAeq,T 30~35	NIC54 or better	NIC50 or better	IIC65	VDV 0.4m/ s1.75	between 0.8 and 1.2	STI 0.7	PI 95% or higher Equal to AI of 0.05 or lower
Meeting Rooms	AV rooms RC20~25(N) or NC20~25 All Others RC25~30(N) or NC25~30	LAeq,T 30~35	NIC54 or better	NIC54 or better	IIC65	VDV 0.4m/ s1.75	between 0.6 and 0.8 second	STI 0.7	PI 95% or higher Equal to AI of 0.05 or lower
Board Rooms	RC20~25(N) or NC20~25	LAeq,T 30~35	NIC54 or better		IIC65	VDV 0.4m/ s1.75	between 0.6 and 0.8 second	STI 0.7	PI 95% or higher Equal to AI of 0.05 or lower

	MECHANICAL NOISE CRITERIA	AIRBORNE SOUND ISOLATION CRITERIA			IMPACT NOISE CRITERIA	VIBRATION ISOLATION CRITERIA	REVERBERATION TIME	SPEECH INTELLIGIBILITY	PRIVACY CRITERIA
		EXTERNAL WALLS	INTERNAL WALLS	OTHER PARTITION					
	DO NOT EXCEED	DO NOT EXCEED	EQUIVALENT OR BETTER	EQUIVALENT OR BETTER	AT LEAST	DO NOT EXCEED	RT60 BETWEEN 500 AND 2000 HERTZ	EQUIVALENT OR BETTER	
GUEST ROOMS AREAS									
Guest room	HVAC low speed RC30(N) / NC30 HVAC medium speed RC35(N) / NC35	LAeq,T 30~35	NIC52 or better		NIC65	VDV 0.4m/ s1.75 Daytime VDV 0.2m/ s1.75 Night-time	0.8 second or less		PI 80% or higher Equal to AI of 0.2 or lower
Corridors and Related Areas	RC35~40(N) or NC35~40		NIC52 or better		NIC58	VDV 0.4m/ s1.75 Daytime VDV 0.2m/ s1.75 Night-time			
SPA & FITNESS AREAS									
Treatment Rooms	RC30~35(N) or NC30~35		NIC52 or better		IIC65	VDV 0.4m/ s1.75	0.8 second or less		
Exercise Rooms	RC40~45(N) or NC40~45		NIC52 or better		IIC65	VDV 0.4m/ s1.75			
HEART OF HOUSE AREAS									
Office Areas	RC40~45(N) or NC40~45		NIC48 or better	NIC42 or better	IIC65				
Laundry			NIC48 or better						
Loading Dock									
Service Corridors	RC40~50(N) or NC40~50		NIC52 or better		IIC65				

Noise & Vibration Control Guidelines

1. Architecture

Space Planning

In order to complement the “design to enable” concept, effective space planning is key to eliminate the majority of noise concerns at a much lower costs (and with much better results) when compared to remedial work for issues unaddressed during design.

By addressing architectural acoustics and noise and vibration control early in the design process, hotel guest spaces can be comfortable and productive places to rest and work. Therefore, the design team should avoid locating sensitive areas such as guest rooms and meeting spaces adjacent to potentially noisy areas such as mechanical rooms. When that is not feasible, the project acoustical consultant should be involved in the process to recommend possible noise/vibration control strategies and related costs and benefits.

Curtain Wall

The project acoustical consultant shall conduct a study to determine the expected noise levels at the project site and offer noise mitigating strategies that will keep noise levels within the limits defined herein while keeping the project costs within budget.

Building orientation in relation to the noise source(s), noise barriers, etc., should be considered before relying entirely on the curtain wall to block all unwanted sounds. Once the degree of isolation is established, curtain walls shall be designed based on OITC (Outdoor-Indoor Transmission Class) performance instead of STC (Sound Transmission Class). OITC is a better acoustical indicator for this purpose since it is determined based on a spectrum shape that is an average of three typical spectra from transportation sources (aircraft take off, freeway, and railroad pass by), while STC is only accurate for speech sounds and not recommended for amplified music, mechanical equipment noise, transportation noise or any sound with substantial low- frequency energy below 125 Hz.

Interior Walls

In order to provide the required sound transmission loss between adjacent noise sensitive spaces and/or between quiet and noisy areas, the following guidelines shall be observed:

- Run all gypsum board layers vertically, with no joints except at the studs.
- Stagger joints of gypsum board layers a minimum of 305mm (12 inches) apart where multiple layers occur; tape outer joints only.
- Caulk all partition types as per details provided in this section.
- Install all electrical power, light switches, AV, data and telephone outlet boxes in separate stud spaces, and seal as shown on detail provided.
- Mechanically isolate all piping running inside partitions from the wall structure; use resilient wrapping and low durometer rubber hoses to break potential vibration paths.
- At locations where a pipe penetrates a wall assembly, keep the size of the hole to a minimum, but under no circumstance shall the pipe make physical contact with the wall construction. Fill the space around the pipe with a resilient material and caulk so that there is a complete seal between the pipe and the wall construction.

— Provide constant field supervision during installation to ensure that integrity of the acoustically rated assembly is maintained and expected performance is achieved.

Operable Partitions

Operable partitions shall be manually operated because

— higher STC rated door assemblies are not motorised

— motorised assemblies do jam and when that happens it takes at least a few days to repair

— servicing motorised chain-operated partitions typically results in damaging the acoustical isolation between rooms which is left unrepaired

Ballroom operable partitions shall be top supported with individually suspended rolling panels (each equipped with two trolleys); floor tracks are not allowed.

Partition tracks should be steel, not aluminium - steel tracks can be used to accommodate temporary track hangers for AV equipment.

The track detailing must include a true acoustic isolation wall above the track to the slab above with no unsealed penetrations.

The partition panels shall be stored in a concealed enclosure. The partition storage pocket doors must not be relied upon to provide acoustical separation. Instead, seal the partition to the rear of pocket at continuous solid blocking to avoid flanking transmission.

The far end seal must be an extrusion; the door should not simply place a bulb seal against a wall. Block far-end seals/extrusions to avoid bowing.

Top and bottom seals must be mechanically operated; drag seals must be avoided.

Pass doors in operable wall partitions are to be avoided since they compromise acoustic isolation effectiveness.

Neither NIC nor STC based criteria include sound transmission below 125Hz. Therefore, while the NIC50 requirement presented herein is adequate for operable partitions in small to mid-size ballrooms, larger spaces need to receive a differential treatment by the project acoustical

Consultant

Larger spaces can typically be combined to accommodate two large events concurrently – each event requiring sound reinforcement levels not required in small to mid-size ballrooms. Additional loudspeakers (including subwoofers) are used in conjunction with (our in lieu of) the house sound system in order to achieve such levels. Since the quantity and location of such transducers varies widely, the project acoustical consultant needs to determine the additional sound attenuation required so that one event does not interfere with the other.

While a high-attenuation performance single partition can be used, a double-partition configuration using standard panels should be considered and a case-by-case cost analysis should be performed.

Interior Finishes

In order to meet speech intelligibility requirements, room finishes for meeting spaces must be carefully selected to achieve an acoustical environment that matches the visual experience.

The minimum treatment consists of acoustical panels installed from ~1 to 3 meters (42 to 120 inches) above finished floor (AFF) and cover 50~60% of available permanent wall surfaces. Operable partitions should be covered with sound absorptive fabric (specially designed for this application) that is easy to clean and replace.

Acoustical modelling shall be performed by the project acoustical consultant to help the design team achieving a proper balance between sound absorption and diffusion.

Airborne Isolation Criteria Summary

HOTEL SPACE	PARTITION TYPE	NIC
Lobby and Circulation	Perimeter walls	50+
Food and Beverage	Perimeter walls	50+
Kitchen	Perimeter walls	50+
Retail	Perimeter walls	45+
Pre-function	Perimeter walls	54+
Ballrooms	Perimeter walls	54+
Ballrooms	Walls above operable partition track	50+
Ballrooms (§)	Operable partitions	50+
Meeting Rooms	Perimeter walls	54+
Boardrooms	Perimeter walls	54+
Guest rooms	Party walls	52+
Guest rooms	Shaft and chase walls at bathroom	52+
Guest rooms	Elevator shaft walls	52+
Guest rooms	Corridor walls	52+
SPA	Treatment rooms perimeter walls	52+
Executive Offices	Perimeter walls	48+
Administrative Offices	Perimeter walls	42+
Heart-of-House Areas	Demising walls with function spaces	52+
Laundry	Perimeter walls	48+
Mechanical Plant	Perimeter walls	60+

Table 2 – Airborne sound isolation criteria.

2. HVAC Systems

Design Considerations

Noise and vibration associated with heating, ventilation, and air conditioning (HVAC) system have significant impact on the guest experience. Noise generated by cooling towers, chillers, pumps, fans, piping, ductwork, and terminal air devices among others, can cause building elements to vibrate and produce unwanted sound. This can be very disruptive when guests are trying to rest, have productive meetings, and collaborate with remote individuals through video conferencing.

While acoustical considerations must be made during all phases of the construction process, control of the mechanical system noise is most effective if evaluated and addressed during the early design phases. Noise and vibration control strategies implemented as retrofits after construction are expensive, disruptive and seldom meet expectations.

The quality of mechanical equipment and general construction is (typically) never better than when the building is brand new. As time passes and seals

and bearings wear, the level of background noise will increase. Thus, compromising design standards during value engineering, cost cutting, or material or method substitution processes will have a long term impact on the quality of the guest experience and the property reputation.

From an acoustical standpoint, a typical design sequence should start with the selection of quietest equipment that complies with budget and operational requirements, located away from noise sensitive areas. This needs to be complemented with proper ductwork layout, adequate air velocities at terminal devices, and mechanical isolation from the building structure.

The acoustical consultant for the project shall perform a numerical analysis (based on manufacturer-provided data for the specified equipment) to confirm that the proposed HVAC design meets the applicable criteria.

HVAC SYSTEMS — Noise Criteria Summary

HOTEL SPACE	RC / NC
Lobby and Circulation	RC35 ~ 40(N) / NC35 ~ 40
Food and Beverage	RC40 ~ 45(N) / NC40 ~ 45
Retail	RC35 ~ 40(N) / NC35 ~ 40
Pre-function	RC35 ~ 40(N) / NC35 ~ 40
Ballrooms	RC30 ~ 35(N) / NC30 ~ 35
Meeting Rooms (video conference ready)	RC25 ~ 30(N) / NC25 ~
30 Boardrooms (video conference ready)	RC25 ~ 30(N) / NC25~
30 Guest rooms	RC30 ~ 35(N) / NC30 ~ 35
Guest Corridors	RC35 ~ 40(N) / NC35 ~ 40
SPA Treatment Rooms	RC30 ~ 35(N) / NC30 ~ 35
Administrative Offices	RC40 ~ 45(N) / NC40 ~ 45
Heart-of-House Areas	RC40 ~ 50(N) / NC40 ~ 50

Recommended noise criteria for unoccupied spaces.

Diffuser Selection

Initially select supply and return air diffusers to have 5 NC points less than the space NC level. Then adjust this value downward to account for the total number of diffusers serving the space using the following factors:

— -6 dB for less than 5 diffusers

— -10 dBfor 6 to 10 diffusers

— -12dB for 11 to 15 diffusers

— -13dB for 16 to 20 diffusers

— -15dB for more than 20 diffusers

The first correction factor accounts for differences in the Air Diffusion Council test standard and typical installation conditions. The second correction factor accounts for the total sound power level associated with all of the active diffusers in the space.

Vibration Isolation

All rotating equipment should be provided with vibration isolators. The project acoustical consultant shall determine specific static deflection requirements based on the lowest equipment operating rotational speed and the floor level from which the equipment is supported or hung.

The guidelines in Tables 4 and 5 should be used for specifying static deflection for the vibration isolators.

EQUIPMENT TYPE	ISOLATOR TYPE	STATIC DEFLECTION
Vane-Axial Fans (all RPM)	Neoprene Mount	13mm (0.50”)
Centrifugal In-Line Fans (to 500 RPM)	Steel Spring Mount	32mm (1.25”)
Centrifugal In-Line Fans (> 500 RPM)	Steel Spring Mount	19mm (0.75”)
Centrifugal or Plug Fans (to 500 RPM)	Steel Spring Mount	32mm (1.25”)
Centrifugal or Plug Fans (> 500 RPM)	Steel Spring Mount	19mm (0.75”)
Utility Set Fans (to 500 RPM)	Steel Spring Mount	32mm (1.25”)
Utility Set Fans (> 500 RPM)	Steel Spring Mount	19mm (0.75”)
Chillers	Neoprene Mount	13mm (0.50”)
Cooling Towers	Restrained Spring Mount	25mm (1.00”)
Pumps	Neoprene Mount	13mm (0.50”)

Table 4 – Vibration isolation for equipment supported on floors on grade.

EQUIPMENT TYPE	ISOLATOR TYPE	STATIC DEFLECTION
Vane-Axial Fans (to 500 RPM)	Steel Spring Mount	64mm (2.50”)
Vane-Axial Fans (> 500 RPM)	Steel Spring Mount	38mm (1.50”)
Centrifugal In-Line Fans (to 500 RPM)	Steel Spring Mount	51mm (2.00”)
Centrifugal In-Line Fans (> 500 RPM)	Steel Spring Mount	38mm (1.50”)
Centrifugal or Plug Fans (to 500 RPM)	Steel Spring Mount	51mm (2.00”)
Centrifugal or Plug Fans (> 500 RPM)	Steel Spring Mount	38mm (1.50”)
Utility Set Fans (to 500 RPM)	Steel Spring Mount	38mm (1.50”)
Utility Set Fans (> 500 RPM)	Steel Spring Mount	25mm (1.00”)
Up blast Roof Exhaust Fans	Curb Mount	25mm (1.00”)
Fan Coil Units >1000 CFM	Steel Spring Mount	25mm (1.00”)
Chillers	Restrained Spring Mount	38mm (1.50”)
Cooling Towers	Restrained Spring Mount	64mm (2.50”)
Pumps	Steel Spring Mount	25mm (1.00”)

Table 5 – Vibration isolation for equipment supported on floors above grade.

Additionally, piping and ductwork connected to vibration-isolated equipment should be provided with vibration isolators as follows:

— Ductwork and Piping - Vibration Isolators with static deflection and type equal to that used for the equipment for the first three support points either side of the equipment. Beyond this, provide vibration isolators with static deflection equal to one-half the first three support points for a minimum of 12m (40 feet).

— Piping - Provide flexible couplings at suction and discharge pipe connections to pumps and chillers.

— Ductwork - Provide flexible canvas connectors, 50mm (2 inches) long minimum, between fans/air handler units and ductwork. Provide thrust restraints on vane-axial fans with TSP greater than 89mm (3.5 inches).

— Electrical connections to mechanical equipment should use flexible electrical cables.

— Wall and floor penetrations should be isolated from the building structure to prevent transmission of vibration, and to prevent leakage of sound through cracks around the penetrations. Please refer to details provided herein.

Ductwork Layout

Careful consideration to basic design guidelines is essential to insure low levels of self-generated noise and low turbulence flow. These guidelines include (but are not limited to) the following:

— Start with the quietest possible equipment.

— Locate air-handling equipment away from noise sensitive areas.

— Recommended exit airflow velocities should not be exceeded.

— Duct aspect ratio should not be more than 2.5:1

— Locate dampers downstream from air-handling equipment to reduce regenerated noise.

- Locate right-angle bends and dampers 5 to 10 diameters upstream from the outlet to reduce regenerated noise.
- Sudden changes in directions should be avoided. When not possible to avoid sudden changes, turning vanes should be used to reduce pressure loss.
- Diverging sections (branching) should be gradual – angle of divergence shall be less than 20°.
- Duct transitions should be gradual to avoid abrupt changes in volume.
- Use radius elbows where possible.
- Elbows with non-turning vanes should have a radius of three times the largest duct dimension.
- Acoustical lining (2.5cm/1in thick) should be used for both supply and returnductwork as required to achieve the applicable noise criteria, with no less than 9.1m (30 feet)from the air handling units.
- Allow for proper fan outlet conditions. For rectangular ducts, the minimum length shall be 1.5 x the largest outlet dimension; for round ducts, the minimum length shall be 1.5 x the outlet diameter.
- Straight rigid ductwork equal to three times the largest duct dimension should be used before and after sound attenuators (silencers).
- Acoustical lagging should be used around all ductwork which passes through noise-sensitive areas – a minimum of 10 pipe diameters (or 10 times the larger square duct dimension) upstream and 20 diameters (or 20 times the larger square duct dimension) downstream of all transitions, tees, valves, branch take-offs or similar to ensure laminar flow beyond the cladding.
- Do not rely on acoustical ceilings are as sound barriers; the space above a drop ceiling in an acoustically sensitive area should not be used for high velocity terminal units.
- Sound attenuator (silencer) selection must take into account the spectrum of the energy to be reduced so that the resulting noise follows the proper RC contour, avoiding overdesign.
- The project acoustical shall create source-path-receiver acoustical models to verify compliance to applicable noise criteria for all typical noise sensitive areas.

Air Velocities

The following guidelines are provided for duct sizing based on location, type and class of ductwork.

- Round ducts in mechanical rooms and shafts – <3000 fpm
- Rectangular ducts in mechanical rooms and shafts – <2500 fpm
- Ceilings above occupied spaces with mineral fibre acoustical tiles for NC35 to NC40 goal – <2000-2500 fpm
- Ceilings above occupied spaces with open or acoustically transparent ceiling for NC35 to NC40 goal – <1500-2000 fpm
- Large final distribution ducts serving NC35 to NC40 spaces – <1500-2000 fpm
- Friction rate (pressure loss rate) of 0.10 in. wg/100 ft of duct runs in smaller final duct distribution for NC-40.
- Friction rate (pressure loss rate) of 0.08 in. wg/100 ft of duct runs in smaller final duct distribution for NC-35.

Airflow velocities through net free area of duct section for NC25 and NC30 criteria are provided in tables below. It is assumed that (1) no dampers, straighteners, deflectors, equalizing grids, etc. behind terminal devices, and (2) ductwork above mineral fibre acoustical tiles. Velocities should be lowered by 20% for open or acoustically transparent ceilings.

Table 6 shall be used for lined ductwork (2.5cm/1in thick) while Table 7 shall be used for unlined ductwork.

	AIRFLOW VELOCITIES (FPM)			
	NC25		**NC30**	
DUCT ELEMENT OR DEVICE	Supply	Return	Supply	Return
Terminal device (1/2” minimum slot width)	350	420	425	510
First 8-10 ft of lined duct	420	490	510	600
Next 15-20 ft of lined duct	560	630	680	765
Next 15-20 ft of lined duct	700	800	850	970
Next 15-20 ft of lined duct	900	980	1080	1180
Next 15-20 ft of lined duct	1120	1260	1360	1540
Maximum within space	1400	1450	1700	1870

Table 6 – Recommended airflow velocities in lined duct systems.

Exterior Noise Emission

The project acoustical consultant shall conduct a comprehensive study to determine the maximum expected noise levels generated by mechanical systems installed outdoors (i.e. chiller plant, cooling towers, etc.). Based on attained results, the acoustical consultant shall prepare an assessment report for the design team addressing necessary steps to meet the project exterior noise isolation criteria and compliance with applicable local noise ordinances.

	AIRFLOW VELOCITIES (FPM)			
	NC25		**NC25**	
DUCT ELEMENT OR DEVICE	Supply	Return	Supply	Return
Terminal device (1/2” minimum slot width)	350	420	425	510
First 8-10 ft of lined duct	336	392	408	480
Next 15-20 ft of lined duct	448	504	544	612
Next 15-20 ft of lined duct	560	640	680	776
Next 15-20 ft of lined duct	720	784	864	944
Next 15-20 ft of lined duct	896	1008	1088	1232
Maximum within space	1120	1160	1360	1496

Table 6 – Recommended airflow velocities in lined duct systems.

3. Plumbing Systems

Design Considerations

Plumbing noise can be as disrupting as HVAC noise when radiating into function spaces. Turbulent flow piping noise can be caused by water or other liquids passing through elbows, valves or other transition pieces causing the pipe to vibrate. This vibration then radiates as airborne noise into the adjacent areas.

Lightweight PVC plastic pipe is now commonly used to replace cast iron, copper or mild steel tubing. Because of its lightweight (i.e. low damping, mid-high radiation efficiency) construction, PVC pipes are easily set into motion due to fluid flow, with the result being an increase in concerns and complaints directed towards noise.

Plumbing Noise Control

The following are guidelines are intended to reduce plumbing noise:

— Water velocity should not exceed 2m/s (6ft/s), and pipe sizes should be adjusted for this maximum velocity.

— Waste and water supply lines should not be installed in any walls enclosing noise sensitive spaces.

— Vertical drain pipes should not be installed within interior or on the exterior walls of noise sensitive spaces.

— The number of pipe transitions (tees, elbows, Y connections, etc.) should be kept to a minimum.

— Regulators should be installed as required to ensure that the water pressure is no greater than 344,000Pa (50pounds per square inch) in the main water supply lines.

— Water-hammer arresters should be placed close to quick-acting valves and should be installed at the end of plumbing lines over 10m (35ft) long.

— Plumbing penetrations on opposite sides of any sound-rated partition assembly should be separated by a minimum distance of 406mm (16in).

— Select plumbing valves of the ball-type which exhibit minimum noise when in use.

— Select faucets and taps with fully ported nozzles and equipped with aeration or anti-splash devices.

— Waste piping and water supply piping should be isolated from the building construction at points of contact with resilient sleeves, vibration isolators, or a minimum of 6.4mm (¼-inch) of resilient material such as soft neoprene, rubber, felt padding, etc.

Acoustical lagging over piping may be necessary when additional attenuation is required over noise sensitive areas.

4. Electrical Systems

Generator Room

While emergency generators are essential to ensure that critical building activities and life safety systems are not compromised during power outages, the associated noise and vibration can be transmitted to sensitive areas through building partitions (walls and floors), the structural system and generator ventilation systems, potentially disrupting business meetings and guest room areas.

At the early stages of the design process, consideration must be given to key factors that will determine the noise/vibration control strategies. These include generator size, generator type (gas, diesel and bi-fuel), generator room location and generator usage (emergency vs. peak shaving).

Generator noise and vibration control requirements are project specific and should be developed by the project acoustical consultant and coordinated with members of the design team.

Architectural, structural, and mechanical design considerations should include the following:

— Improved airborne sound isolation between the generator room and adjacent noise-sensitive spaces. Proper space planning can reduce noise and vibration control requirements through buffering.

— Space provision to accommodate large mufflers and silencers.

— Absorptive finishes in the generator room should be included when feasible.

— Structural support for the generator, an inertia base with two to three times the mass of the generator, and potentially a floating floor (when a slab-on-grade condition is not possible).

— Minimised floor deflections to allow efficient operation of spring isolators. Seismic requirements must also be evaluated.

— Spring vibration isolators and inertia bases with two to three times the mass of the generator is required in most applications.

— Hospital-grade silencers (or better) for combustion exhaust.

— Silencers with large cross-sectional areas to meet insertion loss requirements and accommodate low pressure drop tolerances typical of generator radiator fans.

Vibration isolation hangers and flex connection for all ductwork and piping. Resiliently suspended ceilings may be required for spaces below the generator room.

Transformer Room

Transformers, like other electromagnetic devices, produce a “hum” known as magnetostriction, which is caused by the alternating flux in the transformer core. The relative loudness depends on the construction of the transformer, the manner of installation and the ambient sound level at the site.

When transformers are not properly mounted or supported, their vibration is transmitted to the support structure and finds its way in neighbouring spaces, manifesting itself as an annoying tonal noise.

Planning of transformer placement and proper installation can significantly reduce transformer noise. Therefore, the following guidelines should be observed.

— Install transformer(s) as far as possible from areas where the sound could be objectionable.

— Avoid placing transformer(s) near multiple reflective surfaces such as in a corner, near a ceiling or floor, or in a hallway.

— Isolate the transformer core and coils from the ground or supporting structure using proper vibration isolators. Air cooled dry transformers require isolating the core and coil from its support structure. Oil filled transformers require isolating the core and coil from its tank base and isolate its tank base from the support structure.

— Use flexible conduit couplings between the transformer and the wiring system. This includes incoming cables, bus bars, stand-off insulators, etc., since any rigid connection from the vibrating transformer to a solid structure will transmit vibration.

— Mount transformer(s) on an inertia base or on a surface with the largest possible mass.

— The transformer room dimensions should not correspond to half wavelength of the transformer noise/vibration frequencies.

— The transformer room walls, ceiling, floor, and access doors shall be designed according to airborne transmission guidelines provided herein. The project acoustical consultant shall provide additional guidelines (including the use of sound absorptive materials) based on the specific equipment selected for the project.

5. Elevator Systems

Design Considerations

Noise and vibration associated with vertical transportation systems should comply with industry standard requirements for ride, comfort, and acoustics. These requirements shall be included in the specifications for the elevator systems bid package.

Noise Limits

Elevator noise shall not exceed LAeq,F 55 dB at any time during the lift cycle when measured with a Type I sound level meter at 1.5 meter (~5 feet) from the floor and 1 meter (~3.4 feet) from the door face.

Door noise shall not exceed LAeq,F 65 dB within the car when measured with a Type I sound level meter at 1.5 meters (~5 feet) from the floor and 1 meter (~3.4 feet) from the door face.

Car noise levels at maximum car velocity shall not exceed LAeq,F 55 dB for lift speeds up to 2 m/s (6.6 ft/s) and LAeq,F 60 dB for greater speeds.

Elevator ventilation system shall be turned off during all measurements.

Vibration Limits

Horizontal vibration shall not exceed RMS (root mean square) acceleration levels of 0.08m2/s (~0.26sqft/s) between 1-80 Hz inclusive in any one-third octave band.

At maximum speed, vertical vibration shall not exceed RMS acceleration levels of 0.08m2/s (~0.26sqft/s) between 1-80 Hz inclusive in any one third octave band.

During acceleration/deceleration and start/stop periods, vertical vibration shall not exceed RMS acceleration levels of 0.1m2/s (~0.33sqft/s) between 1-80 Hz inclusive in any one third octave band.

The above limits apply to lifts with speeds of 4m/s (~13.1ft/s). For lift speeds of 4-7m/s (~13.1-23ft/s), the above specified acceleration limits can each be increased by a factor of 1.5.

Vibration measurements shall be made on the floor at the centre of the car, in three mutually perpendicular axes, corresponding to vertical vibration and lateral quaking. Measurements shall be made of acceleration level in each direction over two complete cycles, one from the bottom of the building to the top, and one from the top of the building to the bottom.

References — Related Codes and Standards

American National Standards Institute (ANSI)

— ANSI S1.1-1994
American National Standard: Acoustical Terminology

— ANSI S3.29-1983
American National Standard: Guide to Evaluation of Human Exposure to Vibration in Buildings

American Society for Testing and Materials (ASTM)

— ASTM E336 – 09
Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings

— ASTM E413 – 04
Classification for Rating Sound Insulation

— ASTM E492
Standard Test Method for Laboratory Measurement of Impact Sound transmission through Floor-ceiling Assemblies using the Tapping machine

— ASTM E90
Test Method for Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions and Elements

— ASTM E966
Guide for Field Measurement of Airborne Sound Insulation of Building Facades and Facade Elements

— ASTM E989
Standard Classification for Determination of Impact Insulation Class (IIC)

— ASTM E1332 - 10a
Standard Classification for Rating Outdoor-Indoor Sound Attenuation

American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

— ASHRAE Guidelines 2003
Building Services Noise and Vibration levels

British Standards Institute (BSI)

— BS8233:1999
Sound Insulation and noise reduction for buildings – Code of practice

— BS6472-1:2008
Guide to evaluation of human exposure to vibration in buildings (0.5Hz-80Hz)

— BS4142
Rating of Industrial noise affecting mixed residential and industrial areas

Chartered Institute of Building Services Engineers

— CIBSE Guidelines 2003
Building Services Noise and Vibration levels

International Organization for Standardization (ISO)

— ISO 140-3:1995 Acoustics
Measurement of sound insulation in buildings and of building elements – Part 3: Laboratory measurement of airborne sound insulation of building elements

— ISO 140-4:1998 Acoustics
Measurement of sound insulation in buildings and of building elements – Part 4: Field measurement of airborne sound insulation of building elements

— ISO 140-5:1998 Acoustics
Measurement of sound insulation in buildings and of building elements – Part 5: Field measurement of airborne sound insulation of facade elements and façades

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ISO 140-6:1998 Acoustics
Measurement of sound insulation in buildings and of building elements – Part 6: Laboratory measurement of impact sound insulation of floors

— ISO 140-7:1998 Acoustics
Measurement of sound insulation in buildings and of building elements – Part 7: Field measurement of impact sound insulation of floors

— ISO 717-1:1997 Acoustics
Rating of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation

— ISO 717-2:1997 Acoustics
Rating of sound insulation in buildings and of building elements – Part 2: Impact sound insulation

— ISO 5821:1993 Acoustics
Rating of sound insulation in buildings and of building elements – Part 3: Airborne sound insulation

— ISO 354:2003 Acoustics
Measurement of sound absorption in a reverberation room

— ISO 11654:1997 Acoustics
Sound absorbers for use in buildings – Rating of sound absorption

— ISO 3746 Acoustics
Determination of sound power levels of noise sources using sound pressure – Survey method using an enveloping measurement surface over a reflecting plane.

— ISO 2361-2:1989 Acoustics
Evaluation of Human Exposure to Whole-Body Vibration, Part 2: Continuous and Shock-Induced Vibrations in Buildings (1-80Hz)

Australian/New Zealand Standards (AS/NZS)

— AS/NZS 2107:2000 Acoustics
Recommended design sound levels and reverberation times for building interiors

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EDGE User Guide

Version 2.1

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International Finance Corporation

E01* - REDUCED WINDOW TO WALL RATIO

Corresponds to HME01, HTE01, RTE01, OFE01, HSE01, EDE01

Requirement Summary

Window-to-Wall Ratio (WWR) should be selected and the WWR value entered in the EDGE App in all cases, irrespective of the value. Savings can be achieved if the Window to Wall Ratio is lower than the local base case as set out in the Key Assumptions for the Base Case in the Design section. EDGE will calculate the impact of any improvement beyond the base case.

Intention

The sun is the most powerful light source but is also a source of significant heat gain. Therefore, it is important to balance lighting and ventilation benefits of glazing against the impacts of heat gain on cooling needs and/or passive heating. Finding the correct balance between the transparent (glass) and the opaque surfaces in the external façades helps to maximize daylight while minimizing unwanted heat transfer, resulting in reduced energy consumption. The design goal should be to meet minimum illumination levels without significantly exceeding the solar heat gains in temperate and warm climates, as well as to make the most of passive heating in cold climates in winter time.

Windows generally transmit heat into the building at a higher rate than walls do. In fact, windows are usually the weakest link in the building envelope as glass has much lower resistance to heat flow than other building materials. Heat flows out through a glazed window more than 10 times faster than it does through a well-insulated wall. While glazed areas are desirable to admit solar radiation in cold climates during the day, windows in warmer climates can significantly increase the building's cooling loads.

Approach/Methodologies

This measure uses the Window to Wall Ratio (WWR), which is defined as the ratio of the total area of the window or other glazing area (including mullions and frames) divided by the gross exterior wall area.

The WWR is calculated with the following equation:

$$\text{WWR}\ (\%) = \frac{\sum \text{Glazing area}\ (\text{m}^2)}{\sum \text{Gross exterior wall area}\ (\text{m}^2)}$$

Glazing area is the area of glass on all façades regardless of orientation. Gross exterior wall area is the sum of the area of the exterior façades in all orientations, which includes walls, windows and doors. To calculate the exterior wall area, the interior surface of the exterior wall must be used to determine the lengths.

The actual WWR for the design case must be entered in the system. While a higher WWR may have a negative impact on energy savings, it can be compensated for by other energy saving measures.

The improved case WWR must be calculated and entered for each façade separately, i.e. for the North Façade the % WWR of the North façade only should be entered. This will impact the solar gain in each façade and impact the cooling and heating load.

For projects with multiple subprojects with multiple EDGE files, the recommended method is to calculate an average WWR for the whole building and use that in every subproject. Modeling each subproject with its own

WWR is also acceptable, but unless a significant difference exists between the subprojects with some containing double height spaces or very different glass areas, this approach is not recommended. For example, if the average WWR of a residential building is 35%, that will be used for all unit types regardless of their individual WWR. (However, individual window opening sizes will be considered for the natural ventilation measure).

Windows and walls facing internal courtyards or gaps between buildings (open to outside air) should be included in the WWR calculations.

Spandrel panels (opaque insulated glass panels) should be included as external walls in the WWR calculations.

The following examples should be excluded from the calculations of WWR:

a) Walls with windows/ventilation openings into interior shafts only (for example, as seen for bathrooms in residential projects in India)
b) Any external wall that is not directly exposed to the environment. For example, underground walls, earth-bermed walls or walls in direct contact with another building
c) Walls that do not enclose interior spaces. This includes walls that have more than 30% of the area as a permanent opening for ventilation. The next enclosing wall should be used instead.
d) Openings that are only ventilation openings (without glazing)

Potential Technologies/Strategies

A building with a higher WWR will transfer more heat than a building with a lesser WWR. If the WWR is higher than the default value, then other measures such as shading or a lower solar heat gain coefficient (SHGC) of the glass should be considered to offset the energy loss. In cold climates, when the WWR is higher than the default, the insulation of glass using double or triple glazing should be considered.

With regards to daylight, two basic strategies are available for using the sun for lighting while minimizing heat gain. The first is to use a small window opening (15% WWR) to illuminate a surface inside the space that then spreads the light out over a large area. The second is to use a moderately sized window (30% WWR) that "sees" an exterior reflective surface but is shaded from the direct sun. To increase the daylight availability, the selection of higher visible light transmittance (VLT>50) for the glass is also important.

Relationship to Other Measures

Envelope heat transfer is a function of the thermal resistance of the external materials, the area of the building façade, and the temperature difference between the exterior and interior of the building. The primary causes of heat transfer are infiltration and windows. The size, number and orientation of windows have a significant effect on the building's energy use for thermal comfort purposes (heating or cooling).

In cold climates, direct solar radiation passes through the glass during the day, passively heating the interior. If sufficient thermal mass is used, this heat is then released, helping to keep the room comfortable later in the day. In this climate type, the glass placement that is most desirable is at the elevation with the greatest exposure to sunlight. However, in warm and temperate climates, the WWR should be lower as the reduction of glass leads to a reduction in the overall cooling load and reduced need for air conditioning.

It is important to consider that lighting and cooling energy use can be reduced by the use of daylighting. This should be balanced with the corresponding solar and convective heat gains.

Assumptions

The base case for the WWR is included in the Key Assumptions for the Base Case in the Design section. The base case varies by building type, and can also vary by location. The default assumptions for the improved case for the WWR may vary from country to country. If the actual WWR is different than the default, the actual WWR value for the improved case must be entered manually.

Compliance Guidance

At the post-construction stage, it is important to ensure that the WWR has been maintained to achieve the energy savings indicated in the EDGE results. Compliance is achieved when the design team can demonstrate that the WWR in all elevations is equal or lower than the claimed specification, using the formula explained in "Potential Technologies/Strategies" above.

Design Stage	Post-Construction Stage
At the design stage, the following must be used to demonstrate compliance: · Calculation of "Glazing Area" and "Gross Exterior Wall Area" for each façade of the building and the average area weighted WWR; and · All façade elevation drawings showing glazing dimensions and general building dimensions.	At the post-construction stage, the following must be used to demonstrate compliance: · Updated WWR calculations if necessary, or confirmation that the design WWR is still valid; and, either · As-built façade drawings; or · External and internal photographs of the building showing all the elevations

E02 – EXTERNAL SHADING DEVICES

Corresponds to HME04, HTE02, RTE04, OFE04, HSE04, EDE04

Requirement Summary

This measure can be claimed if external shading devices are provided on the building's exterior.

Intention

External shading devices are provided on the building façade to protect the glazed elements (glass windows and doors) from direct solar radiation to reduce glare and to reduce radiant solar heat gain in cooling dominated climates. This method is more effective than internal shading devices such as blinds, because radiant solar gain occurs in the form of short wavelengths that can pass through glass. However, reflected wavelengths are longer and can no longer pass through glass to exit the space. This phenomenon is known as the greenhouse effect.

Approach/Methodologies

If this measure is selected, EDGE uses a default shading factor equivalent to that of a shading device that is 1/3 of the height of the window and 1/3 of the width of the window on all windows of the building. However, if shading devices are provided that are different from EDGE assumptions, then a different shading factor should be used. The shading factor varies according to the latitude and the orientation of the windows, as well as the size of the shading device, and can be calculated using the built-in calculator. Figure 7 illustrates the dimensions used to calculate the shading factor.

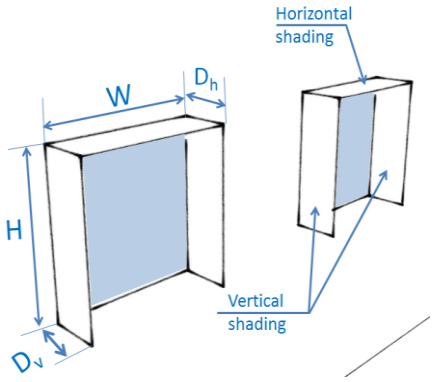


Figure 7. Illustration of the dimensions used to calculate the shading factor

Table 13, Table 14, and Table 15 show the relationship between the Dh and Dv (depth of horizontal and vertical shading) H (window height) and W (window width) to determine the shading factor.

This measure is assessed using an Annual Average Shading Factor, which is represented by one minus the ratio of solar radiation transmitted by a protected window (with external shading devices), compared to that transmitted by an unprotected window.

Annual Average Shading Factor (AASF) is defined by following equation:

$$\text{AASF} = 1 - \frac{\text{Total annual solar heat gain from a window with shading (kWh)}}{\text{Total annual solar heat gain from a window without shading (kWh)}}$$

The shading factor is expressed as a decimal value between 0 and 1. The higher the shading factor, the greater is the shading capability of the shading device.

Table 13, Table 14, and Table 15 indicate the shading factors for different orientations, latitudes, and shading device proportions. The last column of Table 15 lists the average shading factor for the combined type, which is used as the default improved case by EDGE.

The project AASF is the area-weighted average of the shading factors of all the external windows. When conducting calculations, all windows should be accounted for. If a window has a vertical and a horizontal overhang with different depths, select the more conservative (smaller factor) overhang depth for the calculation. If any windows do not have an overhang, they must still be included in the calculation and use the appropriate values for 'No Overhang.' The total Window Area must match the total External Window Area used in WWR calculations.

Table 13: Shading factors for horizontal shading devices at different latitudes for each orientation
*The shading factors have been derived using a solar modelling tool

HORIZONTAL - SHADING FACTOR* (Shading Coefficient) N (North), NE (North East), E (East), SE (South East), S (South), SW (South West), W (West), NW (North West)										
Latitude	**Shading Proportion**	**Shading Factor**								
Northern Hemisphere		**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**	**Average**
Southern Hemisphere		**S**	**SE**	**E**	**NE**	**N**	**NW**	**W**	**SW**	
0º - 9º	D_h=H/1	0.49	0.46	0.49	0.50	0.50	0.52	0.52	0.48	**0.50**
	D_h =H/2	0.44	0.39	0.39	0.40	0.46	0.43	0.41	0.41	**0.42**
	D_h =H/3	0.39	0.34	0.32	0.33	0.39	0.36	0.34	0.35	**0.35**
	D_h =H/4	0.35	0.29	0.27	0.28	0.33	0.31	0.28	0.30	**0.30**
10º - 19º	D_h=H/1	0.47	0.44	0.47	0.51	0.51	0.52	0.49	0.47	**0.48**
	D_h =H/2	0.42	0.38	0.38	0.40	0.43	0.42	0.41	0.41	**0.40**
	D_h =H/3	0.36	0.33	0.31	0.32	0.35	0.35	0.34	0.35	**0.34**
	D_h =H/4	0.32	0.29	0.26	0.27	0.30	0.30	0.30	0.32	**0.29**
20º - 29º	D_h=H/1	0.47	0.44	0.47	0.50	0.51	0.52	0.50	0.46	**0.48**
	D_h =H/2	0.41	0.38	0.37	0.39	0.41	0.41	0.40	0.41	**0.40**
	D_h =H/3	0.36	0.33	0.31	0.32	0.34	0.34	0.34	0.35	**0.33**
	D_h =H/4	0.31	0.28	0.26	0.26	0.29	0.29	0.28	0.31	**0.29**
30º - 39º	D_h=H/1	0.47	0.43	0.46	0.49	0.51	0.51	0.49	0.46	**0.48**
	D_h =H/2	0.41	0.37	0.36	0.38	0.40	0.40	0.39	0.40	**0.39**
	D_h =H/3	0.36	0.32	0.29	0.30	0.33	0.32	0.33	0.35	**0.32**
	D_h =H/4	0.31	0.28	0.25	0.25	0.28	0.27	0.28	0.31	**0.28**
40º - 49º	D_h=H/1	0.46	0.39	0.40	0.43	0.46	0.46	0.45	0.44	**0.44**
	D_h =H/2	0.40	0.34	0.31	0.33	0.36	0.36	0.37	0.39	**0.36**
	D_h =H/3	0.35	0.29	0.25	0.26	0.29	0.29	0.30	0.33	**0.30**
	D_h =H/4	0.31	0.25	0.21	0.21	0.23	0.24	0.26	0.29	**0.25**
50º - 60º	D_h=H/1	0.33	0.30	0.34	0.38	0.40	0.39	0.36	0.32	**0.35**
	D_h =H/2	0.24	0.23	0.24	0.26	0.28	0.26	0.25	0.24	**0.25**
	D_h =H/3	0.18	0.18	0.18	0.19	0.20	0.19	0.19	0.19	**0.19**
	D_h =H/4	0.15	0.14	0.14	0.15	0.16	0.15	0.15	0.15	**0.15**

Table 14: Shading factors for vertical shading devices at different latitudes for each orientation

VERTICAL - SHADING FACTOR* (Shading Coefficient) N (North), NE (North East), E (East), SE (South East), S (South), SW (South West), W (West), NW (North West)										
Latitude	Shading Proportion	Shading Factor								
Northern Hemisphere		N	NE	E	SE	S	SW	W	NW	Average
Southern Hemisphere		S	SE	E	NE	N	NW	W	SW	
0º - 9º	D_v=W/1	0.23	0.23	0.18	0.22	0.23	0.20	0.18	0.21	**0.21**
	D_v=W/2	0.21	0.19	0.15	0.18	0.22	0.17	0.15	0.18	**0.18**
	D_v=W/3	0.19	0.16	0.12	0.15	0.19	0.14	0.12	0.15	**0.15**
	D_v=W/4	0.16	0.14	0.11	0.12	0.16	0.12	0.11	0.13	**0.13**
10º - 19º	D_v=W/1	0.21	0.24	0.20	0.20	0.23	0.18	0.20	0.21	**0.21**
	D_v=W/2	0.19	0.21	0.16	0.16	0.21	0.15	0.17	0.19	**0.18**
	D_v=W/3	0.17	0.18	0.14	0.13	0.17	0.14	0.15	0.16	**0.15**
	D_v=W/4	0.15	0.16	0.12	0.11	0.15	0.12	0.13	0.15	**0.13**
20º - 29º	D_v=W/1	0.22	0.25	0.20	0.21	0.24	0.19	0.20	0.22	**0.21**
	D_v=W/2	0.19	0.21	0.16	0.17	0.20	0.16	0.17	0.19	**0.18**
	D_v=W/3	0.17	0.18	0.13	0.14	0.17	0.14	0.14	0.17	**0.15**
	D_v=W/4	0.15	0.15	0.12	0.11	0.14	0.12	0.12	0.15	**0.13**
30º - 39º	D_v=W/1	0.21	0.26	0.22	0.21	0.24	0.19	0.21	0.23	**0.22**
	D_v=W/2	0.19	0.22	0.17	0.16	0.19	0.16	0.18	0.20	**0.19**
	D_v=W/3	0.17	0.19	0.14	0.13	0.16	0.14	0.15	0.17	**0.16**
	D_v=W/4	0.15	0.16	0.12	0.11	0.14	0.11	0.13	0.15	**0.13**
40º - 49º	D_v=W/1	0.23	0.28	0.24	0.24	0.25	0.23	0.22	0.24	**0.24**
	D_v=W/2	0.20	0.23	0.19	0.17	0.20	0.18	0.19	0.21	**0.20**
	D_v=W/3	0.18	0.19	0.15	0.14	0.16	0.15	0.16	0.17	**0.16**
	D_v=W/4	0.16	0.16	0.13	0.11	0.14	0.13	0.14	0.15	**0.14**
50º - 60º	D_v=W/1	0.26	0.30	0.27	0.27	0.27	0.26	0.27	0.28	**0.27**
	D_v=W/2	0.20	0.22	0.20	0.18	0.20	0.19	0.21	0.21	**0.20**
	D_v=W/3	0.16	0.17	0.16	0.14	0.15	0.15	0.16	0.16	**0.16**
	D_v=W/4	0.13	0.14	0.13	0.11	0.12	0.12	0.13	0.13	**0.13**

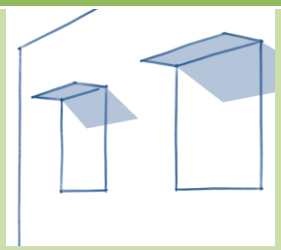
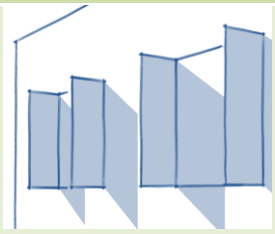
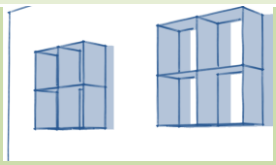
Table 15: Shading factors for combined shading devices (both horizontal and vertical) at different latitudes for each orientation

COMBINED - SHADING FACTOR (Shading Coefficient) N (North), NE (North East), E (East), SE (South East), S (South), SW (South West), W (West), NW (North West)										
Latitude	Shading proportion	Shading Factor								
Northern Hemisphere		N	NE	E	SE	S	SW	W	NW	Average
Southern Hemisphere		S	SE	E	NE	N	NW	W	SW	
0º - 9º	D_h=H/1 & D_v=W/1	0.72	0.69	0.67	0.72	0.74	0.73	0.70	0.70	**0.71**
	D_h=H/2 & D_v=W/2	0.65	0.59	0.54	0.58	0.68	0.60	0.56	0.60	**0.60**
	D_h=H/3 & D_v=W/3	0.58	0.50	0.45	0.48	0.58	0.51	0.47	0.51	**0.51**
	D_h=H/4 & D_v=W/4	0.51	0.43	0.38	0.41	0.50	0.43	0.39	0.44	**0.44**
10º - 19º	D_h=H/1 & D_v=W/1	0.69	0.69	0.67	0.71	0.74	0.70	0.70	0.68	**0.70**
	D_h=H/2 & D_v=W/2	0.60	0.59	0.54	0.56	0.64	0.57	0.59	0.60	**0.59**
	D_h=H/3 & D_v=W/3	0.53	0.51	0.45	0.45	0.53	0.49	0.50	0.52	**0.50**
	D_h=H/4 & D_v=W/4	0.47	0.45	0.39	0.38	0.45	0.42	0.43	0.46	**0.43**
20º - 29º	D_h=H/1 & D_v=W/1	0.69	0.69	0.68	0.71	0.75	0.71	0.70	0.69	**0.70**
	D_h=H/2 & D_v=W/2	0.61	0.59	0.54	0.56	0.62	0.57	0.57	0.60	**0.58**
	D_h=H/3 & D_v=W/3	0.53	0.51	0.44	0.46	0.51	0.48	0.48	0.52	**0.49**
	D_h=H/4 & D_v=W/4	0.47	0.44	0.38	0.38	0.43	0.41	0.41	0.46	**0.42**
30º - 39º	D_h=H/1 & D_v=W/1	0.69	0.69	0.68	0.71	0.75	0.70	0.70	0.69	**0.70**
	D_h=H/2 & D_v=W/2	0.60	0.59	0.53	0.55	0.60	0.56	0.57	0.61	**0.58**
	D_h=H/3 & D_v=W/3	0.53	0.51	0.44	0.44	0.49	0.47	0.48	0.52	**0.48**
	D_h=H/4 & D_v=W/4	0.47	0.44	0.37	0.36	0.41	0.39	0.41	0.46	**0.41**
40º - 49º	D_h=H/1 & D_v=W/1	0.69	0.68	0.64	0.68	0.71	0.69	0.68	0.68	**0.68**
	D_h=H/2 & D_v=W/2	0.61	0.57	0.50	0.50	0.56	0.54	0.56	0.59	**0.55**
	D_h=H/3 & D_v=W/3	0.53	0.49	0.41	0.40	0.45	0.44	0.47	0.51	**0.46**
	D_h=H/4 & D_v=W/4	0.47	0.42	0.35	0.32	0.37	0.37	0.40	0.45	**0.39**
50º - 60º	D_h=H/1 & D_v=W/1	0.62	0.63	0.63	0.66	0.68	0.66	0.65	0.62	**0.64**
	D_h=H/2 & D_v=W/2	0.53	0.51	0.48	0.48	0.51	0.49	0.51	0.53	**0.50**
	D_h=H/3 & D_v=W/3	0.43	0.42	0.38	0.37	0.39	0.38	0.41	0.43	**0.40**
	D_h=H/4 & D_v=W/4	0.36	0.34	0.31	0.29	0.31	0.30	0.34	0.36	**0.33**

Potential Technologies/Strategies

Three basic types of solar shading are used: horizontal, vertical, and combined (egg crate).

Table 16: Typical shading devices

Shading Type	Image	Description
Horizontal shading devices (overhangs):		These are useful for building façades where the sun's rays are at a high angle of incidence, in short, where the sun appears high in the sky. Examples include summer mid-day sun on either the northern or southern façades of a building for higher latitudes, or east and west façades for equatorial latitudes.
Vertical shading devices (fins):		These applications are useful where the sun's rays are at a low angle of incidence (where the sun appears low in the sky). Examples include eastern sun on eastern façades, western sun on western façades, and winter sun on southern or northern façades in high latitudes.
Combined shading devices (egg crate):		"Egg crate" devices are used for conditions where different times of the year warrant different shading needs.
Moveable shading devices – louvres or shutters	 	These devices are used to control sunlight during the day as well as reduce heat losses at night. They are moveable and can be mechanical or manual. They often provide maximum shading as they fully cover the window. These shading devices also protect from inclement weather (hail, wind, or rain) as well as provide privacy and security.

The effectiveness of a shading device varies depending on the location towards the equator (latitude) and the orientation of the window.

Table **17** gives an early indication of the appropriate type of shading device for each orientation.

Table 17: Shading strategies for different orientations at the design stage.

ORIENTATION	EFFECTIVE SHADING
Equator-facing	Fixed Horizontal Device
East	Vertical Device/Louvres (moveable)
Pole-facing	Not required
West	Vertical Device/Louvres (moveable)

Example:

An office building in Istanbul (Turkey) has 1-meter deep horizontal shading on 3 meters high windows in all directions. What is the shading factor for these windows?

The shading factor can be calculated with the built-in calculator in the EDGE software online. If calculating the factor manually, use the following steps:

Step one is to determine the latitude of Istanbul (41 N) from the EDGE online tool design tab, under "Key Assumptions for the Base Case".

Step two is to use the table provided for Horizontal shading (Table 13)and look for the matching latitude category which is "40° to 49°". As the shading is 1/3rd of the window height, "D_v=H/3" should be selected. The average shading factor is 0.30.

Step three is to select external shading measure in the EDGE App and input 0.30 in to the average annual shading factor (AASF) field.

Relationship to Other Measures

External shading reduces the heat gain through solar radiation, therefore a glazing type with a higher solar heat gain coefficient can be selected without a significant negative impact. As external shading cuts the solar heat before it hits the glazed element, it reduces radiative heat gain compared to a treated glass without shading, thus offering better thermal comfort conditions.

Shading reduces heat gain and, therefore, cooling loads. The extent of the savings achieved in cooling energy from shading will be impacted by the efficiency of the cooling system. With a more efficient cooling system, the magnitude of savings from shading alone will be less, even though the combined savings will be greater.

In heating mode, the heating consumption may be increased when external shading is incorporated, due to the reduction of solar heat gains in winter, if shading is not well designed. Well-designed shading cuts out the summer sun but allows in the winter sun which is at a lower altitude.

Assumptions

For the base case, EDGE assumes that no solar shading is present. For the improved case, EDGE assumes a shading factor equivalent to shading devices with a proportion of 1/3 of the height and the width of the window, fitted to all windows. The shading factor is the annual average of eight orientations as shown in the last column of Table 13, Table 14, and Table 15, which is a combination of both vertical and horizontal solar shading.

Compliance Guidance

The information required to demonstrate compliance will depend on the design solution adopted. The simplest design approach is the installation of egg crate shading devices (depth of 1/3 the height and the width) on all windows on all façades. Design teams may prefer to specify the shading device according to the orientation. Table 13, Table 14, Table 15, and Table 16 can be used as guidelines for different sizes and types of shading devices and orientation. Compliance is achieved when the design team has correctly entered the average of the

shading factor of all orientations. In the case of external movable shades, the design team can select a Combined Overhang with the greatest projection (W/1 and H/1). In the instance that the building has a more complex shading design, the design team can use specialized software that uses the AASF equation given in the approach section above, to demonstrate that average shading factors have been achieved.

Design Stage	Post-Construction Stage
At the design stage, the following must be used to demonstrate compliance: · All façade elevation drawings highlighting the provision of horizontal and vertical shading devices; and · Window details clearly showing the depth of the shading device and the calculation of the proportion.	At the post-construction stage, the following must be used to demonstrate compliance: · Photographs of the shading devices on all façades; or · As-built façade drawings showing the shading devices that have been installed; or · Update of shading factor calculations when changes have occurred in the design stage.

E03 - REFLECTIVE PAINT/TILES FOR ROOF

Corresponds to HME02, RTE02, OFE02, HSE02, EDE02

Requirement Summary

This measure can be claimed if the solar reflectivity (albedo) of the roof is greater than the local base case as set out in the Key Assumptions for the Base Case in the Design section. EDGE will calculate the impact of any improvement beyond the base case.

Intention

Specifying a reflective finish for the roof can reduce the cooling load in air-conditioned spaces and improve thermal comfort in non-air-conditioned spaces. Due to the reduction in surface temperature, the service life of the finish also improves, and the impact on the urban heat island effect[4] can be reduced.

Approach/Methodologies

EDGE uses the solar reflectivity (albedo) of the roof finish as the indicator of best practice. This is the part of the total incident solar radiation that is reflected back from a surface. Unlike Visible Solar Reflectance, it includes the full solar spectrum. It does not include the effect of emittance which is reflected in a metric such as Solar Reflectance Index (SRI).

The solar reflectivity for a specific roofing material and finish can be acquired from the product manufacturer. It is often indicated in the product data sheet or laboratory test results published on manufacturers' websites. Solar reflectivity is expressed as a fractional value between 0 and 1, or as a percentage.

By subtracting the solar reflectivity from the total level of solar radiation that falls on the roof surface, EDGE calculates the portion of solar radiation that is transferred into the building.

To model more than one roof type, use weighted average values.

To specify a green roof, adjust the solar reflectivity of the roof (use the default of 70% if the actual value is not available), and the insulation of the roof (U-value) to define the green roof condition. Also select the insulation type used in the roof assembly in the Materials tab, under Roof Insulation.

Table 18 provides an indication of the values for different roof finishes, but is meant only as a guide. Manufacturers' published values must be used in the EDGE assessment. If manufacturer data is not available, the EDGE reference values may be used.

[4] A city's core temperature is often significantly higher than its surrounding area due to the retention of heat from the built environment.

Table 18: Solar reflectivity values for typical roofing materials[5]

Generic Roofing Materials	Solar Reflectivity
Gray EPDM	23%
Gray Asphalt Shingle	22%
Unpainted Cement Tile	25%
White Granular Surface Bitumen	26%
Red Clay Tile	33%
Light Gravel on Built-Up Roof	34%
Aluminum	61%
White-Coated Gravel on Built-Up Roof	65%
White Coating on Metal Roof	67%
White EPDM	69%
White Cement Tile	73%
White Coating - 1 Coat, 8 mils*	80%
PVC White	83%
White Coating - 2 Coats, 20 mils*	85%

* mil is equal to .001 inches or .0254 millimeter

Potential Technologies/Strategies

The key factor in the solar reflectivity of the material or finish is its color. In warm climates a white finish is ideal to maximize reflectivity. If a white finish is not possible then the designer should select a very light color.

[5] Source: Adapted from the LBNL Cool Roofing Materials Database. These values are for reference only and are not for use as substitutes for actual manufacturer data.

Relationship to Other Measures

The impact that the solar reflectivity of the roof has on the energy consumption of a building is dependent upon the insulation levels and the approach used to cool the building, as well as the efficiency of any cooling systems.

The solar reflectivity of the roof finish has a decreased effect on the internal heat gains as the insulation levels are increased. Super-insulated buildings may not benefit significantly from roof finishes with a high solar reflectivity. Higher solar reflectivity values will have no effect on the energy consumption in passively cooled buildings, but may have an impact on virtual energy and, therefore, EDGE results due to occupant comfort.

As the efficiency of the cooling system increases, the solar reflectivity will have a decreasing impact on energy consumption.

If the roof area is a useable area (i.e. for roof activities), then the use of bright white colors is not recommended as they can cause glare and discomfort.

Assumptions

The base case for solar reflectivity may vary in different countries. The base case assumption can be seen in the Design tab under Advanced Settings: Key Assumptions for the Base Case. The typical default value is 30%. The improved case has a default value of 70% which can be adjusted by the user. The actual solar reflectance / reflectivity provided by the manufacturer must be provided for certification.

Compliance Guidance

At both the design and post-construction stage, it is important to ensure that the value obtained for the roof material/finish is the solar reflectivity of the finish rather than an alternative indicator of performance. Solar reflectivity is also referred to as solar reflectance (R). Other values that may be provided by a manufacturer include the solar reflectance index (SRI), visible solar reflectance, the emittance, or gloss units, which are not the same as solar reflectivity.

Design Stage	Post-Construction Stage
At the design stage, the following must be used to demonstrate compliance: · Building design drawings showing the roof material and roof finish; or · Roof specification with solar reflectivity of the roof surface indicated; or · Bill of quantities with the roof finish clearly marked.	At the post-construction stage, the following must be used to demonstrate compliance: · Photographs of the roof materials and finish (where the finish is white, this can be awarded without further evidence); and, either · A product data sheet for the materials and finish (including the solar reflectivity value); or, · Delivery note and purchase documents indicating that the specified roof finish has been delivered to the construction site.

E04 – REFLECTIVE PAINT FOR EXTERNAL WALLS

Corresponds to HME03, RTE03, OFE03, HSE03, EDE03

Requirement Summary

This measure can be claimed if the solar reflectivity (albedo) of the external wall finish is greater than the local base case as set out in the Key Assumptions for the Base Case in the Design section. EDGE will calculate any improvement beyond the base case.

Intention

Specifying a reflective finish for the walls can reduce the cooling load in air-conditioned spaces and improve thermal comfort in non-mechanically cooled spaces. Due to the reduction in surface temperature, the service life of the finish can also be improved and the impact on the urban heat island effect[6] can be reduced.

Approach/Methodologies

EDGE uses the solar reflectivity of the wall finish as the indicator of best practice. This is the part of the total incident solar radiation that is reflected back from a surface. Unlike Visible Solar Reflectance, it includes the full solar spectrum, but does not include the effect of emittance which is reflected in a metric such as Solar Reflectance Index (SRI).

The solar reflectivity for specific wall finishes can be acquired from the product manufacturer. It is often indicated in the product datasheet or laboratory test results published on manufacturers' websites.

[6] A city's core temperature is often significantly higher than its surrounding area due to the retention of heat from the built environment.

Generic Wall Materials	Solar Reflectivity
New concrete	35-45%
New white Portland cement concrete	70-80%
Unpainted concrete masonry unit	40%
White Plaster	90%
White acrylic paint	70%
Light-colored acrylic paint (shades of white)	65%
Medium-colored acrylic paint (green, red, brown)	45%
Dark-colored acrylic paint (dark brown, blue)	25%
Dark blue, Black acrylic paint	15%
Fired clay bricks	17-56%
Red Brick	40%

Table 19 provides an indication of the ranges for different materials but is meant only as a guide. Manufacturers' published values must be used in the EDGE assessment. If manufacturer data is not available, the EDGE reference values may be used as an exception.

Table 19: Solar reflectivity of typical wall finishes[7]

Generic Wall Materials	Solar Reflectivity
New concrete	35-45%
New white Portland cement concrete	70-80%
Unpainted concrete masonry unit	40%
White Plaster	90%
White acrylic paint	70%
Light-colored acrylic paint (shades of white)	65%
Medium-colored acrylic paint (green, red, brown)	45%
Dark-colored acrylic paint (dark brown, blue)	25%
Dark blue, Black acrylic paint	15%
Fired clay bricks	17-56%
Red Brick	40%

Potential Technologies/Strategies

The key consideration of the material used on the façade is its color and potential solar reflectivity.

Relationship to Other Measures

The impact that the solar reflectivity of the walls has upon the energy consumption in a building is dependent on the insulation levels, as well as the approach used to cool the building and the efficiency of any cooling systems.

The solar reflectivity of the wall finish has a decreased effect on the internal heat gains as the insulation levels are increased. Super-insulated buildings may not benefit significantly from wall finishes with a high solar

[7] Ranges are taken from various manufacturers' websites.

reflectivity. Higher solar reflectivity values will have no effect on the energy consumption in passively cooled buildings, but may have an impact on the EDGE rating due to occupant comfort.

As the efficiency of the cooling systems increases, the solar reflectivity will have a decreasing impact on reducing the energy consumption.

A highly reflective surface might cause glare and should be taken into consideration by the design team.

Assumptions

The base case for solar reflectivity may vary in different countries. The base case assumption can be seen in the Design tab under Advanced Settings: Key Assumptions for the Base Case. The typical default value is 30%. The improved case has a default value of 70% which can be adjusted by the user. The actual solar reflectance / reflectivity provided by the manufacturer must be provided for certification.

Compliance Guidance

At both the design and post-construction stage it is important to ensure that the value obtained for the wall material/finish is the solar reflectivity of the finish rather than an alternative indicator of performance. Other values that may be provided by a manufacturer include the solar reflectance index (SRI), visible solar reflectance, the emittance or gloss units, which are not the same as solar reflectivity.

Design Stage	Post-Construction Stage
At the design stage, the following must be used to demonstrate compliance: · Building design drawings showing the wall finish; or · Wall specification with solar reflectivity of the wall's surface indicated; or · Bill of quantities with the wall finish clearly marked.	At the post-construction stage, the following must be used to demonstrate compliance: · Photographs of the wall materials and finish (where the finish is white, this can be awarded without further evidence); and, either · A product data sheet for the wall finish (including the solar reflectivity value); or · A delivery note and purchase documents indicating that the specified wall finish has been delivered to the construction site.

Natural light is amply available during daytime hours in most climates. Typically, just 1%-5% of the diffused exterior lighting available outside the building is sufficient to light up the interiors to the desired light levels. An intelligent daylight design has the following features:

- Optimum glass area: Windows need to be appropriately sized to allow sufficient diffused light into the space, without causing too much heat transfer. Especially in warm climates, a large amount of window area (above 40% window to wall ratio) may result in excessive cooling load, which may outweigh any benefits gained through daylighting control. Location and orientation of glass is also critical. South and North facing glass are more appropriate as they can be shaded easily and do not cause as much glare. Also, windows that are higher on the wall are more efficient in allowing diffused light deeper into the space.

- Suitable sun shading: Diffused sunlight is more desirable for daylighting. Direct sunlight should be avoided into regularly occupied spaces, as it causes glare and overheating. Windows on the south and north façades should be shaded with horizontal overhangs, whose depth is dictated by the latitude of the building location. In tropical countries, the required depth of horizontal shading is quite small. East and west windows should be avoided as much as possible. If provided, they should be equipped with vertical shading or full glass shading.

- Appropriate glass product: In climates where solar heat is undesirable, glass with low Solar Heat Gain Coefficient (SHGC) should be used. SHGC is the proportion of solar heat that the glass allows to pass through to the interior space. At the same time, care should be taken that the Visible Light Transmittance (VLT) of the product is not too low, as it will reduce the amount of usable light entering the space.

- Automated daylight control system: Energy is saved through daylighting only if the electric lights are switched off. It is desirable that the switching be done through automated controls to avoid missed opportunities. The two commonly used daylighting control types are Stepped and Continuous Dimming. A Stepped system turns off some lamps in the space when enough natural light is available by the photo sensor. A Continuous Dimming system dims down all lights to maintain the desirable light levels. Stepped controls are less expensive, while the Continuous Dimming system offers more savings. For both systems, the photo sensor should be appropriately located and calibrated to be effective.

Relationship to Other Measures

Lighting controls can reduce the amount of energy used by lighting in rooms, therefore the more efficient the light bulbs are, the less impact the automated controls will have. However, when using controls with energy efficient lighting, one should make sure to choose the correct light bulbs, which are not impacted by the increased switching or dimming.

As lighting controls help to reduce unnecessary use of lighting which produces heat, cooling loads are reduced. Both "Lighting" and "Cooling Energy" are reduced in the energy graph, while "Heating Energy" is increased.

The amount of savings achieved with a daylighting measure will be affected by the Window to Wall Ratio entered in the WWR measure.

Energy Efficiency Measures 30.00%

- ✓ HTE01 Reduced Window to Wall Ratio - WWR of 69.09%
  WWR % 69.09
- HTE02 External Shading Devices - Annual Average Shading Factor (AASF) of 0.61
- HTE03 Insulation of Roof : U-value of 0.44
- HTE04 Insulation of External Walls : U-value of 0.27
- HTE05 Low-E Coated Glass : U-value of 3 W/㎡.K and SHGC of 0.45
- ✓ HTE06 Higher Thermal Performance Glass : U-value of 1.98 W/㎡.K and SHGC of 0.28
  W/㎡.K 1.98 SHGC 0.28
- HTE07 Natural Ventilation - Corridors
- HTE08 Natural Ventilation - Guest Rooms/Apartment Area with Auto Controls
- HTE09 Variable Refrigerant Volume (VRV) Cooling System - COP of 3.5
- HTE10 Air Conditioning with Air Cooled Screw Chiller - COP of 3.2
- ✓ HTE11 Air Conditioning with Water Cooled Chiller - COP of 6
  COP 6
- HTE12 Ground Source Heat Pump - COP of 4.65
- HTE13 Absorption Chiller Powered by Waste Heat - COP of 0.7
- HTE14 Recovery of Waste Heat from the Generator for Space Heating
- ✓ HTE15 Variable Speed Drives on the Fans of Cooling Towers
- ✓ HTE16 Variable Speed Drives Pumps
- HTE17 Sensible Heat Recovery from Exhaust Air - Efficiency of 60%
- HTE18 High-Efficiency Condensing Boiler for Space Heating - Efficiency of 90%
- ✓ HTE19 High-Efficiency Boiler for Water Heating - Efficiency of 90%
  % Eff. 90
- HTE20 Variable Speed Hoods with Automated Fan Controls
- HTE21 Preheat Water Using Waste Heat from the Generator
- HTE22 Heat Recovery from Grey Water - Efficiency of 30%
- HTE23 Heat Recovery from Laundry Waste Water - Efficiency of 30%
- ✓ HTE24 Heat Pump for Hot Water - COP of 4
- HTE25 Energy-Saving Light Bulbs - Internal Spaces
- HTE26 Energy-Saving Light Bulbs - External Spaces
- HTE27 Energy-Saving Light Bulbs - Back-of-House
- ✓ HTE28 Lighting Controls for Corridors
- ✓ HTE29 Occupancy Sensors in Bathrooms
- HTE30 Solar Hot Water Collectors - 50% of Hot Water Demand
- ✓ HTE31 Solar Photovoltaics - 0.0125% of Total Energy Use
  % of Annual Electricity Use 0.0125 Capacity (kWp) 0.6
- HTE32 Other Renewable Energy for Electricity Generation
- HTE33 Offsite Renewable Energy Procurement - Equal to 100% of tota Operational CO2
- HTE34 Carbon Offset - 100% of Total CO_2
- HTET3 Consumption Based Energy Meters For
- HTET4 Smart Energy Meters for Electrical Energy

Ambient Noise Level Inspection

Bengal Hotels and Resorts Ltd.

Inspection Ref. No: I/N 10971

Contact Us

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General Information		
Invoice Reference No: GB/2023/12/62		Inspection Date: 25.01.2024
Inspection Reference No: **I/N 10971**		Inspection Duration: 10am-12pm
Report Generation Date:	03.02.2024	Inspection Description: Ambient Noise Level
Report Submission Date:	11.02.2024	Inspection location: Around of facility premises
Inspection Standards: 2004/108/EEC		
Company Name: **Bengal Hotels and Resorts Ltd.** *Address: 208, Tejgaon - Gulshan Link Road, Dhaka*		Contact Person: **Assaduzzaman** *EHS In charge*

On Site Inspection Team

Rubayet Iqbal Sagor
Executive (Operation)
Environmental Engineer

Report Prepared by:	Quality Checked:
Arafat Hosen Sourob *Executive (Operation)* *Environmental Engineer*	**Fayez Ahammad** *Sr. Executive (Operation)* *B.Sc. in Civil & Environmental Engineering*

Report Approved by:

Engr. Syed Tasnem Mahmood
Chief Environmental Engineer & CEO
B.Sc. & M.Sc. (Civil and Environmental Engineering)
MIEB No.: M/35960

Introduction:

Noise pollution or noise disturbance is the disturbing or excessive noise that may harm the activity or balance of human or animal life. The main source of ambient noise pollution for an industry is the machineries and activities for production, power generation with in-house captive power plant, raw material and goods loading, unloading etc.

Recently, noise pollution has been of increasing concern worldwide, particularly in most garment factories. The noise problems of the modern industrial societies seem incomparable to the past given the larger sources of noise now present outdoors and indoors. According to the World Health Organization, industrial machineries and activity noise is one of the main sources of environmental noise exposure.

Noise levels are measured in decibels (dB). One decibel is the threshold of hearing. Approximately 60 dB is the level of normal talking. According to World Health Organization (WHO), the permissible noise level in industrial environments should not exceed 85 dB. Exposure for more than six hours a day to NOISE in excess of 85 dB is potentially hazardous to health.

Bengal Hotels and Resorts Ltd. has hired GREENBUD Testing & Inspection Services Private Limited to inspect the Ambient Noise level. GREENBUD has covered four locations for testing the noise level and generated report according to the activity occupancy of the area.

Method of Analysis:

Inspection of noise level was done using direct reading instruments. During the analysis, a standard work instruction stated in the **TP-GB-02** was followed.

Deltadesh Pvt. Ltd. Dhaka

Ambient Noise Level Inspection Result:

Sl. No.	Inspection Area		Inspection Status				
			Reference of Relevant Standard		Obtained Result (dB)	SPCR, 2006 Limit	WHO Limit
	Point	Sample	Sound Pollution Control-2006 (dB)	WHO Guide Line (dB)			
1	Location 1 23°46'20.41"N 90°24'48.09"E	Sample-01	70	70	68	√	√
2		Sample-02	70	70	68	√	√
3	Location 2 23°46'19.72"N 90°24'48.11"E	Sample-01	70	70	64	√	√
4		Sample-02	70	70	66	√	√
5	Location 3 23°46'19.28"N 90°24'46.36"E	Sample-01	70	70	67	√	√
6		Sample-02	70	70	63	√	√
7	Location 4 23°46'20.94"N 90°24'45.26"E	Sample-01	70	70	60	√	√
8		Sample-02	70	70	63	√	√

****Abbreviations and Acronyms:** *SPCR=Sound Pollution Control Rules; WHO = World Health Organization; dB = decibel.*

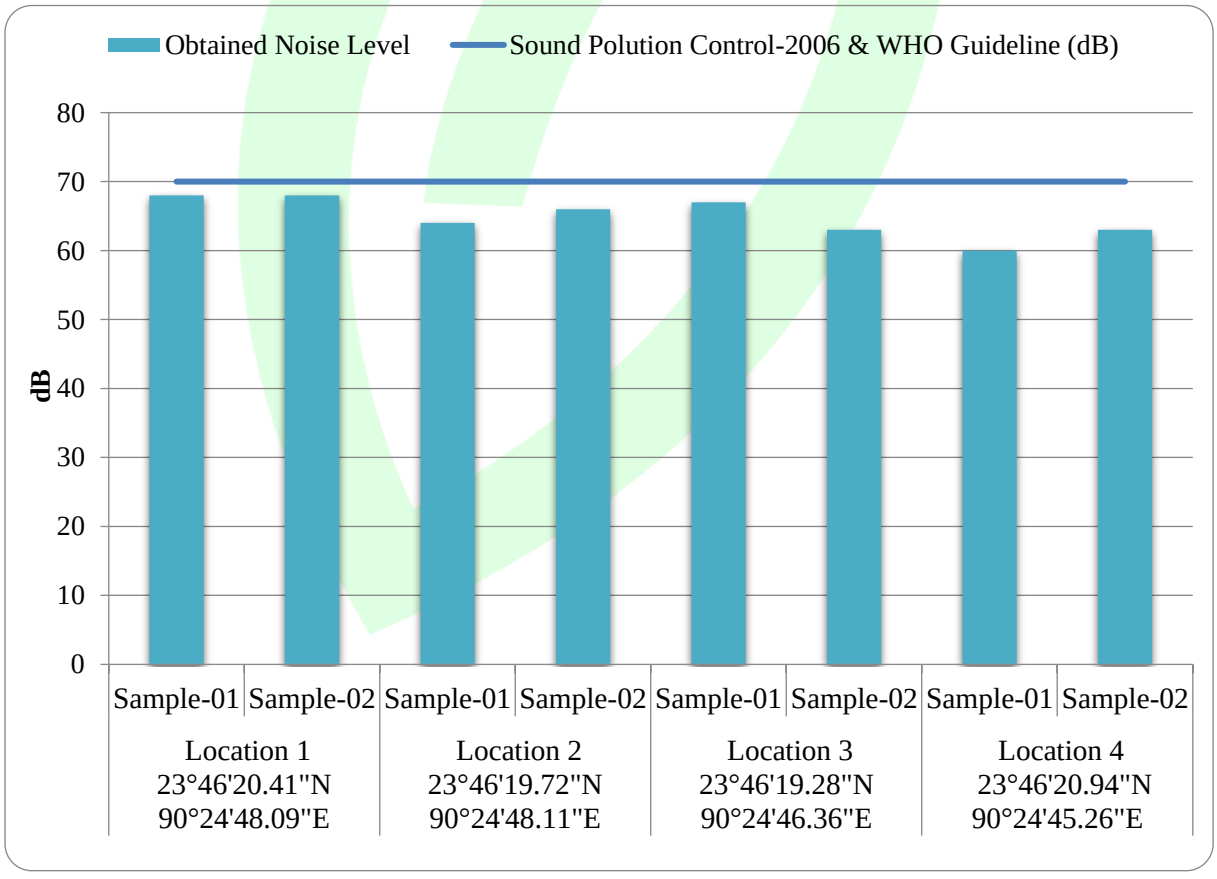

Figure: Ambient Noise Level Monitoring Chart

Discussion and Recommendation:

As **Bengal Hotels and Resorts Ltd**. is situated in Commercial zone, therefore the noise level must be within 70 dB according to **Sound Pollution Control Rules-2006**, DoE, Bangladesh. During inspection, noise level in all the inspected locations has been found in compliance with the DoE and WHO standard limit.

Following recommendations are suggested to reduce the adverse effect:

- ✓ Change the activity related to the generated noise so that the sound level is reduced; i.e., reducing motor power or speed of rotating drum of equipment, repair faulty equipment such as loose bolts and nuts etc.
- ✓ Increase greenery around the facility area as green belt act as natural sound barrier.
- ✓ Construct 300 mm thick wall around the generator room and use of fire door as a means of noise baffling measures.
- ✓ Employee who exposed to a noise level greater than 75 dB for duration of more than 8 hours per day must use hearing protection.
- ✓ Use of acoustic insulating materials, isolation of the noise source, and other engineering controls should be investigated and implemented where feasible.

Facility is suggested to assess the Noise level once annually at least if all other set ups are constant.

Engr. Syed Tasnem Mahmood
CEO and Chief Environmental Engineer
GREENBUD
MIEB No.: M/35960
ISO 14001 certification Number.: EA/15/IN/16050
ISO 50001 certification Number.: ENMS/16/IN/533

SECTION-13: DRAWINGS

(Enclosed supplied by DEC)

BENGAL HOTELS AND RESORTS LIMITED
BENGAL HOUSE, GULSHAN AVENUE,
DHAKA 1212, BANGLADESH

BENGAL HOTELS AND RESORTS LIMITED

NIKETON, GULHAN-1, DHAKA, BANGLADESH

UPDATED FINAL ARCHITECTURAL DESIGN DRAWINGS

15 July 2024

DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
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The Portico Building
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Deltadesign Pvt. Ltd. Dhaka

List of Drawing	
Sheet Number	Sheet Name
A000	List of Drawing
A001	Perspective
A002	Room Schedule & Material Finishing
A003	Room Schedule & Material Finishing
A100	Layout
A101	Basement 3
A102	Basement 2
A103	Basement 1
A104	Level 1 Floor Plan
A105	Level 2 Floor Plan
A106	Level 3 Floor Plan
A107	Level 4 Floor Plan
A108	Level 5,6 Floor Plan
A109	Level 7-25 Floor Plan
A110	LEVEL 26 - Roof Plan
A201	Elevation 1
A202	Elevation 2,4
A203	Elevation 3
A301	Section 1
A302	Section 2
A303	Section 3
A304	Section 4
A305	Section 5
A401	Door Detail 1
A402	Door Detail 2
A403	Window Detail 1
A404	Window Detail 2
A405	Window Detail 3
A406	Window Detail 4
A501	Stair-FST 1 - B3-L2
A502	Stair-FST 1 - L3-Roof
A503	Stair-FST 2-B3-L2
A504	Stair- FST2-L3-L25
A505	Stair-FST3
A506	Stair4
A507	Parking Stair & Loading Stair
A508	Ramp R1,R3
A509	Ramp R2-R4
A601	Staff Toilet
A602	Staff Locker
A701	KITCHEN & CHILLER SUNKEN FLOOR
A702	FHC TYPICAL DETAIL
A703	Guest room Facade Wall Section
A704	Entrance Aluminium Cladding Pattern
A705	DROP OFF CANOPY
A706	Aluminium Facade Clading
A707	Section Detail Swimming Pool
A708	Swimming Pool Stair

SYMBOLS ARCHITECTURAL DRAWING

BREAK LINE	WINDOW NUMBER
NORTH DIRECTION	FLOOR NUMBER CEILING NUMBER
HORIZONTAL AND VERTICAL COLUMN CENTER LINE	LEVEL LINE EXISTING CONTOUR LINE NEW CONTOUR LINE
DIRECTION OF EXTERNAL ELEVATION	BOUNDARY LINE, FENCE BENCH MARK
DIRECTION OF INTERNAL ELEVATION	HIDDEN LINE PUBLIC DRAINAGE LINE
IDENTIFICATION OF DETAIL INDICATES DRAWING SHEET ON WHICH DETAIL IS SHOWN	CANAL KLONG RAILWAY
BUILDING SECTION IDENTIFICATION OF SECTION INDICATES DRAWING SHEET ON WHICH SECTION IS SHOWN	HOSPITAL
SIMILIER SECTION IDENTIFICATION OF SECTION INDICATES DRAWING SHEET ON WHICH SECTION IS SHOWN	MAJOR TITLE LABEL
LATERITE COMPACT ROAD	MINOR TITLE LABEL
EARTH COMPACT ROAD OR R.C. ROAD	REVISION PROCEDURE
RC BRIDGE	GENERAL NOTES
WOOD BRIDGE	HIGH WATER LEVEL
PEDESTRIAN OVERPASS BRIDGE	SLIDE DIRECTION
EXISTING BUILDING	GLASS ELEVATION
EXISTING BUILDING WHICH WILL BE DELETED	MIRROR ELEVATION
CONSTRUCTION BUILDING	STAIR IDENTIFICATION TYPE
ADDITIONAL	ELEVATOR / LIFT TYPE
IDENTIFICATION OF ROOM FLOOR LEVEL ROOM NUMBER	DIRECTION OF SLOPE
DOOR NUMBER	

SYMBOLS MATERIAL

CONCRETE DETAIL
SAND, GRAVEL, FILL DETAIL
FACE BRICK WALL DETAIL
EARTH DETAIL
METAL DETAIL
STEEL LARGE SCALE DETAIL
PLYWOOD DETAIL
ROUGH WOOD DETAIL
FINISH WOOD DETAIL
NATURAL STONE DETAIL
GLASS DETAIL
CERAMIC TILE GLAZED TILE, CLAY TILE DETAIL
INSULATION BOARD
CONCRETE BLOCK WITH CEMENT FINISHED DETAIL
LIGHT WEIGHT BLOCK 100X200X400 MM, 200X200X400 MM
THERMALITE BLOCK 200X200X400 MM, 250X200X400 MM
JOIST FINISHED WITH PLYWOOD OR GYPSUM BOARD
GLASS BLOCK DETAIL
BRICK SCREEN WALL DETAIL

ARCHITECTURAL ABBREVIATIONS

[illegible]	ABOVE	[illegible]	[illegible]	[illegible]	FOUNDATION	[illegible]	VERTICAL
ABT	ABOUT	KM	KILOMETER	FIN	FINISH	WD	WOOD
AC	AIR CONDITIONING	LAV	LAVATORY	JT	JOINT	GA	GAUGE
ASB	ASBESTOS	LONG	LONGITUDINAL	FTG	FOOTING	GALV	GALVANIZED
[illegible]	[illegible]	M	METER	[illegible]	FLOOR [illegible]	GND	GROUND
AT	ASPHALT TILE	MM	MILLIMETER	FA	FRESH AIR	GR	GRADE
ALUM	ALUMINUM	MAT	MATERIAL	ID	INSIDE DIMENSION	GYP	GYPSUM
@	AT RATE OF	MECH	MECHANICAL	INSUL	INSULATION	HOR	HORIZONTAL
CEM	CEMENT	MET	METAL	INT	INTERIOR	HDW	HARDWARE
CLG	CEILING	NIC	NOT IN CONTRACT	INTERM	INTERMEDIATE	SS	STAINLESS STEEL
CERT	CERAMIC TILE	NO	NUMBER				
CM	CENTIMETER	OC	OF CENTER				
CL	CLEAR	OP	OIL PAINT				
CONC	CONCRETE	PLAS	PLASTER				
COL	COLUMN	PROJ	PROJECTED				
CND	CONDUIT	PARTN	PARTITION				
CONN	CONNECTION	QTY	QUANTITY				
CONST	CONSTRUCTION	PL	PLATE				
CONT	CONTINUOUS	RAD	RADIUS				
CORR	CORRUGATED	RD	ROOF DRAIN				
CS	CEILING SLAB	REF	REFERENCE				
CL	CENTER LINE	REINF	REINFORCE				
DET	DETAIL	SCHED	SCHEDULE				
DIM	DIMENSION	SECT	SECTION				
DIA	DIAMETER	SB	SPLASH BLOCK				
DS	DUCT SPACE	SPEC	SPECIFICATION				
DWG	DRAWING	SHT	SHEET				
EF	EACH FACE	STD	STANDARD				
EW	EACH WAY	SS	SERVICE SINK				
EL	ELEVATION	SP	STAIR PRESSURIZATION				
EQUIP	EQUIPMENT	SQMT	SQUARE METER				
EXH AIR	EXHAUST AIR	SUSP	SUSPENDED				
ESC	ESCALATOR	SYM	SYMMETRICAL				
ELEC	ELECTRICAL	SW	SWITCH				
EXIST	EXISTING	TW	TOP WALL				
EXP	EXPANSION	TZ	TERRAZZO				
FD	FLOOR DRAIN	VAT	VINYL ASBESTOS TILE				
FL	FLOW LINE	VENT	VENTILATE VENTILATOR				

BENGAL hotels & resorts

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV NO	DATE	DESCRIPTION	BY	REV NO	DATE	DESCRIPTION	BY
-	12.03	Final Arch. Design DWG 2019/12/03			09.02	3rd Final Arch. Design DWG 2021/09.02	
	06.23	2nd Final Arch. Design DWG 2020/06/23					
	03.05	2nd Final Arch. Design DWG 2021/03/05					
		PMC comment					

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Architect & Planners
Interdesign International Co., Ltd.
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PROJECT
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE
List of Drawing

DRAWN BY	IDL	CHECKED BY	IDL
DESIGN BY	Sathapanick S	PROJECT MGR	Chanintorn
DATE	28.01/2022	SCALE	1 : 200
PROJECT NO	113073		
DWG NO	A000		

Deltades Pvt. Ltd. Dhaka

01/28/2022 10:34:01 AM

1 Front Perspective

BENGAL hotels & resorts

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY
-	12.03	Final Arch. Design DWG 2019/12/03			09.02	3rd Final Arch. Design DWG 2021/09.02	
	06.23	2nd Final Arch. Design DWG 2020/06/23					
	03.05	2nd Final Arch. Design DWG 2021/03/05					
		PMC comment					

DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
VADHANA BANGKOK 10110 THAILAND

Architect & Planners
Interdesign International Co., Ltd.
The Porsco Building

PROJECT: BENGAL HOTELS AND RESORTS A FIVE STAR HOTEL	DRAWN BY: IDL	CHECKED BY: IDL	
	DESIGN BY: Sathapanick S.	PROJECT MGR.: Chanintorn	
TITLE: Perspective	DATE: 28.01/2022	SCALE:	
	PROJECT NO.	113073	
	DWG NO	A001	

01/28/2022 10:34:06 AM

Material List

Material Type	Wall & Floor Material	Finishing
W1	Light weight hollow block wall Thk 100 mm. / plaster both side	Paint / PVC Skirt H. 100 mm
W2	Light weight hollow block wall Thk 150 mm. / plaster both side	Paint / PVC Skirt H. 100 mm
W3	Light weight hollow block wall Thk 100 mm. / plaster both side	Ceramic tile H.2100 mm. / Ceramic skirt 100 mm
W4	Light weight hollow block wall Thk 150 mm. / plaster both side	Ceramic tile H.2100 mm. / Ceramic skirt 100 mm
W5	Light weight hollow block wall Thk 100 mm. / plaster both side	2 tone paint / Rubber Wall Guard H. 800 mm & Corner
W6	Light weight hollow block wall Thk 150 mm. / plaster both side	2 tone paint / Rubber Wall Guard H. 800 mm & Corner
W7	Light weight hollow block wall Thk 75 mm. / plaster both side	Paint / PVC Skirt H. 100 mm
W8	Light weight hollow block wall Thk 75 mm. / plaster both side	Ceramic tile H.2100 mm.
W9	Concrete / plaster	Water proof system - Coating / Ceramic floor tile 300x300
W10	Concrete / plaster	Aluminium Cladding
W11	Concrete / plaster	Paint
W12	Steel wire mesh fence	Paint
FL1	Concrete Slab / Straight edge	Floor Ceramic Tile 300 x 300 mm. non slip
FL2	Concrete Slab / Straight edge	Floor Ceramic Tile 600 x 600 mm. non slip
FL3	Concrete Slab / Straight edge	Floor Vynil Tile
FL4	Concrete Slab / Straight edge	Floor Hardener
FL5	Concrete Slab / Straight edge	Epoxy paint
FL6	Concrete Slab / Straight edge	Steel trowel finish
FL7	Concrete Slab / Straight edge	Water proof system - Coating / Ceramic floor tile 300x300 non slip
FL8	Concrete Slab / Straight edge	Exposed
C1	Gypsum Board	Plaster / Paint
C2	Gypsum Board T-Bar	
C3	Gypsum Board Moisture Resistant	Plaster / Paint
C4	Aluminium Tile Ceiling	
C5	Concrete Ceiling Finishing	Paint
ID	See Interior Drawing	
LD	See Landscape Drawing	
KD	See Kitchen Drawing	
Note	Description	
W-A	Wall on up side of the room is according to plan direction	
W-B	Wall on left side of the room is according to plan direction	
W-C	Wall on right side of the room is according to plan direction	
W-D	Wall on down side of the room is according to plan direction	
W11	Concrete / plaster	Paint
W11	Concrete / plaster	Paint
W8	Light weight block wall Thk 75 mm. / plaster both side	Ceramic tile H.2100 mm.
W8	Light weight hollow block wall Thk 75 mm. / plaster both side	Ceramic tile H.2100 mm.

Room Schedule Part 1

Number	Name	Area	W-A	W-B	W-C	W-D	Floor Finish	Ceiling Finish
B1-01	Carpark B1 A	874	W9	W9	W9	W9	FL5	C5
B1-02	Carpark B1 B	527	W9	W9	W9	W9	FL5	C5
B1-03	Engineer Storage	25	W2	W2	W9	W9	FL5	C5
B1-04	Service Lift	18	W9	W9	W9	W9	FL5	C5
B1-05	Furniture Storage 1	64	W9	W2	W2	W2	FL5	C5
B1-06	Driver Room	18	W2	W2	W2	W2	FL1	C5
B1-07	Workshop / Storage	203	W9	W9	W2	W2	FL5	C5
B1-08	Exhaust Fan Room	39	W9	W9	W2	W2	FL5	C5
B1-09	Exhaust Fan Room	34	W2	W2	W2	W9	FL5	C5
B1-10	FST-1	18	W11	W11	W11	W11	FL6	C5
B1-11	FST-2	12	W11	W11	W11	W11	FL6	C5
B1-12	FST-3	12	W2	W2	W2	W11	FL6	C5
B1-13	Ramp R-3	70						C5
B1-14	Ramp R-4	77						C5
B2-01	Carpark B2 A	820	W9	W9	W9	W9	FL5	C5
B2-02	Carpark B2 B	527	W9	W9	W9	W9	FL5	C5
B2-03	EE Equipment Storage	59	W1	W1	W9	W9	FL5	C5
B2-04	Service Lift	26	W9	W9	W9	W9	FL5	C5
B2-05	Water Treatment Plant	117	W9	W1	W9	W9	FL5	C5
B2-06	WW Pump Rm.	26	W9	W9	W9	W9	FL5	C5
B2-07	FST-1	18	W11	W11	W11	W11	FL6	C5
B2-08	FST-2	12	W11	W11	W11	W11	FL6	C5
B2-09	FST-3	12	W9	W9	W2	W11	FL6	C5
B2-10	Ramp R-3	76					FL8	C5
B2-11	Ramp R-4	77					FL8	C5
B3-01	Carpark B3 A	817	W9	W9	W9	W9	FL5	C5
B3-02	Carpark B3 B	563	W9	W9	W9	W9	FL5	C5
B3-03	General Storage	59	W1	W1	W9	W9	FL5	C5
B3-04	Fire Pump Room	117	W9	W2	W9	W9	FL7	C5
B3-05	Fire Water Tank	101	W9	W9	W9	W9	FL7	
B3-06	Treated Water Tank	39	W9	W9	W9	W9	FL7	
B3-07	Service Lift	26	W9	W9	W9	W9	FL5	C5
B3-08	Wastewater Treatment	60	W9	W9	W9	W9	FL7	
B3-09	Sludge Tank	7	W9	W9	W9	W9	FL7	
B3-10	Sludge Tank Pump Rm	20	W9	W9	W9	W9	FL7	C5
B3-11	Effluent Tank Pump Rm	16	W9	W9	W9	W9	FL7	C5
B3-12	Effluent Tank	36	W9	W9	W9	W9	FL7	
B3-13	EQ. Tank	11	W9	W9	W9	W9	FL7	
B3-14	Grease Trap	14	W9	W9	W9	W9	FL7	
B3-15	Septic Tank	10	W9	W9	W9	W9	FL7	
B3-16	Pump Rm.	25	W9	W9	W9	W9	FL7	C5
B3-17	Raw Water Tank	20	W9	W9	W9	W9	FL7	
B3-18	FST-1	18	W11	W11	W11	W11	FL6	C5
B3-19	FST-2	12	W11	W11	W11	W11	FL6	C5
B3-20	FST-3	12	W11	W11	W11	W11	FL6	C5
B3-21	Ramp R-3	77					FL8	C5
B3-22	Ramp R-4	42					FL8	C5

Room Schedule Part 2

Number	Name	Area	W-A	W-B	W-C	W-D	Floor Finish	Ceiling Finish
1-01	Lobby	282	ID	ID	ID	ID	ID	ID
1-02	Front Desk	37	ID	ID	ID	ID	ID	ID
1-03	Luggage	20	ID	ID	ID	ID	ID	ID
1-04	Front Office	55	ID	ID	ID	ID	ID	ID
1-05	Lounge	202	ID	ID	ID	ID	ID	ID
1-06	Deli Shop	219	ID	ID	ID	ID	ID	ID
1-07	Lounge Pantry	18	ID	ID	ID	ID	ID	ID
1-08	Purchasing Office	11	W1	W1	W1	W1	FL1	C2
1-09	Receiving Area	16	W2	W1	W1	W1	FL1	C2
1-10	Fire Command Center / Security Control Room	26	W2	W2	W2	W2	FL1	C2
1-11	Generator Room	129	W2	W2	W2	W2	FL5	C5
1-12	Transformer	63	W2	W2	W2	W2	FL5	C5
1-13A	RMU Room	24						
1-13B	HT Meter Room	15	W1	W2	W2	W2	FL5	C5
1-14	Guest Toilet	41	ID	ID	ID	ID	FL7 / ID	ID
1-15	Disables	4	ID	ID	ID	ID	FL7 / ID	ID
1-16	General Store	122	W1	W2	W1	W1	FL1	C1
1-17	Garbage	46	W2	W2	W2	W1	FL1	C5
1-18	Staff Toilet	8	W9	W9	W9	W9	FL7	C3
1-19	General Store	39	W2	W1	W1	W1	FL1	C1
1-20	Service Corridor	62	W6	W5	W5	W5	FL5	C5

Room Schedule Part 2

Number	Name	Area	W-A	W-B	W-C	W-D	Floor Finish	Ceiling Finish
1-21	Receiving Loading	20		W2	W2	W2	FL4	C5
1-22	Chemical Store	7	W1	W1	W1	W1	FL1	C2
1-23	Kitchen	60	KD	KD	KD	KD	FL7 / KD	KD
1-24	ST-1	20	ID	ID	ID	ID	ID	
1-25	Main ENT	37	ID	ID	ID	ID	ID	ID
1-26	Drop Off	165	LD	LD	LD	LD	LD	LD
1-27	FST-1	18	W11	W11	W11	W11	FL6	C5
1-28	FST-2	22	W11	W11	W11	W11	FL6	C5
1-29	FST-3	11	W2	W2	W2	W11	FL6	C5
1-30	Ramp R-2	68						C5
1-31	Ramp R-1	99						C5
1-32	Gas Station 1	10	W12	W12	W2	W2	FL8	C5
1-33	Gas Station 2	13	W12	W2	W9	W2	FL8	C5
2-01	Function Room 1	49	W2 / ID	W2 / ID	W2 / ID	W2 / ID	ID	ID
2-02	Function Room 2	48	W2 / ID	W2 / ID	W2 / ID	W2 / ID	ID	ID
2-03	Function Room 3	57	W2 / ID	W2 / ID	W2 / ID	W2 / ID	ID	ID
2-04	Function Room 4	109	W2 / ID	W2 / ID	W2 / ID	W2 / ID	ID	ID
2-05	Corridor	155	ID	ID	ID	ID	ID	ID
2-06	Pre Function	252	W2 / ID	W2 / ID	W2 / ID	W2 / ID	ID	ID
2-07	Ballroom	428	W2 / ID	W2 / ID	W2 / ID	W2 / ID	ID	ID
2-08	Banquet Kitchen Support	44	KD	KD	KD	KD	FL7 / KD	KD
2-09	Banquet Show Kitchen	70	KD	KD	KD	KD	FL7 / KD	KD
2-10	Furniture Storage	38					FL5	C5
2-11	Furniture Storage	21					FL5	C5
2-12	Service Corridor	133	W6	W6	W5	W5	FL5	C5
2-13	Toilet	50	ID	ID	ID	ID	FL7 / ID	ID
2-14	Pantry	58	KD	KD	KD	KD	FL7 / KD	KD
2-15	FST-1	18	W11	W11	W11	W11	FL6	C5
2-16	FST-2	14	W11	W11	W11	W11	FL6	C5
2-17	FST3	14	W2	W2	W2	W11	FL6	C5
2-18	Break Out Area / Extension Area	251	ID	ID	ID	ID	ID	ID
2M-01	Control Rm.	26	W2	W1	W1	W1	FL5	C5
2M-02	MDB Rm.	117	W2	W2	W2	W2	FL5	C5
2M-03	AHU	58	W1	W1	W1	W1	FL5	C5
2M-04	ICT Room	21	W2	W2	W2	W2	FL5	C5
2M-05	AHU	36	W2	W2	W2	W2	FL5	C5
2M-06	Tele Room	8	W2	W9	W1	W1	FL5	C5
2M-07	Service Corridor	133	W6	W6	W5	W5	FL5	C5
2M-08	AHU	1636	W2	W2	W2	W2	FL5	C5
2M-09	FST-1	18	W9	W9	W9	W9	FL6	C5
2M-10	FST-3	13	W2	W2	W2	W9	FL6	C5
2M-11	Pump Room	51	W2	W2	W2	W2	FL7	C5
2M-12	Surge Tank	71	W9	W9	W9	W9	FL7	C5
3-01	All Day Dining	661	ID	ID	ID	ID	ID	ID
3-02	Bar	23	ID	ID	ID	ID	ID	ID
3-03	Corridor	94	ID	ID	ID	ID	ID	ID
3-04	Main Kitchen	223	KD	KD	KD	KD	FL7 / KD	KD
3-05	F&B Preparation	116	KD	KD	KD	KD	FL7 / KD	KD
3-06	Serv. Corridor	67	W6	W5	W5	W5	FL5	C5
3-07	Toilet	38	ID	ID	ID	ID	FL7 / ID	ID
3-08	Swimming Pool Toilet	27	ID	ID	ID	ID	FL7 / ID	ID
3-09	FST-1	18	W11	W11	W11	W11	FL6	C5
3-10	FST-2	14	W11	W11	W11	W11	FL6	C5
3-11	Swimming Pool	496	LD	LD	LD	LD	LD	LD
3-12	Roof Garden	480.	LD	LD	LD	LD	LD	LD
3-13	Pool Storage	104	W2	W2	W11	W11	FL7	C5
4-01	Spa	153	ID	ID	ID	ID	ID	ID
4-02	Spa Staff Rm.	26	ID	ID	ID	ID	ID	ID
4-03	Fitness	333	ID	ID	ID	ID	ID	ID
4-04	Training Room	Not Placed	W1	W11	W1	W1	FL3	C1
4-05	Accounts Office	Not Placed	W2	W1	W1	W2	FL3	C1
4-06	Executive Office	Not Placed	W1	W1	W11	W2	FL3	C1
4-07	Meeting Rm.	Not Placed	W2	W1	W11	W2	FL3	C1
4-08	Changing Room	113	ID	ID	ID	ID	ID	ID
4-09	First Aid	Not Placed	W1	W2	W1	W1	FL3	C1
4-10	HR Office	Not Placed	W1	W2	W1	W2	FL3	C1
4-11	Water Cooled Chiller	158	W2	W2	W1	W2	FL5	C5
4-12	Pump Room	76	W2	W2	W2	W2	FL7	C5
4-13	Staff Toilet	Not Placed	W3	W3	W3	W3	FL7	C3
4-14	Corridor	60	ID	ID	ID	ID	ID	ID
4-15	Serv. Corridor	66	W6	W6	W5	W5	FL5	C5
4-16	FST-1	18	W11	W11	W11	W11	FL6	C5
4-17	FST-2	14	W11	W11	W11	W11	FL6	C5
4M-01	Pump Room	101	W2	W2	W2	W2	FL7	C5

Deltadesh Pvt. Ltd.
Dhaka

BENGAL
hotels & resorts

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV NO	DATE	DESCRIPTION	BY	REV NO	DATE	DESCRIPTION	BY
	12.03	Final Arch. Design DWG 2019/12/03			09.02	3rd Final Arch. Design DWG 2021/09/02	
	06/23	2nd Final Arch. Design DWG 2020/06/23					
	03/05	2nd Final Arch. Design DWG 2021/03/05					
		PMC comment					

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PROJECT: BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE: Room Schedule & Material Finishing

DRAWN BY:	IDL	CHECKED BY:	IDL
DESIGN BY:	Sathapanick S.	PROJECT MGR.:	Chanintorn
DATE:	28.01/2022	SCALE:	
PROJECT NO.	11307 3		
DWG NO	A002		

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Material List

Material Type	Wall & Floor Material	Finishing
W1	Light weight hollow block wall Thk 100 mm. / plaster both side	Paint / PVC Skirt H. 100 mm.
W2	Light weight hollow block wall Thk 150 mm. / plaster both side	Paint / PVC Skirt H. 100 mm.
W3	Light weight hollow block wall Thk 100 mm. / plaster both side	Ceramic tile H.2100 mm. / Ceramic skirt 100 mm.
W4	Light weight hollow block wall Thk 150 mm. / plaster both side	Ceramic tile H.2100 mm. / Ceramic skirt 100 mm.
W5	Light weight hollow block wall Thk 100 mm. / plaster both side	2 tone paint / Rubber Wall Guard H. 800 mm & Corner
W6	Light weight hollow block wall Thk 150 mm. / plaster both side	2 tone paint / Rubber Wall Guard H. 800 mm & Corner
W7	Light weight hollow block wall Thk 75 mm. / plaster both side	Paint / PVC Skirt H. 100 mm.
W8	Light weight hollow block wall Thk 75 mm. / plaster both side	Ceramic tile H.2100 mm.
W9	Concrete / plaster	Water proof system - Coating / Ceramic floor tile 300x300
W10	Concrete / plaster	Aluminium Clading
W11	Concrete / plaster	Paint
W12	Steel wire mesh fence	Paint
FL1	Concrete Slab / Straight edge	Floor Ceramic Tile 300 x 300 mm. non slip
FL2	Concrete Slab / Straight edge	Floor Ceramic Tile 600 x 600 mm. non slip
FL3	Concrete Slab / Straight edge	Floor Vynil Tile
FL4	Concrete Slab / Straight edge	Floor Hardener
FL5	Concrete Slab / Straight edge	Epoxy paint
FL6	Concrete Slab / Straight edge	Steel trowel finish
FL7	Concrete Slab / Straight edge	Water proof system - Coating / Ceramic floor tile 300x300 non slip
FL8	Concrete Slab / Straight edge	Exposed
C1	Gypsum Board	Plaster / Paint
C2	Gypsum Board T-Bar	
C3	Gypsum Board Moisture Resistant	Plaster / Paint
C4	Aluminum Tile Ceiling	
C5	Concrete Ceiling Finishing	Paint
ID	See Interior Drawing	
LD	See Landscape Drawing	
KD	See Kitchen Drawing	
Note	Description	
W-A	Wall on up side of the room is according to plan direction	
W-B	Wall on left side of the room is according to plan direction	
W-C	Wall on right side of the room is according to plan direction	
W-D	Wall on down side of the room is according to plan direction	
W11	Concrete / plaster	Paint
W11	Concrete / plaster	Paint
W8	Light weight block wall Thk 75 mm. / plaster both side	Ceramic tile H.2100 mm.
W8	Light weight hollow block wall Thk 75 mm. / plaster both side	Ceramic tile H.2100 mm.

Deltadesh Pvt. Ltd. Dhaka

Room Schedule Part 3

Number	Name	Area	W-A	W-B	W-C	W-D	Floor Finish	Ceiling Finish
5-01	Staff Kitchen	46	KD	KD	KD	KD	FL7 / KD	KD
5-02	Uniform	48	W1	W1	W1	W2	FL5	C5
5-03	Laundry	280	W1	W2	W1	W2	FL5	C5
5-04	Staff Male Changing Room	134	W4	W4	W3	W3	FL7	C3
5-05	Staff Female Changing Room	71	W4	W3	W4	W3	FL7	C3
5-06	House Keeping	135	W1	W1	W1	W1	FL5	C5
5-07	Service Corridor	95	W5	W5	W5	W5	FL5	C5
5-08	Service Lift	57	W11	W11	W11		FL5	C5
5-09	Prayer Room	32	W2	W2	W11	W2	FL1	C1
5-10	Boiler Plant Room	157	W2	W2	W2	W11	FL5	C5
5-11	Staff Canteen	186	W2	W1	W11		FL1	C1
5-12	FST-1	18	W11	W11	W11	W11	FL6	C5
5-13	FST-2	14	W11	W11	W11	W11	FL6	C5
5M-01	Training Room	53	W1	W11	W1	W1	FL3	C1
5M-02	HR Office	40	W1	W1	W11	W1	FL3	C1
5M-03	First Aid	14	W1	W1	W1	W1	FL3	C1
5M-04	Accounts Office	73	W1	W1			FL3	C1
5M-05	Meeting Room	33	W1	W1	W11	W1	FL3	C1
5M-06	Executive Office	45	W1	W1	W1		FL3	C1
5M-07	Staff Toilet	31	W3	W3	W3	W3	FL7	C3
5M-08	Service Corridor	137	W6	W6	W5	W5	FL5	C5
6-01	K	38	ID	ID	ID	ID	ID	ID
6-02	T	36	ID	ID	ID	ID	ID	ID
6-03	K	36	ID	ID	ID	ID	ID	ID
6-04	K	36	ID	ID	ID	ID	ID	ID
6-05	K	36	ID	ID	ID	ID	ID	ID
6-06	K	36	ID	ID	ID	ID	ID	ID
6-07	K	36	ID	ID	ID	ID	ID	ID
6-08	T	36	ID	ID	ID	ID	ID	ID
6-09	K	36	ID	ID	ID	ID	ID	ID
6-10	K	36	ID	ID	ID	ID	ID	ID
6-11	SS1/	68	ID	ID	ID	ID	ID	ID
6-12	SS2	92	ID	ID	ID	ID	ID	ID
6-13	K	45	ID	ID	ID	ID	ID	ID
6-14	D	34	ID	ID	ID	ID	ID	ID
6-15	T	36	ID	ID	ID	ID	ID	ID
6-16	D	36	ID	ID	ID	ID	ID	ID
6-17	T	35	ID	ID	ID	ID	ID	ID
6-18	K	35	ID	ID	ID	ID	ID	ID
6-19	K	35	ID	ID	ID	ID	ID	ID
6-20	Corridor	113	ID	ID	ID	ID	ID	ID
6-21	Lift Lobby	24	ID	ID	ID	ID	ID	ID
6-22	SERV.	15	W2	W11	W11	W1	FL5	C5
6-23	FST-1	18	W11	W11	W11	W11	FL6	C5
6-24	FST-2	14	W11	W11	W11	W11	FL6	C5
6-25	Telecom	6	W2	W1	W1	W11	FL5	C5
6-26	EE Room	4	W2	W11	W11	W11	FL5	C5
6-27	MAID. RM.	9	W2	W2	W1	W2	FL1	C3
6-28	AHU	17	W2	W2	W1		FL5	C5
6-29	Cooling Tower	330					FL7	
7-01	K	38	ID	ID	ID	ID	ID	ID
7-02	T	36	ID	ID	ID	ID	ID	ID
7-03	K	36	ID	ID	ID	ID	ID	ID
7-04	K	36	ID	ID	ID	ID	ID	ID
7-05	K	36	ID	ID	ID	ID	ID	ID
7-06	K	36	ID	ID	ID	ID	ID	ID
7-07	K	36	ID	ID	ID	ID	ID	ID
7-08	T	36	ID	ID	ID	ID	ID	ID
7-09	K	36	ID	ID	ID	ID	ID	ID
7-10	K	36	ID	ID	ID	ID	ID	ID
7-11	SS1/	68	ID	ID	ID	ID	ID	ID
7-12	SS2	92	ID	ID	ID	ID	ID	ID
7-13	K	45	ID	ID	ID	ID	ID	ID
7-14	T	34	ID	ID	ID	ID	ID	ID
7-15	T	36	ID	ID	ID	ID	ID	ID
7-16	T	36	ID	ID	ID	ID	ID	ID
7-17	T	35	ID	ID	ID	ID	ID	ID
7-18	K	35	ID	ID	ID	ID	ID	ID
7-19	K	35	ID	ID	ID	ID	ID	ID
7-20	Corridor	113	ID	ID	ID	ID	ID	ID
7-21	Lift Lobby	24	ID	ID	ID	ID	ID	ID
7-22	Serv. Lift	31	W2	W11	W11	W1	FL5	C5
7-23	FST-1	18	W11	W11	W11	W11	FL6	C5
7-24	FST-2	14	W11	W11	W11	W11	FL6	C5
7-25	Telecom	6	W2	W1	W1	W11	FL5	C5

Room Schedule Part 3

Number	Name	Area	W-A	W-B	W-C	W-D	Floor Finish	Ceiling Finish
7-26	EE Rm	4	W2	W11	W11	W11	FL5	C5
7-27	Maid	7	W2	W2	W1	W2	FL1	C3
22-01	SS1	76	ID	ID	ID	ID	ID	ID
22-02	T	36	ID	ID	ID	ID	ID	ID
22-03	K	36	ID	ID	ID	ID	ID	ID
22-04	SS1	74	ID	ID	ID	ID	ID	ID
22-05	K	36	ID	ID	ID	ID	ID	ID
22-06	T	36	ID	ID	ID	ID	ID	ID
22-07	SS1	73	ID	ID	ID	ID	ID	ID
22-08	SS1/	68	ID	ID	ID	ID	ID	ID
22-09	SS2/	139	ID	ID	ID	ID	ID	ID
22-10	K	34	ID	ID	ID	ID	ID	ID
22-11	K	36	ID	ID	ID	ID	ID	ID
22-12	K	36	ID	ID	ID	ID	ID	ID
22-13	K	35	ID	ID	ID	ID	ID	ID
22-14	SS1	71	ID	ID	ID	ID	ID	ID
22-15	Corridor	114	ID	ID	ID	ID	ID	ID
22-16	Lift Lobby	24	ID	ID	ID	ID	ID	ID
22-17	Serv.	31	W2	W11	W11	W1	FL5	C5
22-18	FST-1	18	W11	W11	W11	W11	FL6	C5
22-19	FST-2	14	W11	W11	W11	W11	FL6	C5
22-20	Telecom	6	W2	W1	W1	W11	FL5	C5
22-21	EE Rm	4	W2	W11	W11	W11	FL5	C5
22-22	Maid Rm.	7	W2	W2	W1	W2	FL1	C3
24-01	SS1	76	ID	ID	ID	ID	ID	ID
24-02	SS1	74	ID	ID	ID	ID	ID	ID
24-03	SS1	74	ID	ID	ID	ID	ID	ID
24-04	K	36	ID	ID	ID	ID	ID	ID
24-05	T	36	ID	ID	ID	ID	ID	ID
24-06	SS1	73	ID	ID	ID	ID	ID	ID
24-07	PS	208	ID	ID	ID	ID	ID	ID
24-08	K	34	ID	ID	ID	ID	ID	ID
24-09	K	36	ID	ID	ID	ID	ID	ID
24-10	K	36	ID	ID	ID	ID	ID	ID
24-11	K	35	ID	ID	ID	ID	ID	ID
24-12	SS1	71	ID	ID	ID	ID	ID	ID
24-13	Corridor	114	ID	ID	ID	ID	ID	ID
24-14	Lift Lobby	24	ID	ID	ID	ID	ID	ID
24-15	Serv. Lift	31	W2	W11	W11	W1	FL5	C5
24-16	FST-1	18	W11	W11	W11	W11	FL6	C5
24-17	FST-2	14	W11	W11	W11	W11	FL6	C5
24-18	Telecom	6	W2	W1	W1	W11	FL5	C5
24-19	EE Rm	4	W2	W11	W11	W11	FL5	C5
24-20	Maid	7	W2	W2	W1	W2	FL1	C3
25-01	Executive Lounge	297	ID	ID	ID	ID	ID	ID
25-02	SS1	73	ID	ID	ID	ID	ID	ID
25-03	SS1/	68	ID	ID	ID	ID	ID	ID
25-04	SS2	138	ID	ID	ID	ID	ID	ID
25-05	SS1	71	ID	ID	ID	ID	ID	ID
25-06	SS1	72	ID	ID	ID	ID	ID	ID
25-07	Pantry	59	KD	KD	KD	KD	FL7 / KD	KD
25-08	Toilet	24	ID	ID	ID	ID	FL7 / ID	ID
25-09	Corridor	83	ID	ID	ID	ID	ID	ID
25-10	Lift Lobby	27	ID	ID	ID	ID	ID	ID
25-11	SERV.	31	W2	W11	W11	W1	FL5	C5
25-12	FST-1	18	W11	W11	W11	W11	FL6	C5
25-13	FST-2	14	W11	W11	W11	W11	FL6	C5
25-14	Telecom	6	W2	W1	W1	W11	FL5	C5
25-15	EE Rm	4	W2	W11	W11	W11	FL5	C5
25-16	Maid Rm.	7	W2	W2	W1	W2	FL1	C3
26-01	Roof Top Restaurant	365	ID	ID	ID	ID	ID	ID
26-02	Cigar Lounge	64	ID	ID	ID	ID	ID	ID
26-03	Outdoor Seating	343	ID	ID	ID	ID	FL7 / ID	ID
26-04	Kitchen	117	KD	KD	KD	KD	FL7 / KD	KD
26-05	Lift Lobby	24	ID	ID	ID	ID	ID	ID
26-06	Serv. Lift	41	W2	W11	W11	W1	FL5	C5
26-07	FST-1	18	W11	W11	W11	W11	FL6	C5
26-08	FST-2	14	W11	W11	W11	W11	FL6	C5
26-09	Telecom	6	W2	W1	W1	W11	FL5	C5
26-10	EE Room	4	W2	W11	W11	W11	FL5	C5
26-11	Corridor	13	ID	ID	ID	ID	ID	ID
26-12	Toilet	21	ID	ID	ID	ID	ID	ID
26-13	Jan.	3	W3	W3	W3	W3	FL1	C3
R-01	Lift Mech. Room	79	W2	W2	W2	W2	FL5	C5
R-02	Water Tank	75	W9	W9	W9	W9	FL7	C5
R-03	Pump Room	33	W2	W9	W2	W2	FL7	C5
R-04	Roof Slab	222					FL7	
R-05	M&E	[illegible]					FL7	
R-06	FST-1	18	W11	W11	W11	W11	FL6	C5
R-07	FST-2					W11	FL6	C5

REV NO	DATE	DESCRIPTION	BY	REV NO	DATE	DESCRIPTION	BY
-	12.03	Final Arch. Design DWG 2019/12/03			09.02	3rd Final Arch. Design DWG 2021/09.02	
	06/23	2nd Final Arch. Design DWG 2020/06/23					
	03/05	2nd Final Arch. Design DWG 2021/03/05					
		PMC comment					

BENGAL hotels & resorts

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

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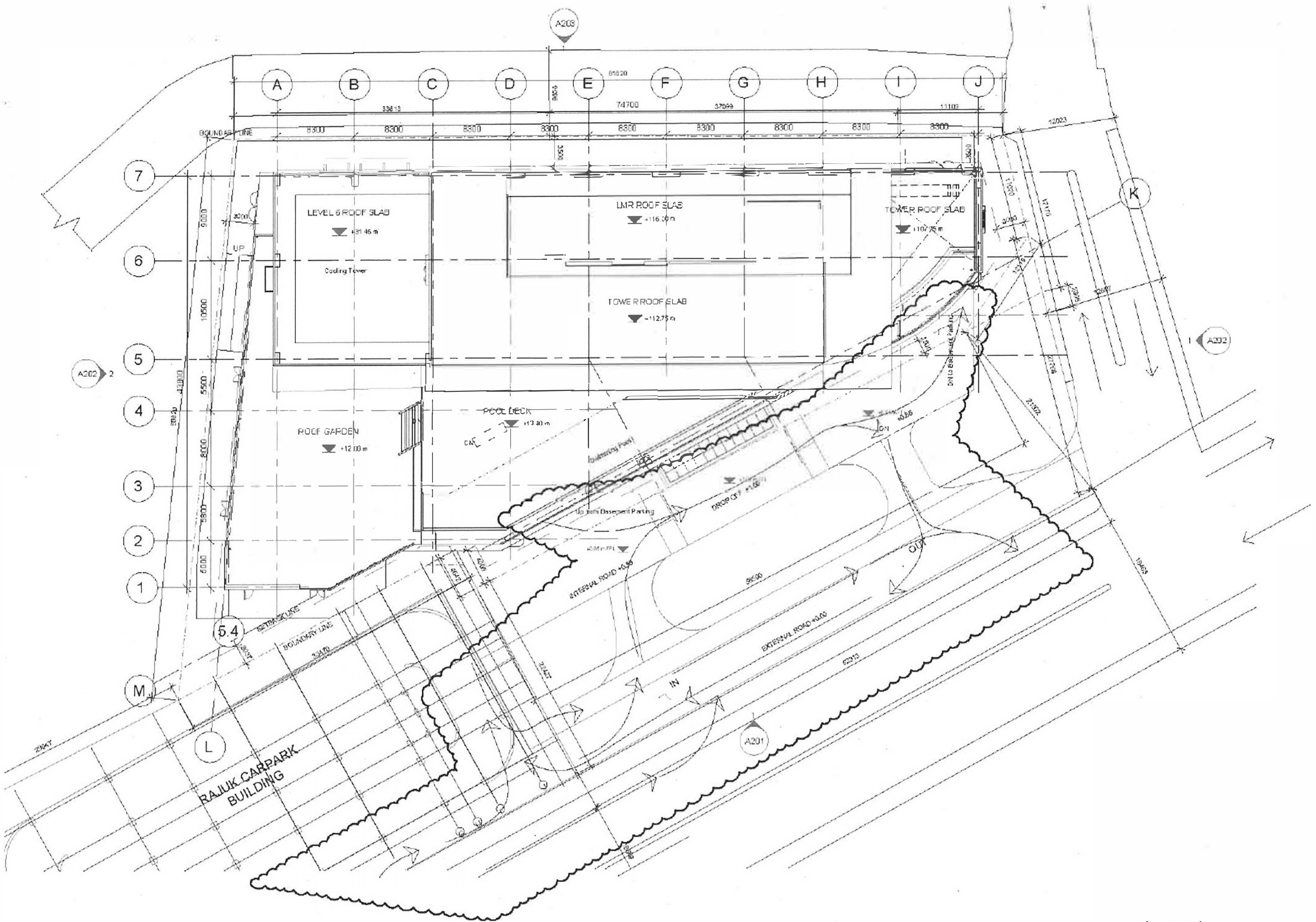
PROJECT: BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE: Room Schedule & Material Finishing

DRAWN BY: ID | CHECKED BY: ID
DESIGNED BY: Sattapanick S. | PROJECT MGR: Chanintorn
DATE: 28.01.2022 | SCALE:
PROJECT NO: 11307
DWG NO: A003

01/28/2022 10:34:07 AM



1 Layout
1 : 250

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REV NO	DATE	DESCRIPTION	BY	REV. NO	DATE	DESCRIPTION	BY
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	06/23	2nd Final Arch Design DWG 2020/06/23					
	03/05	2nd Final Arch Design DWG 2021/03/05					
		PMC comment					

BENGAL hotels & resorts

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BENGAL HOUSE 75 GULSHAN AVENUE, DHAKA 1212 BANGLADESH

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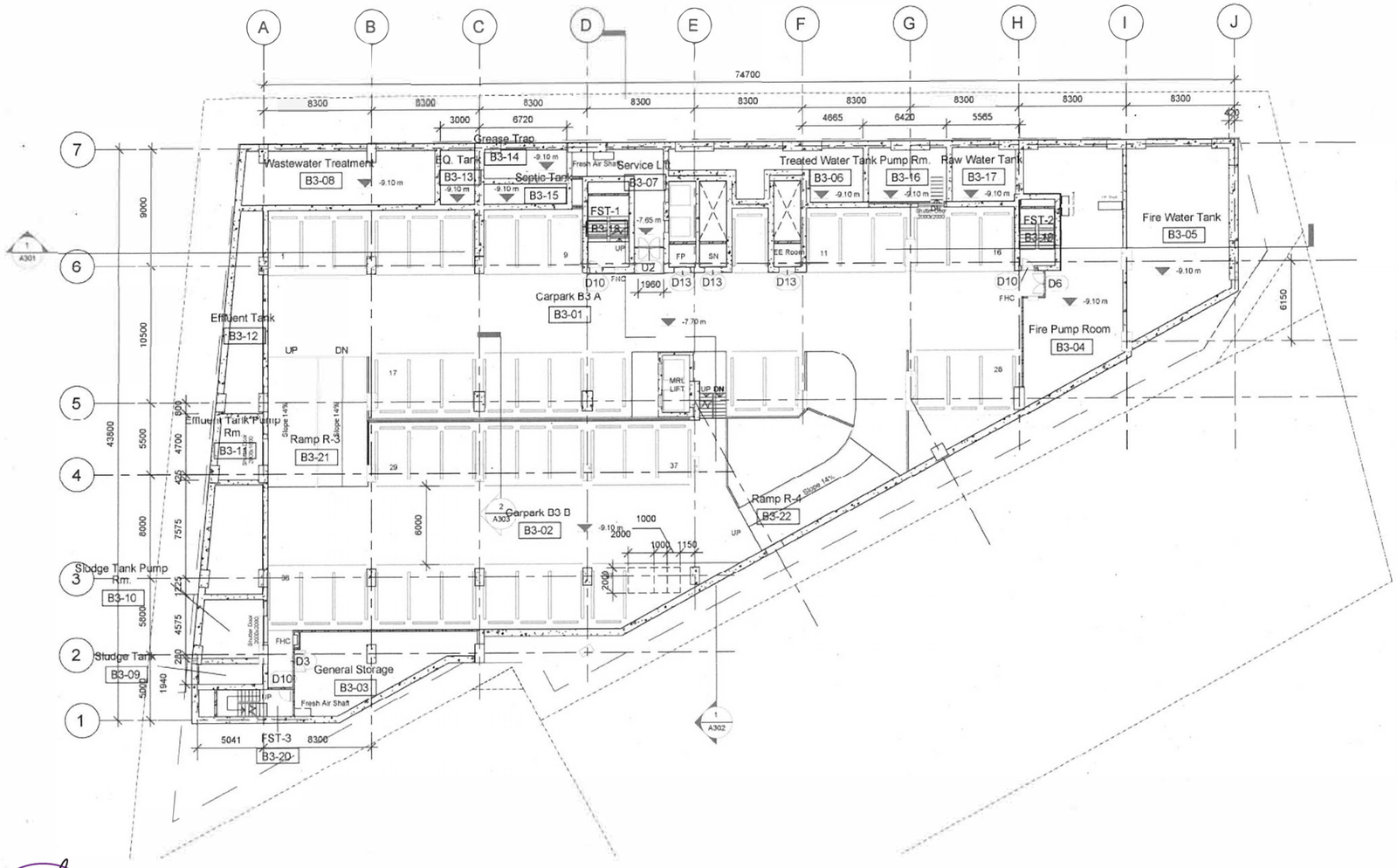
PROJECT	BENGAL HOTELS AND RESORTS A FIVE STAR HOTEL
TITLE	Layout
DRAWN BY	ICI
CHECKED BY	ICI
DESIGN BY	Sathapanick S.
PROJECT MGR.	Chanintorn
DATE	01/10/2021
SCALE	1 : 250
PROJECT NO	113073
DWG NO	A100

11/24/2021 10:45:03 AM



1 Basement 3
1 : 200

-	12/03	Final Arch. Design DWG 2019/12/03			09/02	3rd Final Arch. Design DWG 2021/09/02		
	06/23	2nd Final Arch. Design DWG 2020/06/23						
	03/05	2nd Final Arch. Design DWG 2021/03/05						
		PMC comment						
REV. NO	DATE	DESCRIPTION	BY	REV. NO	DATE	DESCRIPTION	BY	

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BENGAL HOTELS AND RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

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PROJECT:
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE
Basement 3

DRAWN BY	IDL
CHECKED BY	IDL
DESIGN BY	Sathapanick S.
PROJECT MGR	Chanintorn
DATE	01/10/2021
SCALE	1 : 200
PROJECT NO.	113073
DWG NO	A101

Deltadesh Pvt. Ltd. Dhaka

P:\113073_BENGAL_HOTEL\Drawings\A\ 12 Updated Fina Architectural design Drawing on 16-08-2023 (Autocad file Level 1-3 only by IDL)\Swissotel L1-3 CAD\A101 - Basement 3.dwg, 17/8/2023 08:07:51, AutoCAD PDF (High Quality Print).pc3

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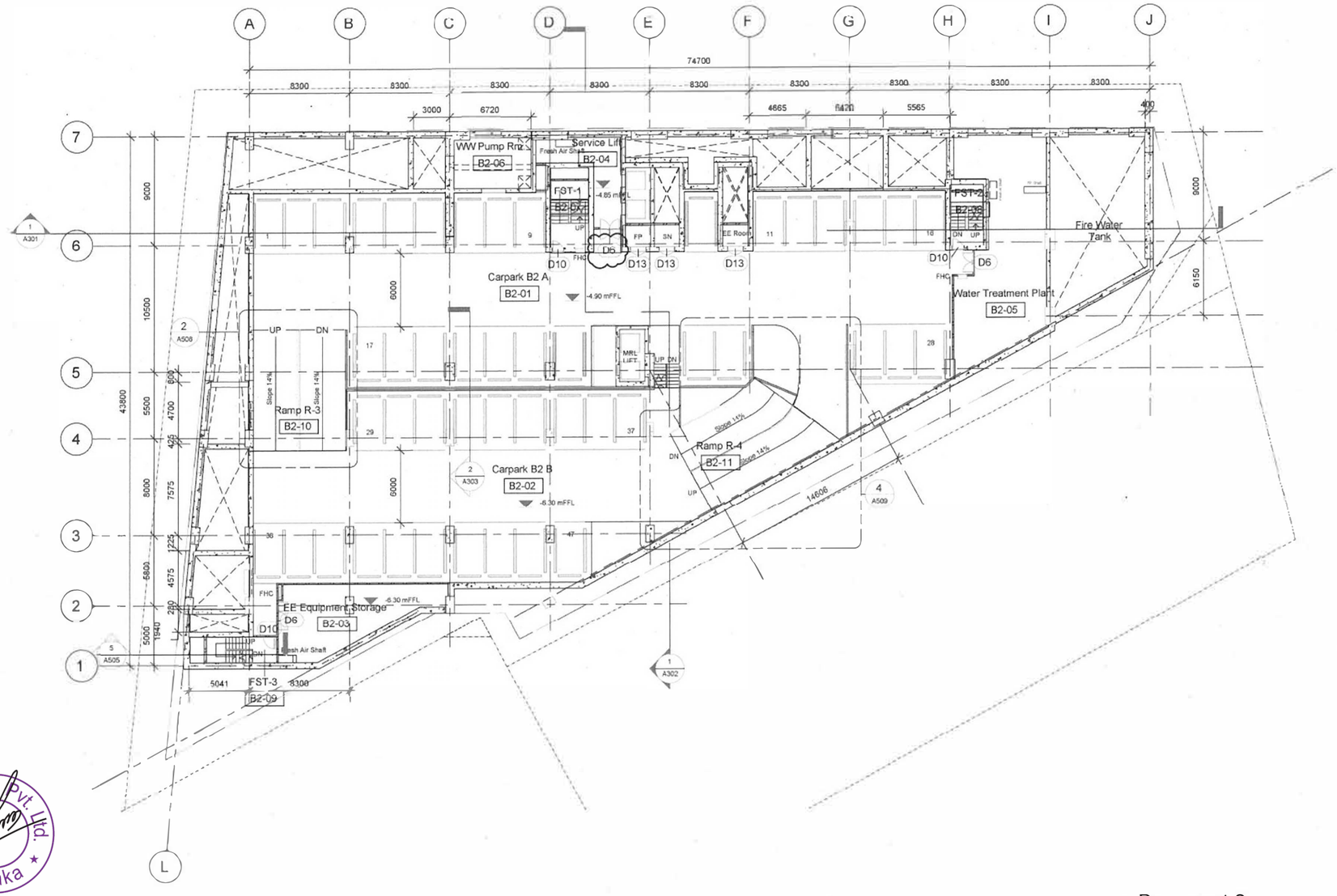

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1 Basement 2
1 : 200

BENGAL hotels & resorts

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BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV NO.	DATE	DESCRIPTION	BY
-	12/03	Final Arch Design DWG 2019/12/03	
	06/23	2nd Final Arch Design DWG 2020/06/23	
	03/05	2nd Final Arch Design DWG 2021/03/05	
		PMC comment	

REV NO.	DATE	DESCRIPTION	BY
	09/02	3rd Final Arch Design DWG 2021/09/02	

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E-mail: interdes331@gmail.com

PROJECT:
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE
Basement 2

DRAWN BY	IDL
CHECKED BY	IDL
DESIGN BY	Sathapanick S.
PROJECT MGR.	Chanintorn
DATE	01/10/2021
SCALE	1 : 200
PROJECT NO.	113073
DWG NO.	A102

P:\113073_BENGAL_HOTEL\Drawings\A\ 12 Updated Final Architectural design Drawing on 16-08-2023 (Autocad file Level 1-3 only by IDL)\Swissotel L1-3 CADA102 - Basement 2.dwg, - 7/8/2023 08:07:36, AutoCAD PDF (High Quality Print).pc3

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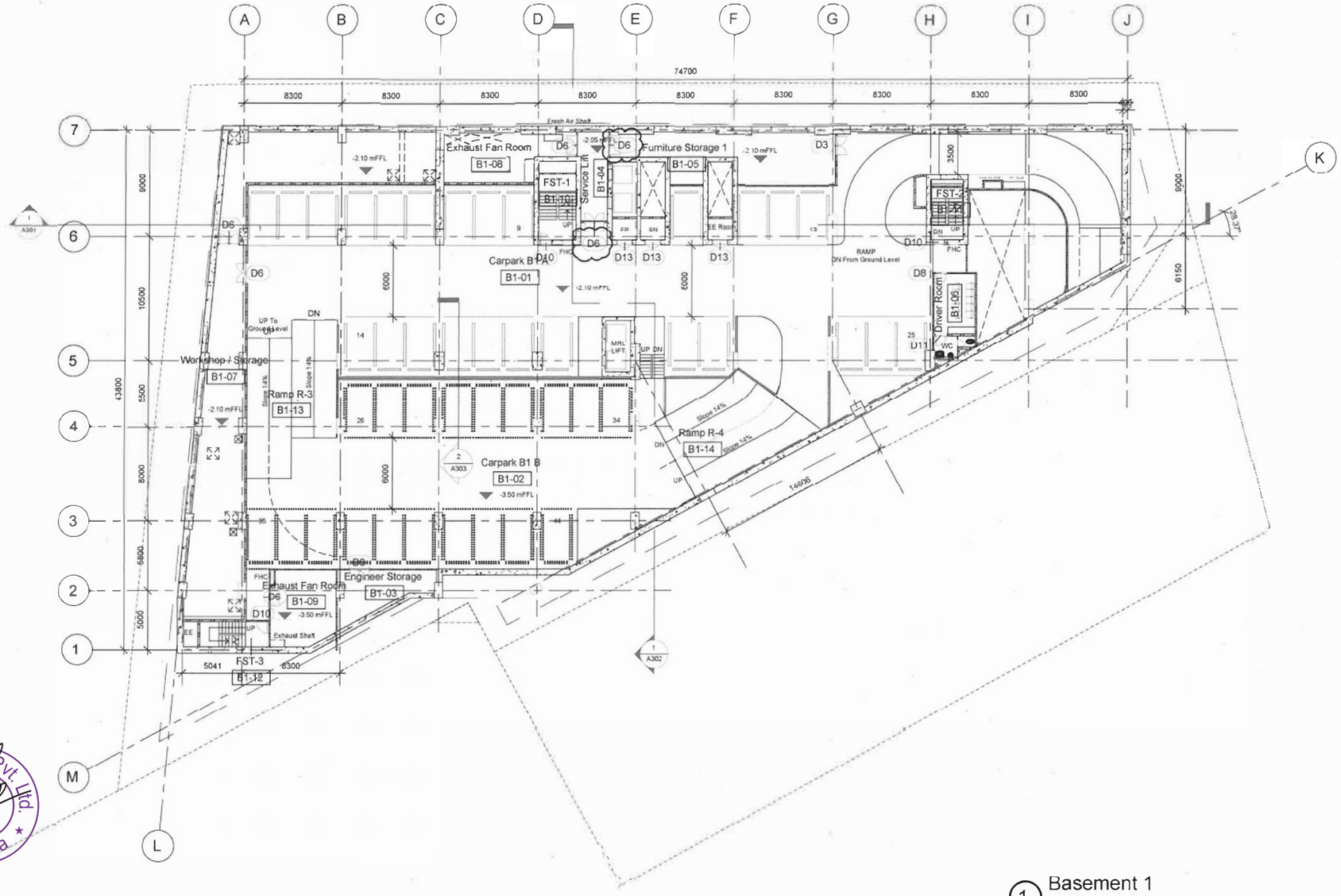

1 Basement 1
1 : 200

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BENGAL hotels & resorts	BENGAL HOTELS AND RESORTS LIMITED BENGAL HOUSE 75 GULSHAN AVENUE DHAKA 1212 BANGLADESH	-	12/03	Final Arch. Design DWG 2019/12/03		09/02	3rd Final Arch. Design DWG 2020/09/02	
			06/23	2nd Final Arch. Design DWG 2020/06/23				
			03/05	2nd Final Arch. Design DWG 2021/03/05				
				PMC comment				
		REV. NO	DATE	DESCRIPTION	BY	REV. NO	DATE	DESCRIPTION

DYNAMIC ENGINEERING CONSULTANTS CO., LTD
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PROJECT
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE
Basement 1

DRAWN BY	IDL
CHECKED BY	IDL
DESIGN BY	Sathapanick S.
PROJECT MGR	Chanintorn
DATE	01/10/2021
SCALE	1 : 200
PROJECT NO.	113073
DWG NO	A103

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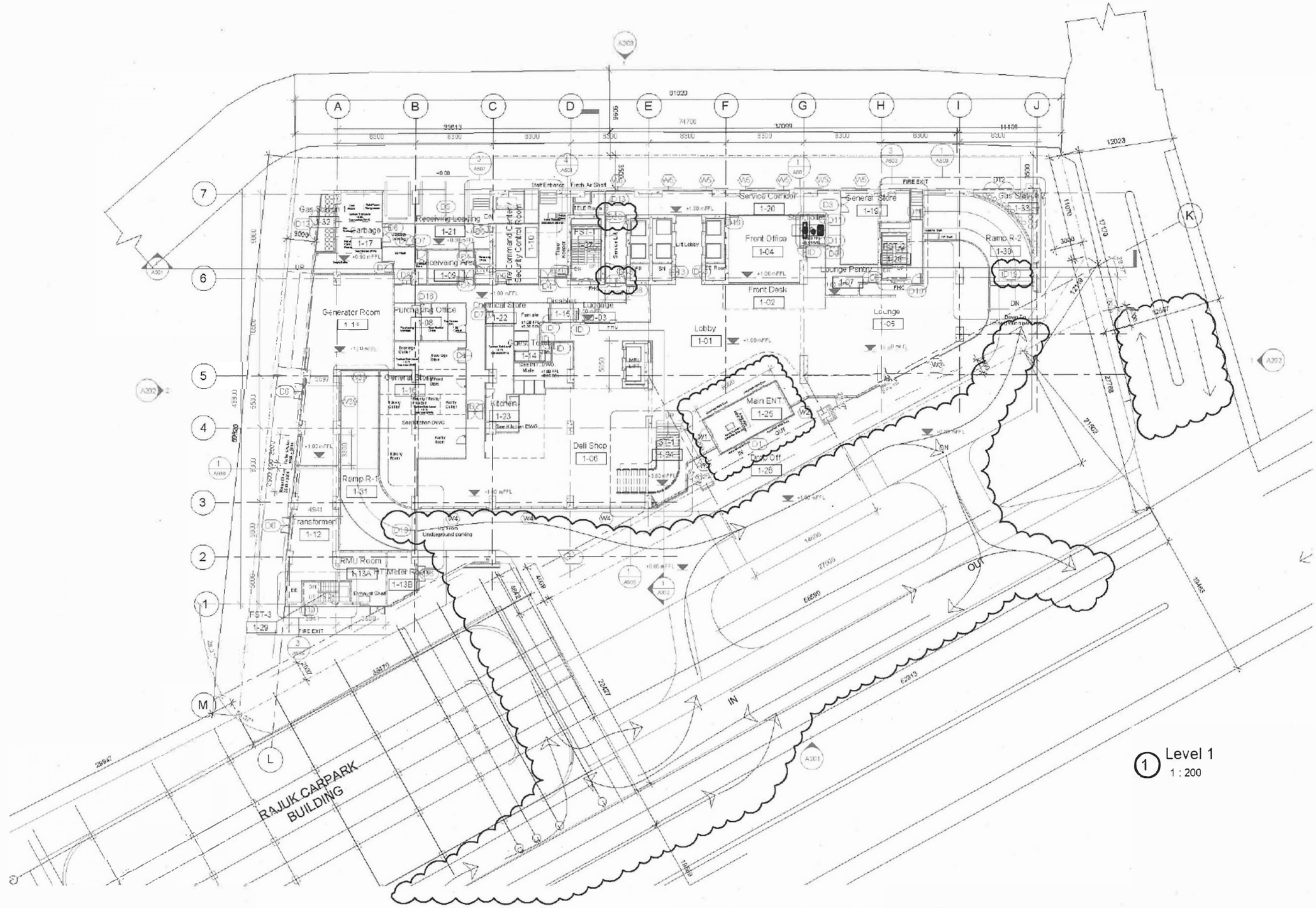

Level 1
1 : 200

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Dhaka

BENGAL
hotels & resorts

BENGAL HOTELS AND RESORTS LIMITED
BENGAL HOUSE, 75 GULSHAN AVENUE,
DHAKA 1212 BANGLADESH

REV NO	DATE	DESCRIPTION	BY	REV. NO	DATE	DESCRIPTION	BY
-	12/03	Final Arch Design DWG 2019/12/03			09/02	3rd Final Arch Design DWG 2020/09/02	
	06/23	2nd Final Arch Design DWG 2020/06/23					
	03/05	2nd Final Arch Design DWG 2021/03/05					
		PMC comment					

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PROJECT
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE
Level 1Floor Plan

DRAWN BY: IDL	CHECKED BY: IDL
DESIGN BY: Sathapanick S	PROJECT MGR.: Chanintorn
DATE: 28/01/2022	SCALE: 1 : 200
PROJECT NO: 113073	
DWG NO: A104	

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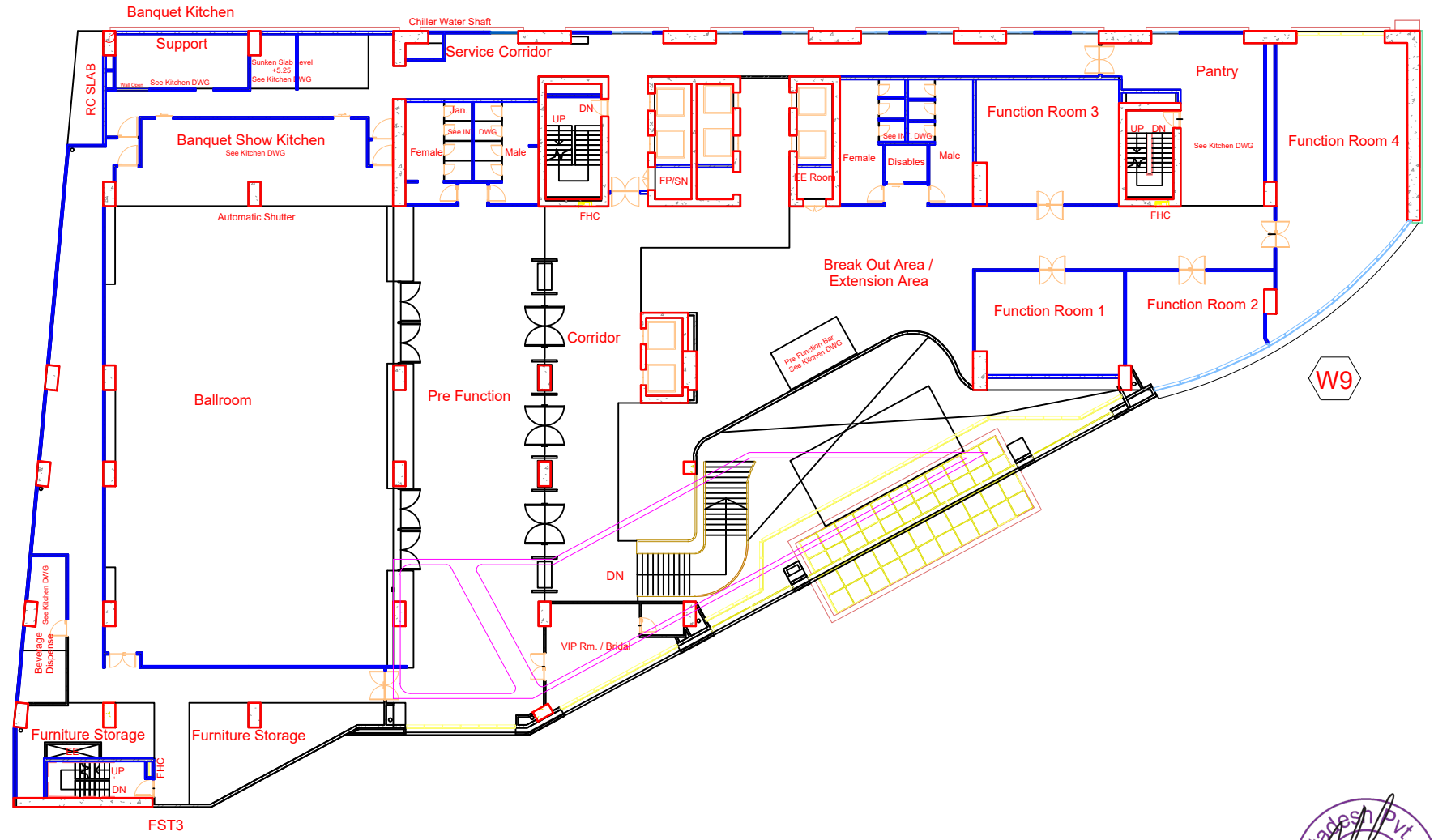

LEVEL 02

SCALE 1:300

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BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

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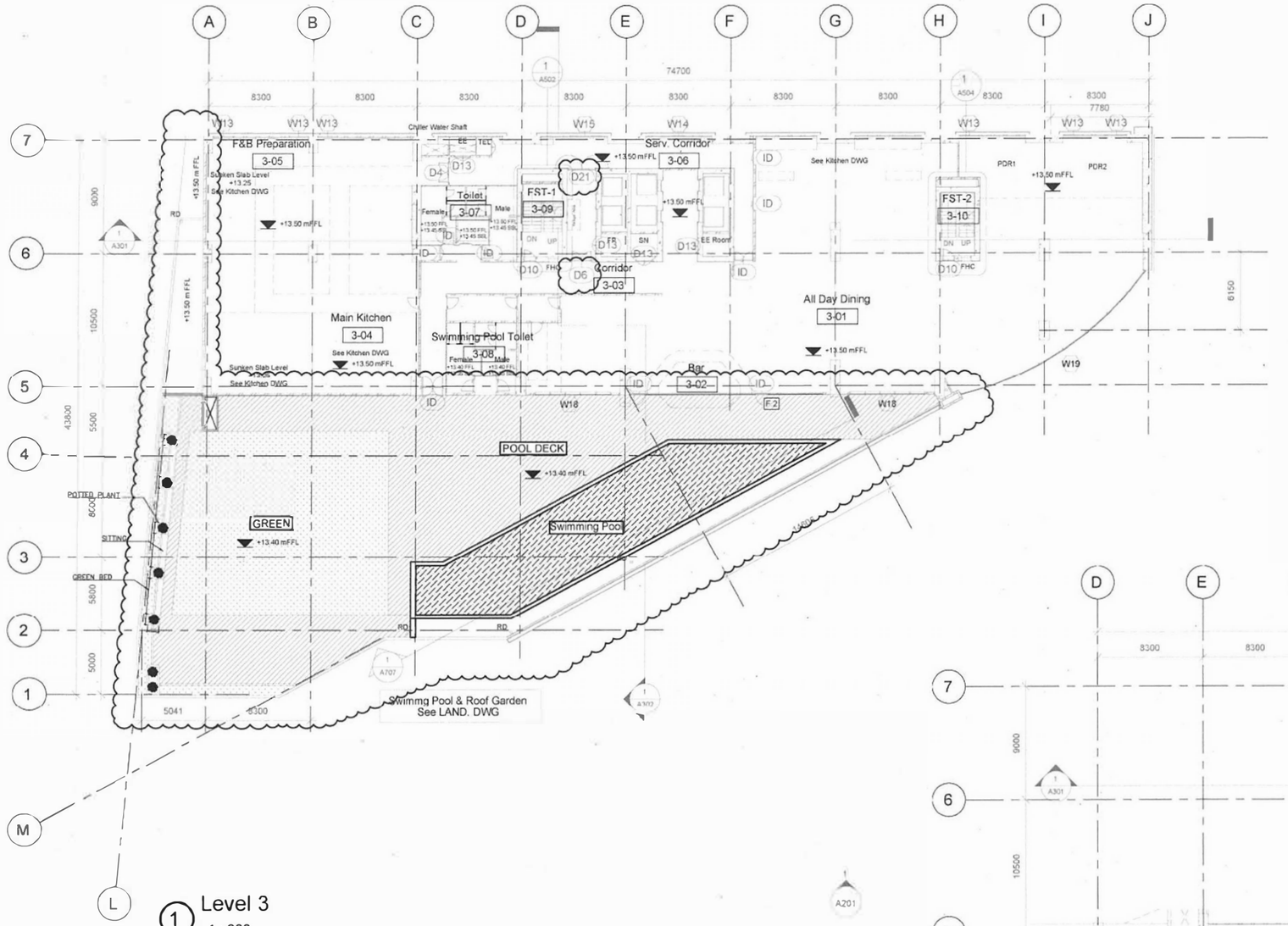
4WALLS inside outside
HOUSE NO. 264, ROAD NO. 19, NEW DOHS,
MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
Ph: +8801711433431, +8801710912353

PROJECT:
A FIVE STAR HOTEL
TITLE :
WINDOW DETAIL

DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	



1 Level 3
1 : 200

2 Surge Tank Level
1 : 200

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BENGAL HOTELS AND RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY
-	12/03	Final Arch. Design DWG 2019/12/03	
	06/23	2nd Final Arch. Design DWG 2020/06/23	
	03/05	2nd Final Arch. Design DWG 2021/03/05	
		PMC comment	

REV. NO.	DATE	DESCRIPTION	BY
	09/02	3rd Final Arch. Design DWG 2021/09/02	

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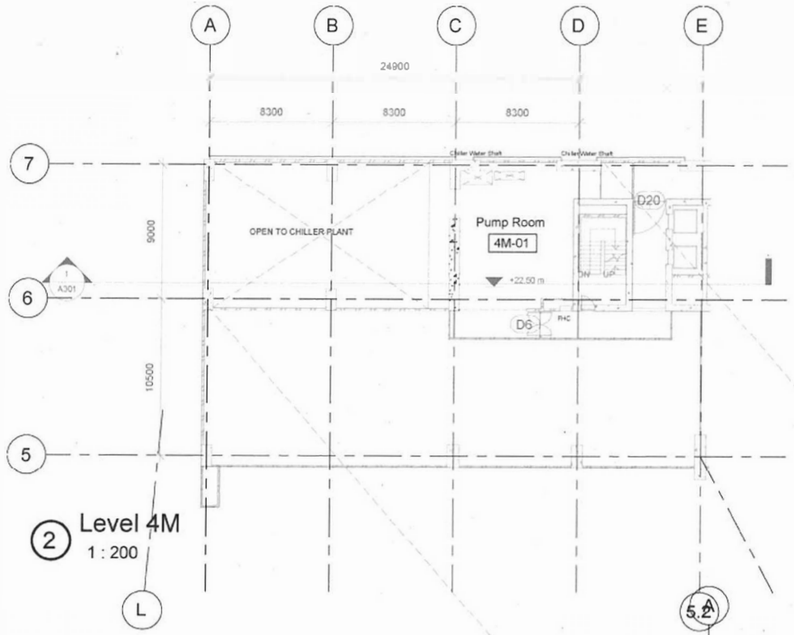
PROJECT
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE
Level 3 Floor Plan

DRAWN BY	IDL
DESIGN BY	Sathapanick S.
DATE	28/01/2022
CHECKED BY	IDL
PROJECT MGR	Chanintorn
SCALE	1 : 200
PROJECT NO	113073
DWG NO	A106



2 Level 4M
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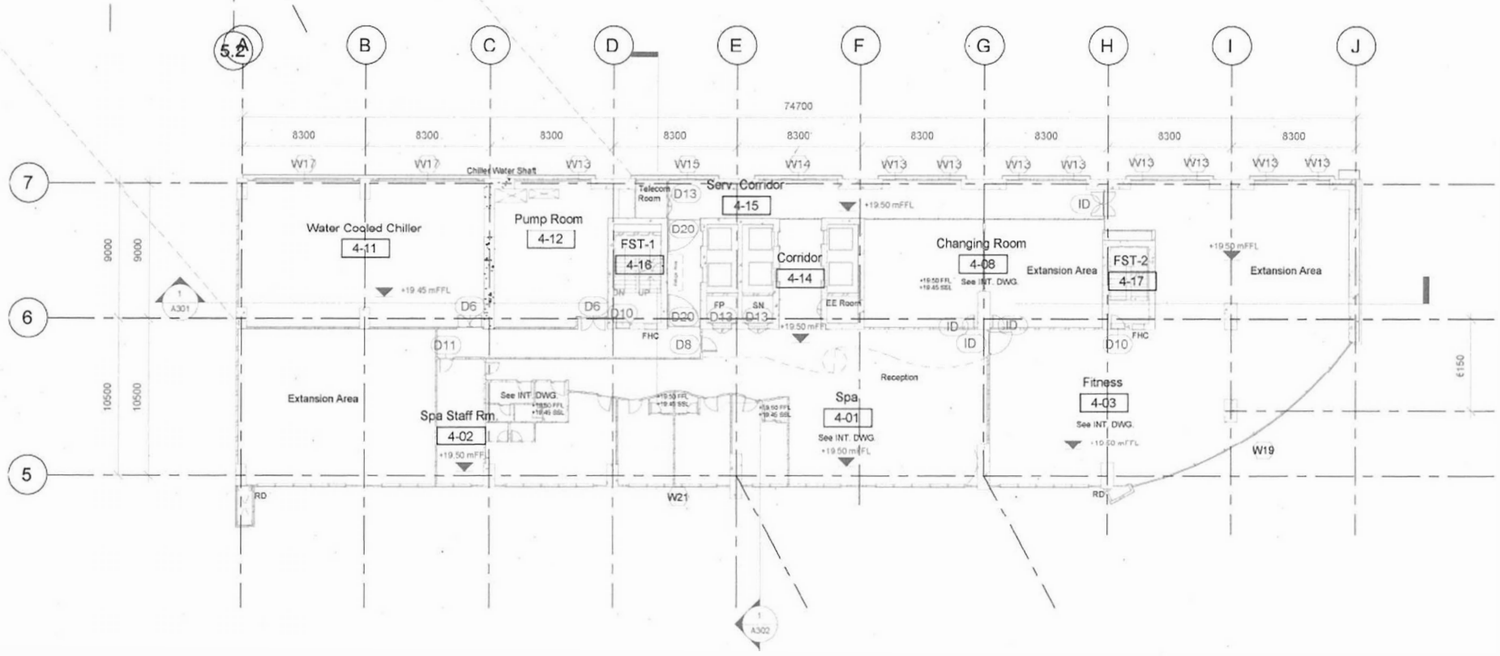

1 Level 4
1 : 200

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REV NO	DATE	DESCRIPTION	BY	REV NO	DATE	DESCRIPTION	BY
-	12/03	Final Arch Design DWG 2019/12/03			09/02	3rd Final Arch Design DWG 2021/09/02	
	06/23	2nd Final Arch Design DWG 2020/06/23					
	03/05	2nd Final Arch Design DWG 2021/03/05					
		PMC comment					

BENGAL hotels & resorts
BENGAL HOTELS AND RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

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PROJECT
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE
Level 4 Floor Plan

DRAWN BY	IDL
CHECKED BY	IDL
DESIGN BY	Sathapanick S
PROJECT MGR	Chanintorn
DATE	28/01/2022
SCALE	1:200
PROJECT NO	113073
DWG NO	A107

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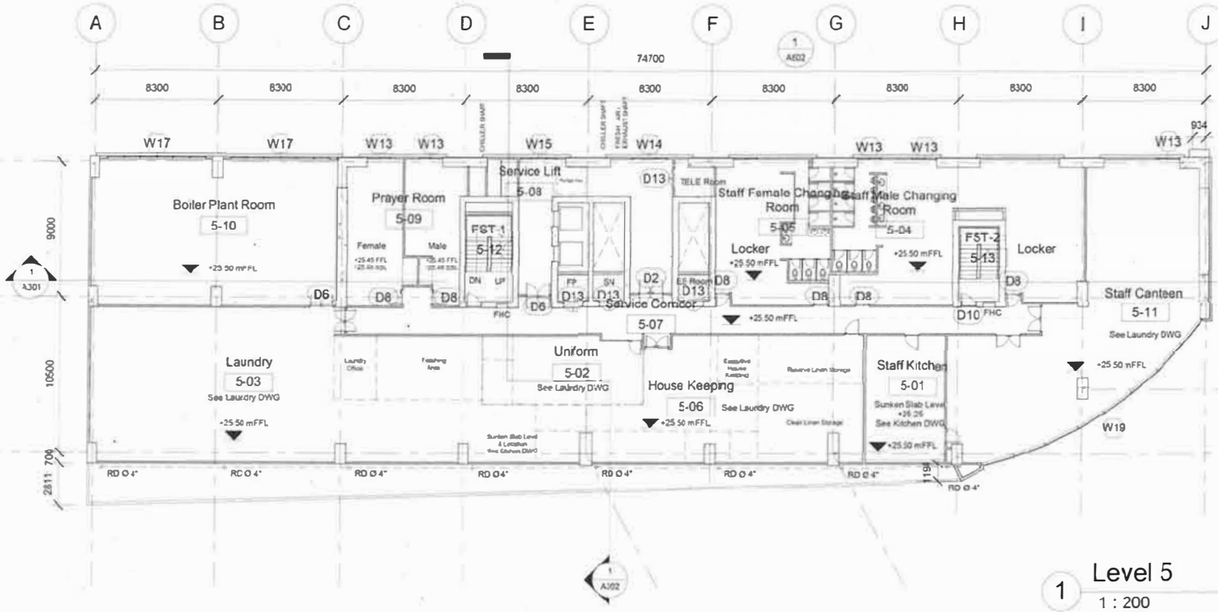

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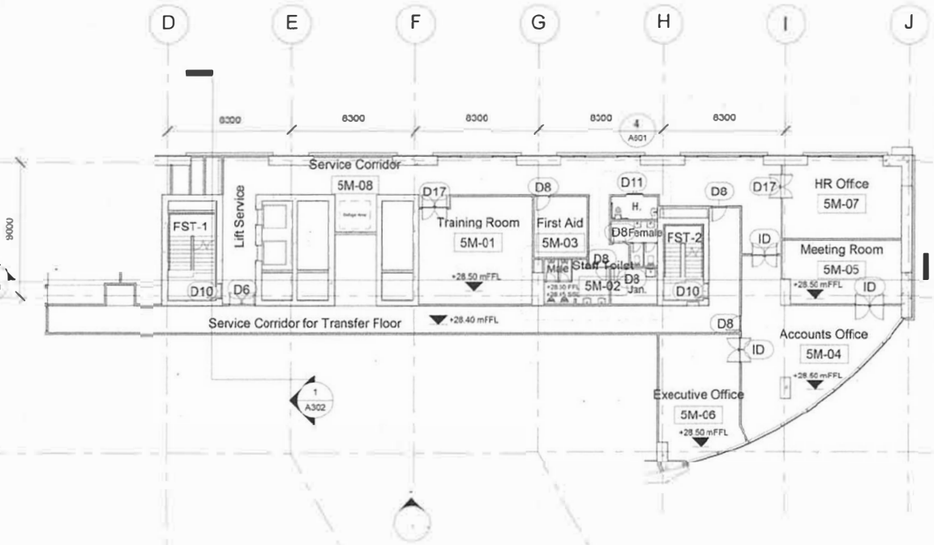

3 Level 5M Transfer Floor
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4 RC Platform
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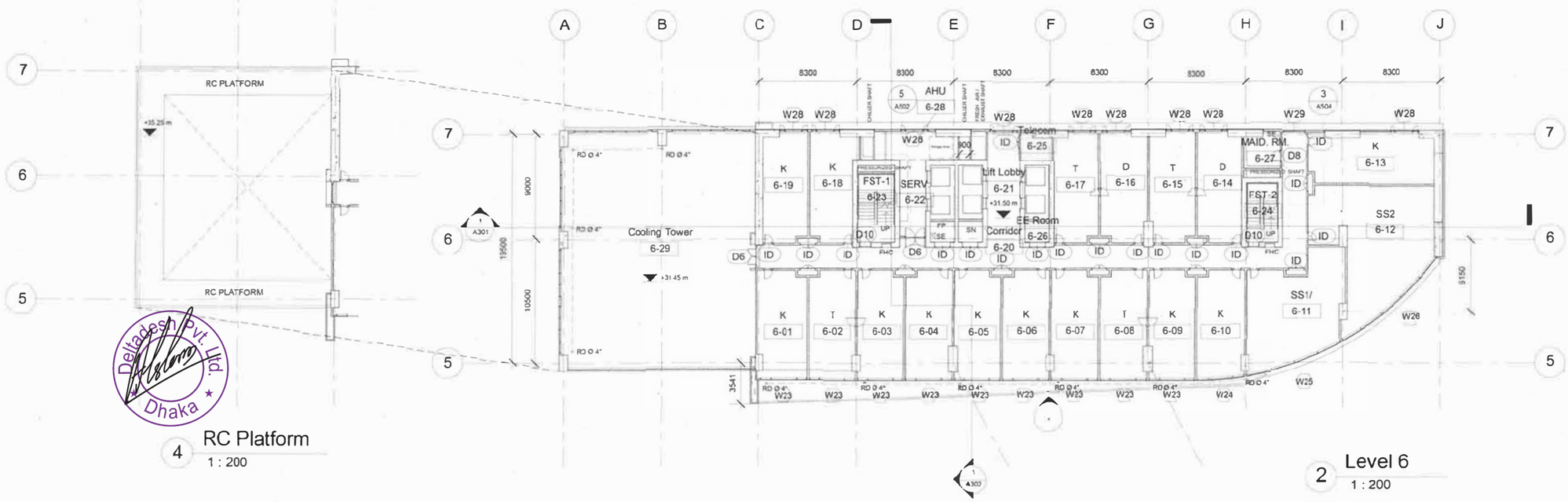

2 Level 6
1 : 200

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BENGAL HOTELS & RESORTS UNITED
BENGAL HOUSE 75 KAMAL ATATURK AVENUE DHAKA 1212 BANGLADESH

REV NO	DATE	DESCRIPTION	BY
-	12/03	Final Arch. Design DWG 2019/12/03	
	06/23	2nd Final Arch. Design DWG 2020/06/23	
	03/05	2nd Final Arch. Design DWG 2021/03/05	
		PMC comment	
09/02		3rd Final Arch. Design DWG 2021/09/02	

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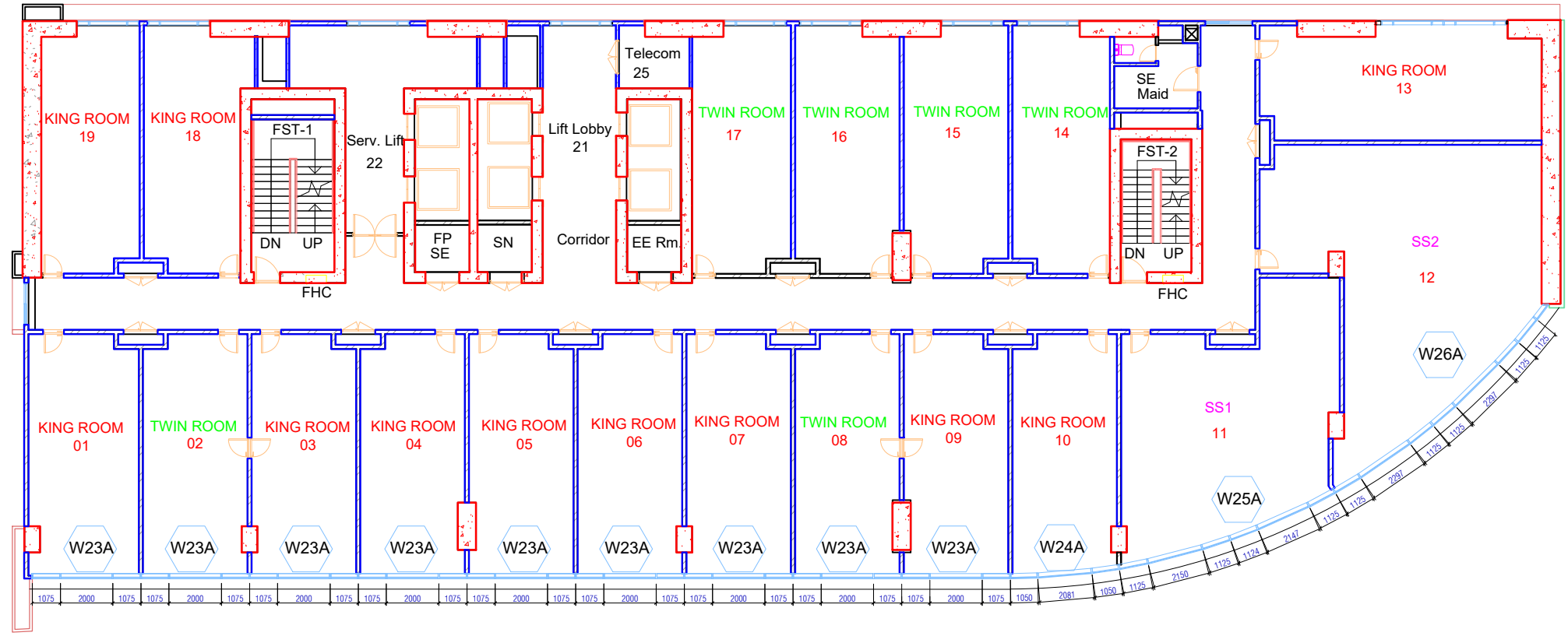
E-mail: interdes33*@gmail.com

PROJECT
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE
Level 5,6 Floor Plan

DRAWN BY	IDL
CHECKED BY	IDL
DESIGN BY	Sathapanick S.
PROJECT MGR	Chanintorn
DATE	28/01/2022
SCALE	1 : 200
PROJECT NO	113073
DWG NO	A108

8/4/2023 3:43:42 PM



N

LEVEL 7-21

SCALE 1:200

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BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

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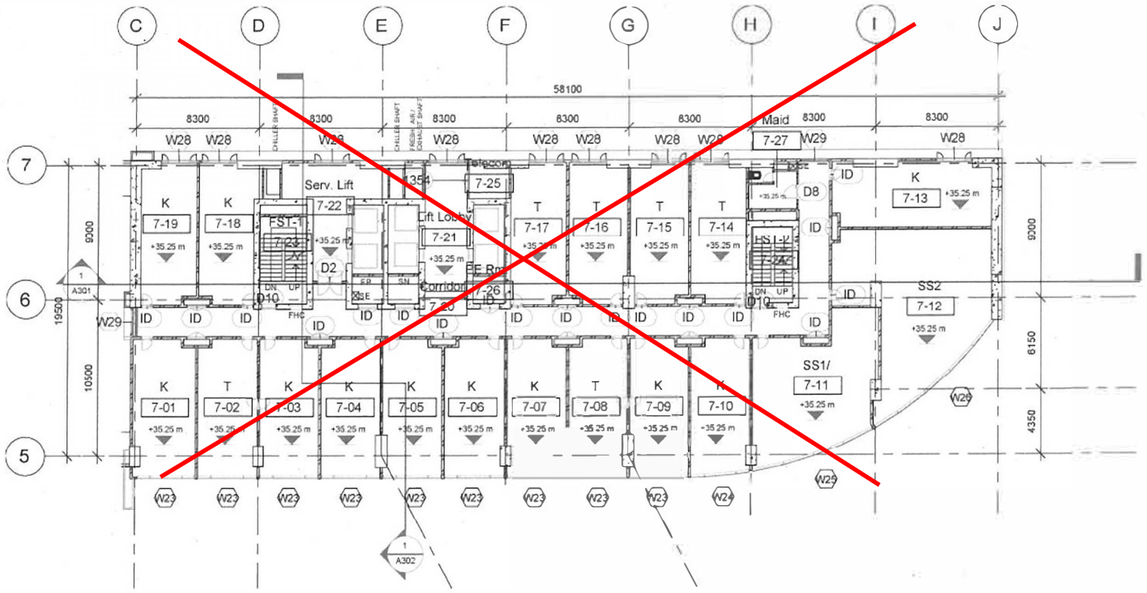
4WALLS inside outside
HOUSE NO. 264, ROAD NO. 19, NEW DOHS,
MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
Ph: +8801711433431, +8801710912353

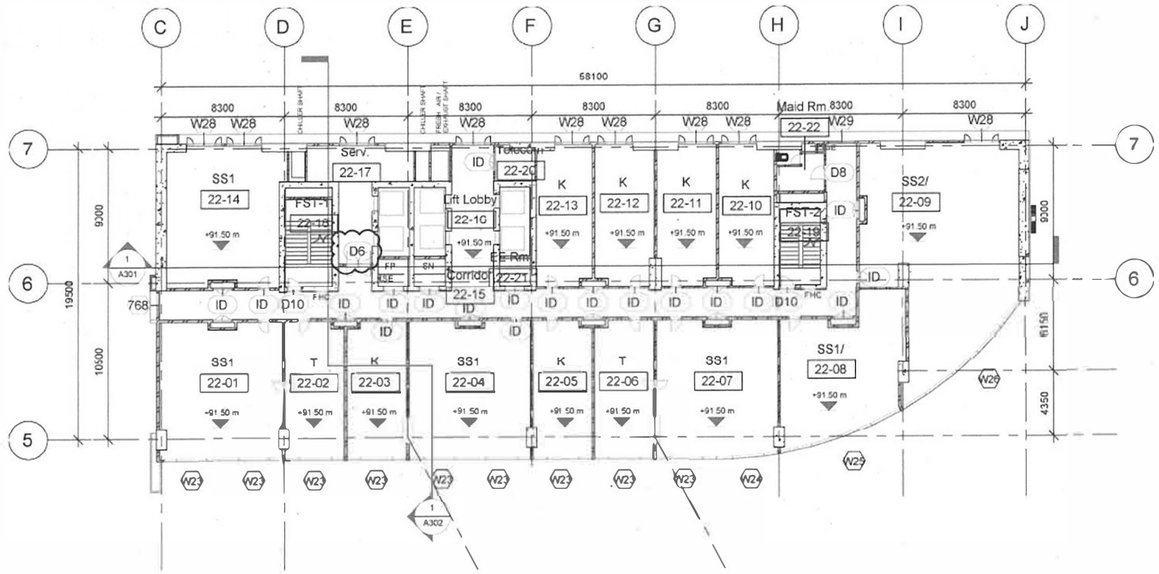
PROJECT:
A FIVE STAR HOTEL

TITLE :
WINDOW DETAIL

DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	



1 Level 7-21
1 : 200



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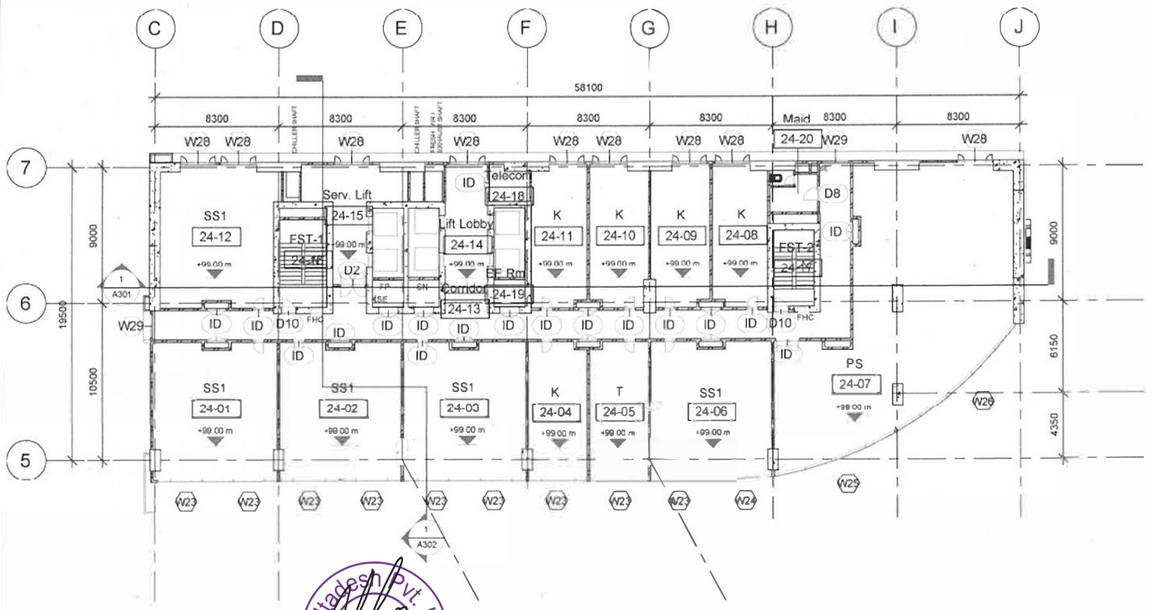

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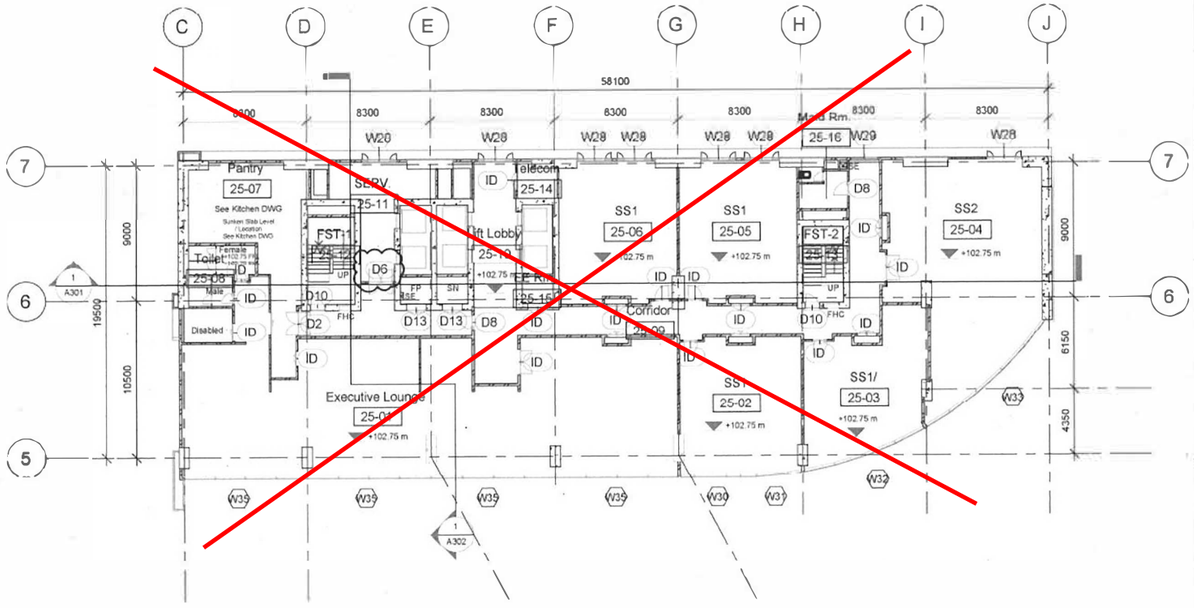

4 Level 25
1 : 200

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BENGAL hotels & resorts

BENGAL HOTELS AND RESORTS LIMITED

BENGAL HOUSE 75 GULSHAN AVENUE, DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY
-	12/03	Final Arch. Design DWG 2019/12/03			09/02	3rd Final Arch. Design DWG 2021/09/02	
	06/23	2nd Final Arch. Design DWG 2020/06/23					
	03/05	2nd Final Arch. Design DWG 2021/03/05					
		PMC comment					

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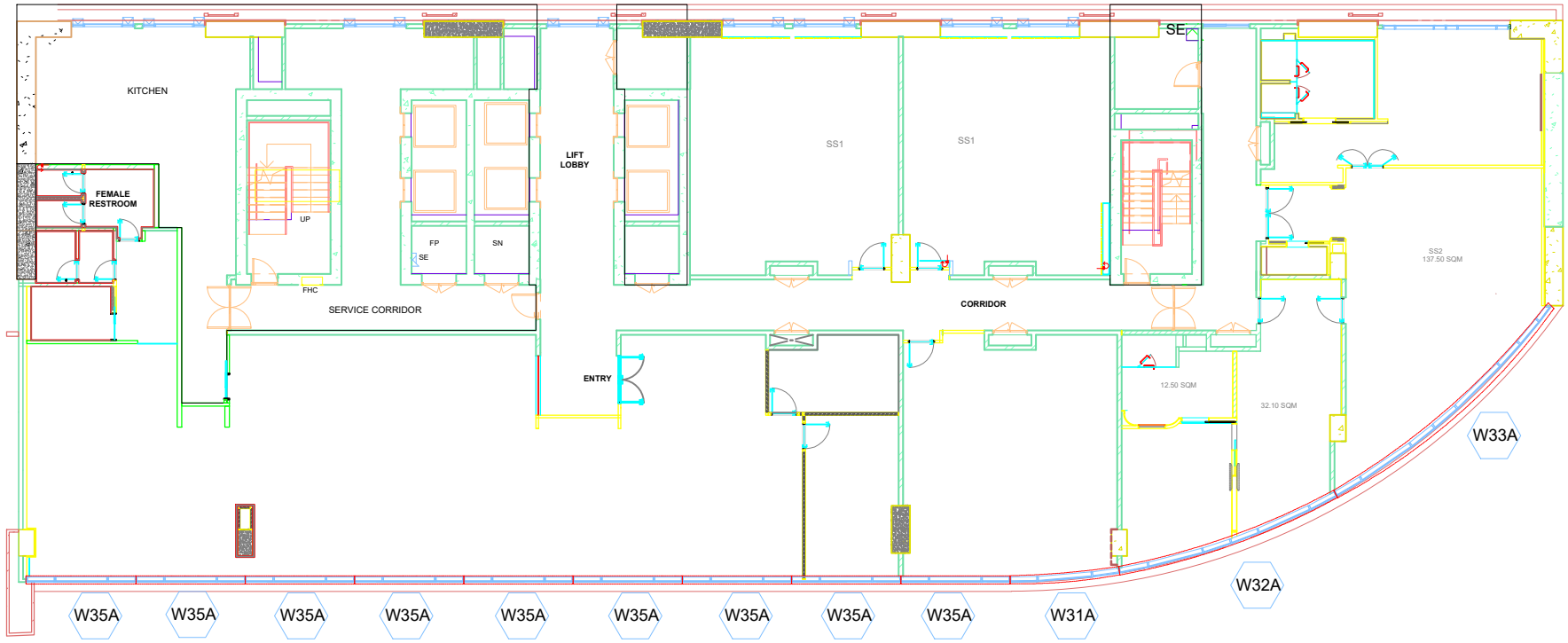
PROJECT
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE
Level 7-25 Floor Plan

DRAWN BY	IDL
CHECKED BY	IDL
DESIGN BY	Sathapanick S.
PROJECT MGR	Chanintorn
DATE	01/10/2021
SCALE	1 : 200
PROJECT NO.	113073
DWG NO	A109

P:\113073_BENGAL_HOTEL\Drawings\A. 1) Updated Final Architectural design Drawing on 16-08-2023\ Autocad file\ Level 1-3 only by IDL\Swissotel L1-3 CADA109 - Level 7-25 Floor Plan.dwg, 17/8/2023 06:08:42, AutoCAD PDF (High Quality Print).pc3

11/24/2021 11:00:18 AM



LEVEL 25

SCALE:1:200

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BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

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MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
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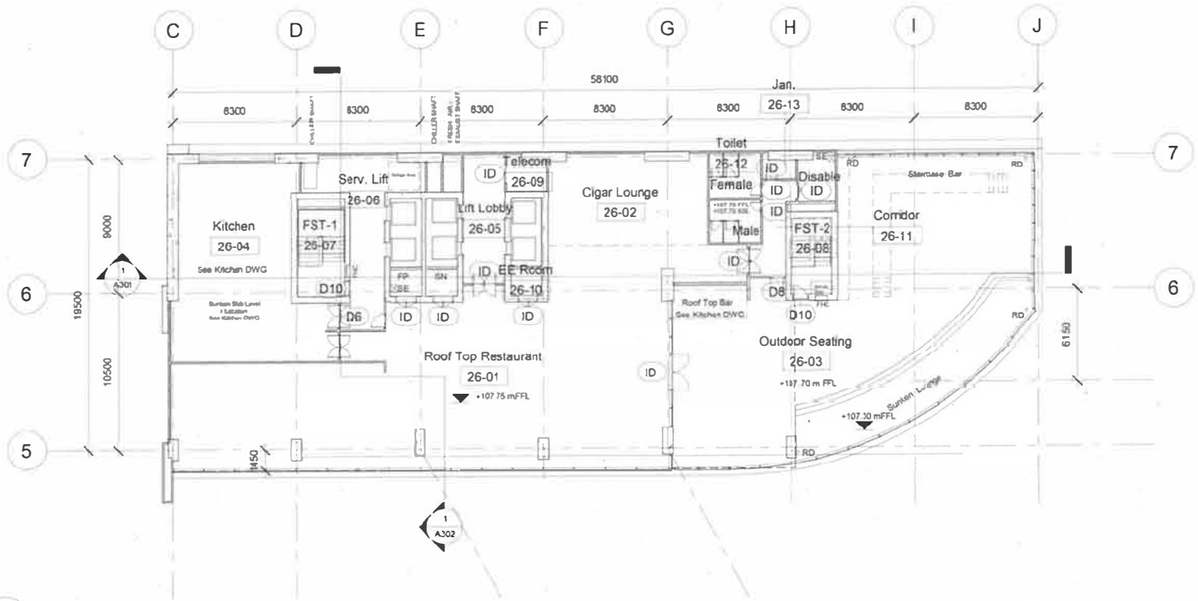
PROJECT:
A FIVE STAR HOTEL

TITLE :
WINDOW DETAIL

DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :

PROJECT NO.
DWG.NO



1 Level 26
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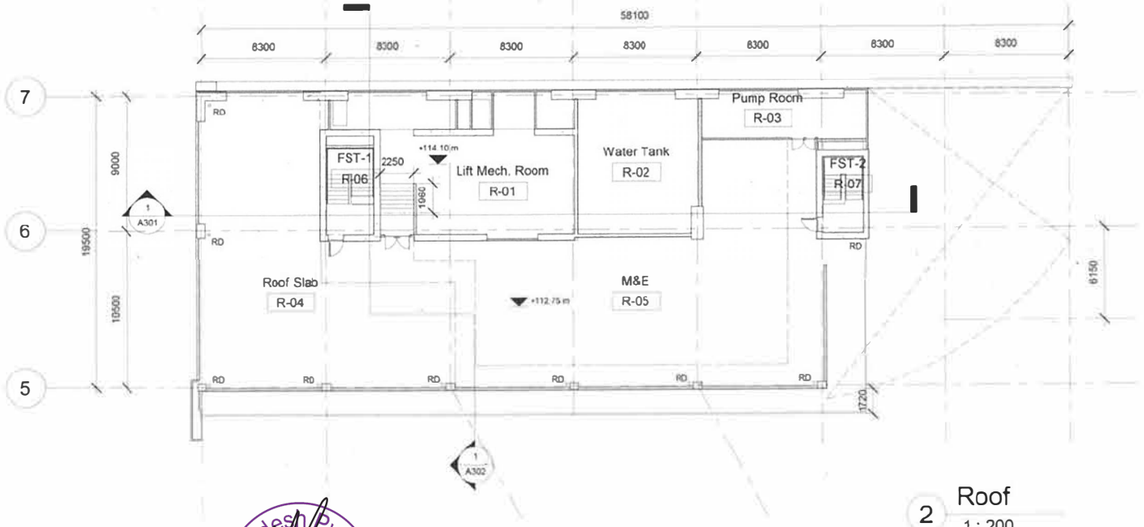
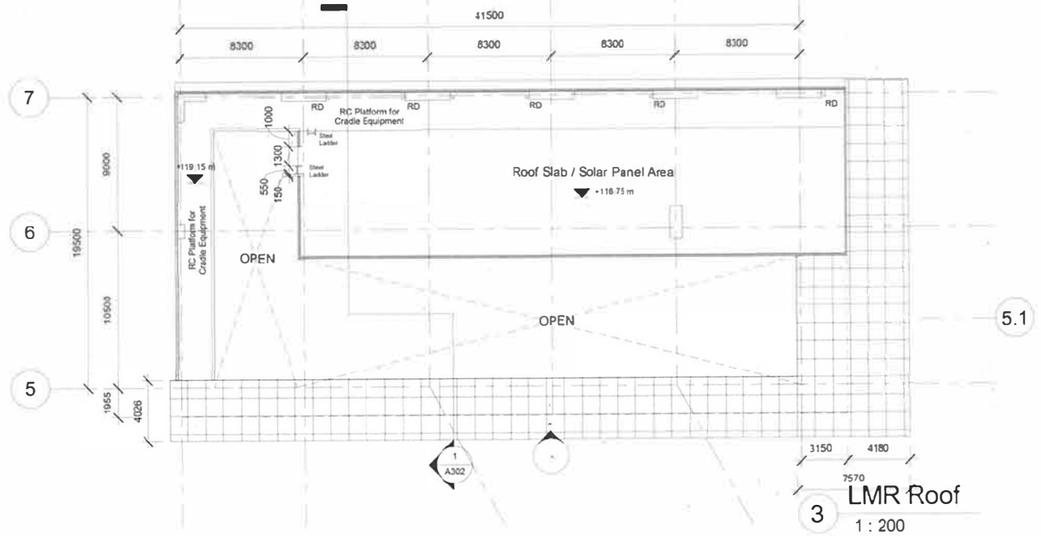


2 Roof
1 : 200



3 LMR Roof
1 : 200

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BENGAL hotels & resorts
BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 74 GULSHAN AVENUE DHAKA 1212 BANGLADESH

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-	12/03	Final Arch. Design DWG 2019/12/03			09/02	3rd Final Arch. Design DWG 2021/09/02	
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	03/05	2nd Final Arch. Design DWG 2021/03/05					
		PMC comment					

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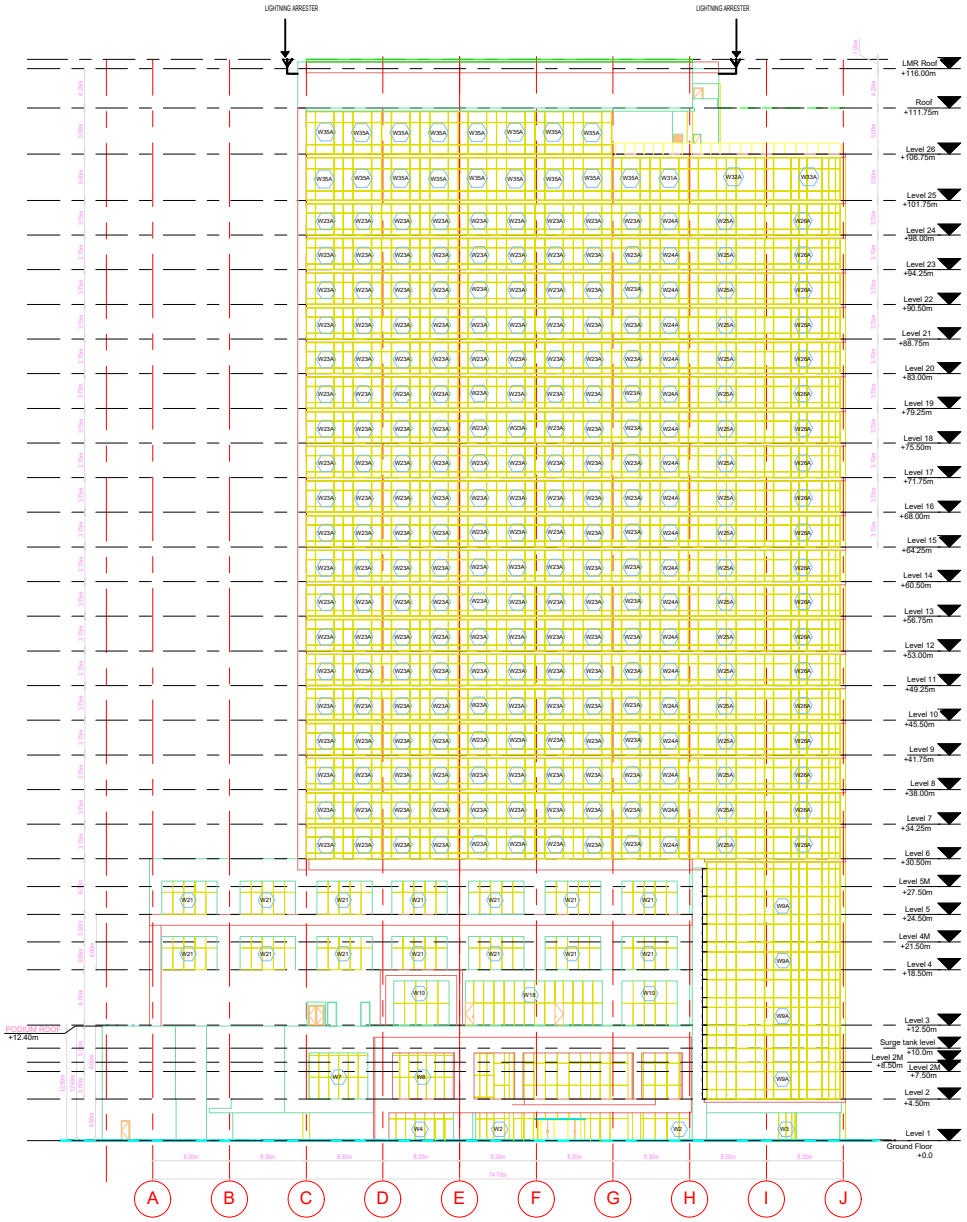
PROJECT
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE
LEVEL 26 -Roof Plan

DRAWN BY	IDL	CHECKED BY	IDL
DESIGN BY	Sathapanick S	PROJECT MGR	Chanintorn
DATE	28/01/2022	SCALE	1 : 200
PROJECT NO	113073		
DWG NO	A110		

8/4/2023 3:43:59 PM



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BENGAL HOTELS & RESORTS LIMITED

BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

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PROJECT:

A FIVE STAR HOTEL

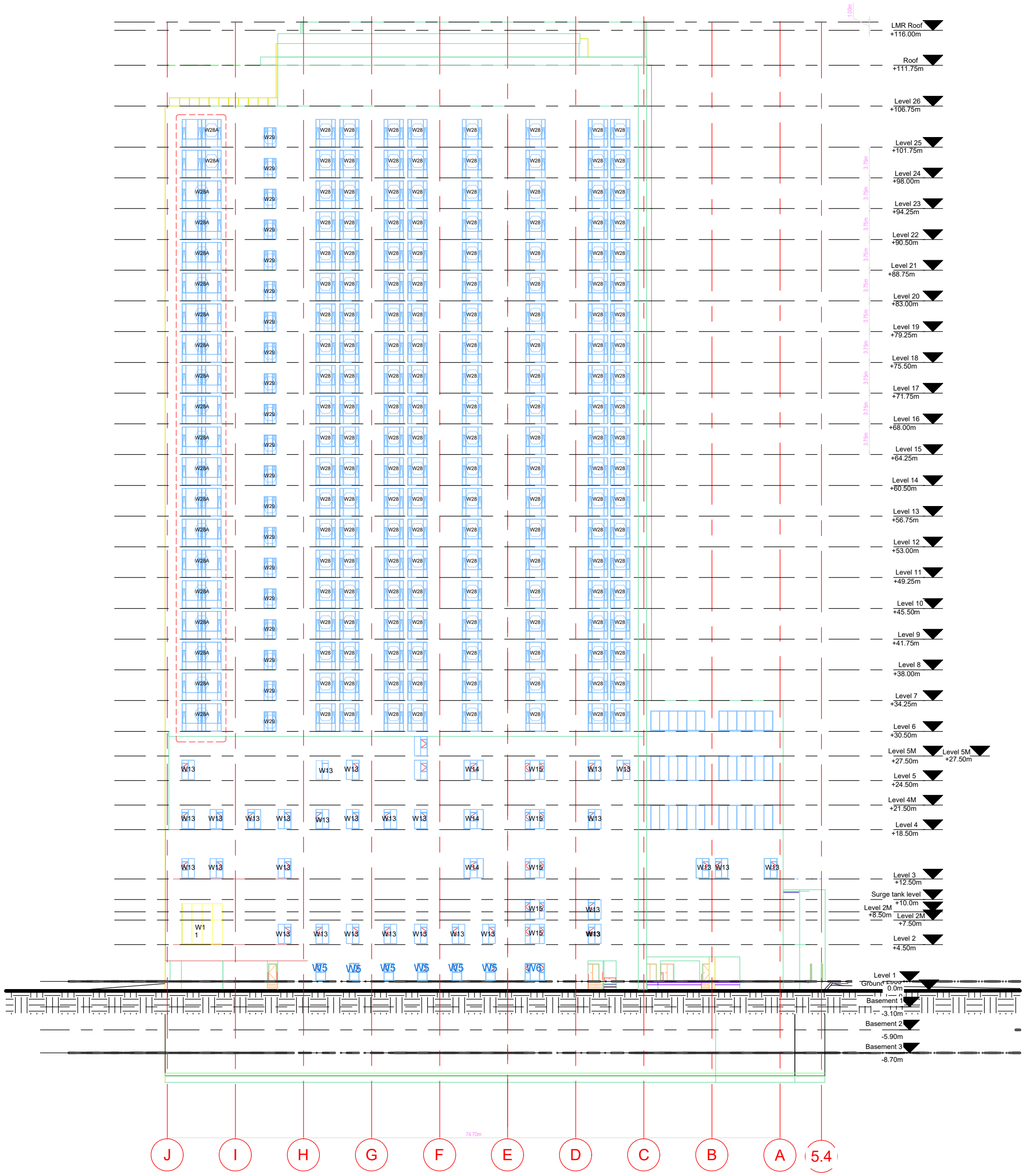
TITLE :

WINDOW DETAIL

DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :

PROJECT NO.

DWG.NO



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E:\SWISSOTEL\20230725_SWISSOTEL\4WALLS_PLAN\Final Logo.jpg

BENGAL HOTELS & RESORTS LIMITED

BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

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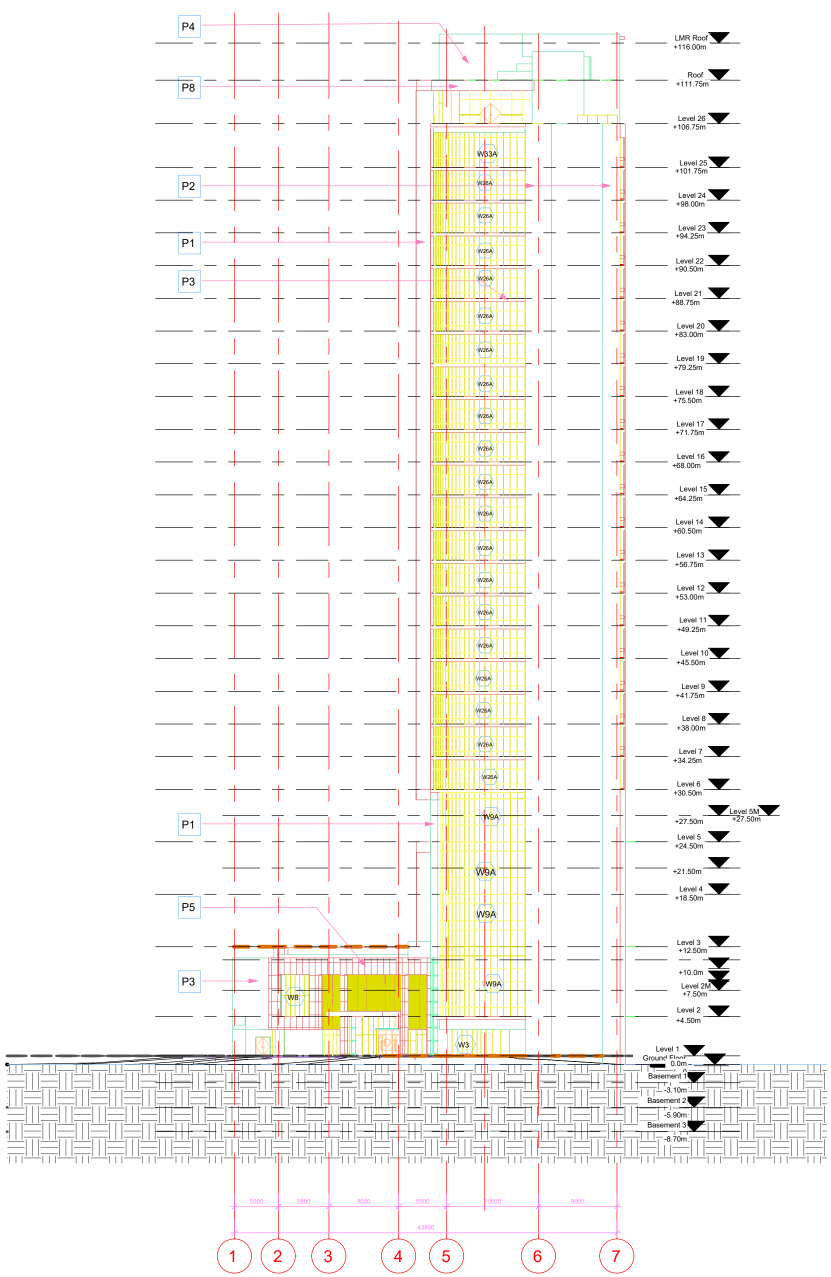
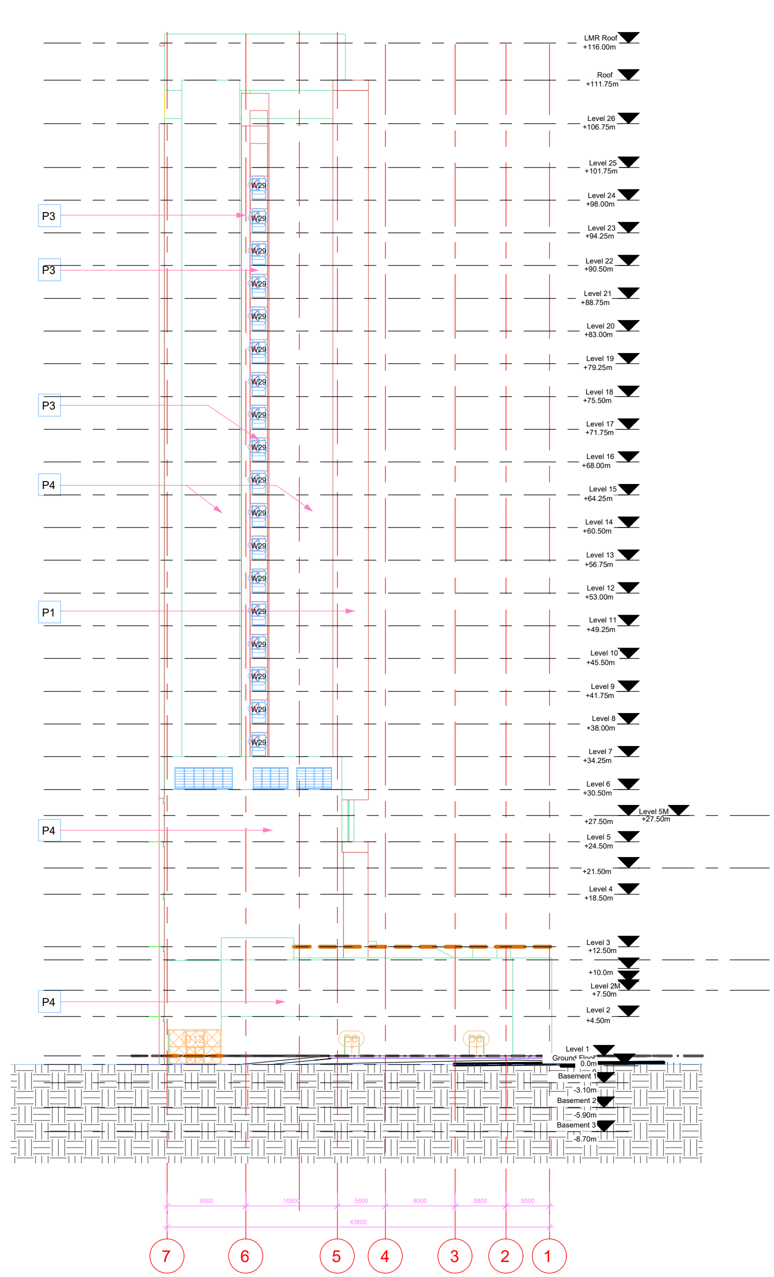
PROJECT: A FIVE STAR HOTEL

TITLE : WINDOW DETAIL

DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	





Deltadesh Pvt. Ltd.
Dhaka

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BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

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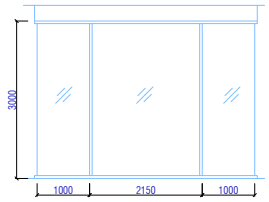
PROJECT: A FIVE STAR HOTEL

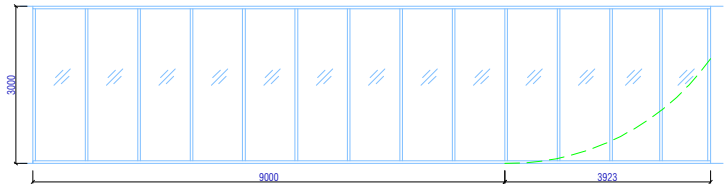
TITLE : WINDOW DETAIL

DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	

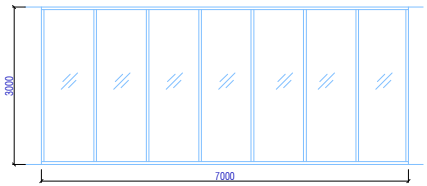
WINDOW DETAIL



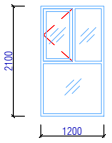
W1	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



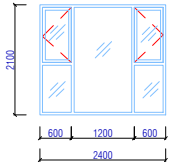
W3	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



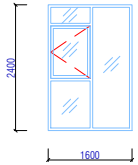
W4	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



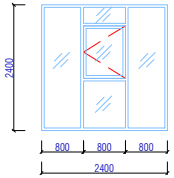
W5	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	Aluminium Handle
Hinge	Adjustable Side Hung Hinge
Lock	Lock set
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



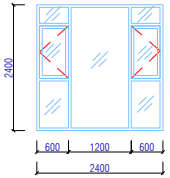
W6	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	Aluminium Handle
Hinge	Adjustable Side Hung Hinge
Lock	Lock set
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



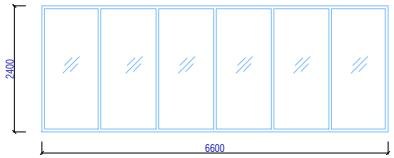
W13	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	Aluminium Handle
Hinge	Adjustable Side Hung Hinge
Lock	Lock set
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



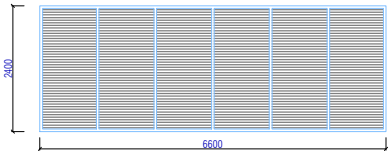
W14	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	Aluminium Handle
Hinge	Adjustable Side Hung Hinge
Lock	Lock set
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



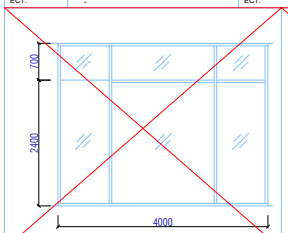
W15	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	Aluminium Handle
Hinge	Adjustable Side Hung Hinge
Lock	Lock set
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



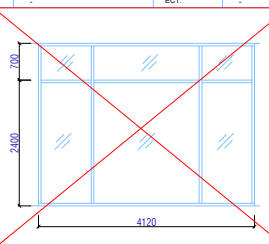
W16	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



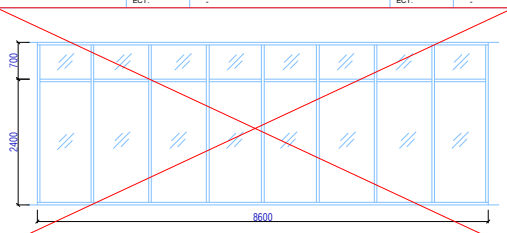
W17	
Frame	Aluminium Frame
Door / Window	Aluminium Louver
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



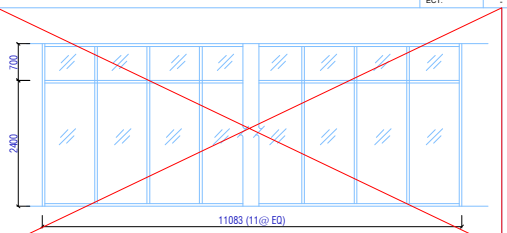
W23	W23=Open on left W23'=Open on right See Elevation1 (A-201)
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	Aluminium Handle
Hinge	Adjustable Side Hung Hinge
Lock	Lock set
Door Closer	-
Fitting	-
Bolt	-
ECT.	Concealed Locking



W24	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



W25	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



W26	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
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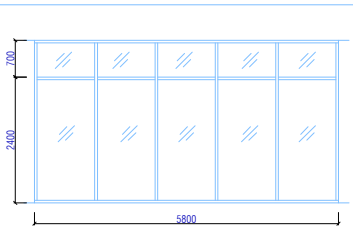
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



W27	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-

Deltadesh Pvt. Ltd. Dhaka

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
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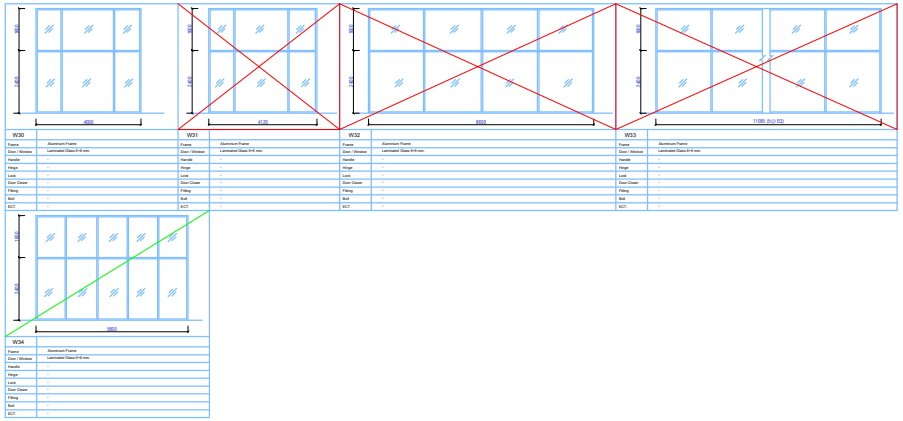
PROJECT:
A FIVE STAR HOTEL
TITLE :
WINDOW DETAIL

DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	



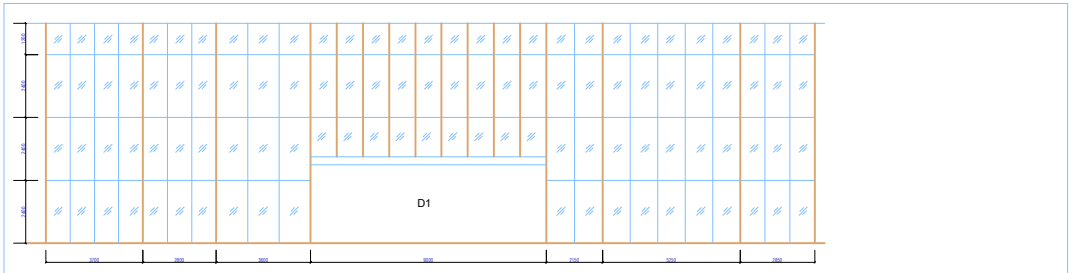
W30	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-

W31	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-

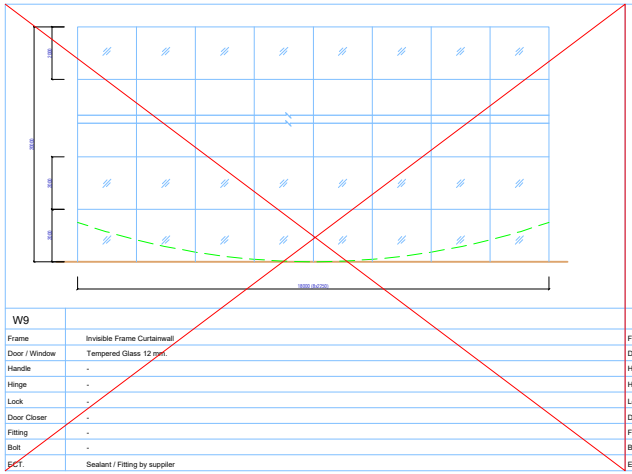
W32	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-

W33	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-

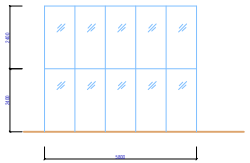
W34	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



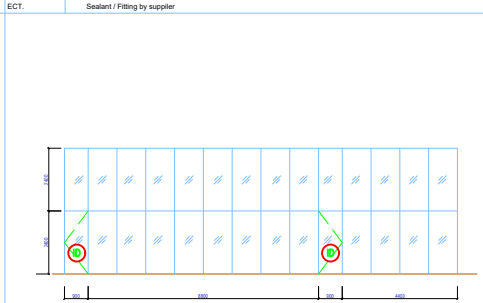
W2	
Frame	Invisible Frame Curtainwall
Door / Window	Tempered Glass 12 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	Sealant / Fitting by supplier



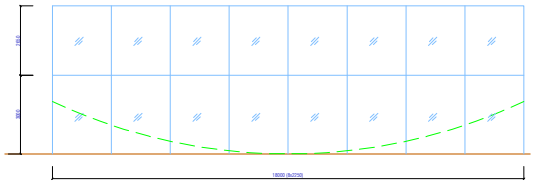
W9	
Frame	Invisible Frame Curtainwall
Door / Window	Tempered Glass 12 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	Sealant / Fitting by supplier



W10	
Frame	Invisible Frame Curtainwall
Door / Window	Tempered Glass 12 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	Sealant / Fitting by supplier



W18	
Frame	Invisible Frame Curtainwall
Door / Window	Tempered Glass 12 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	Sealant / Fitting by supplier



W19	
Frame	Invisible Frame Curtainwall
Door / Window	Tempered Glass 12 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	Sealant / Fitting by supplier

Deltadesign Pvt. Ltd. Dhaka

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GOSHALT AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

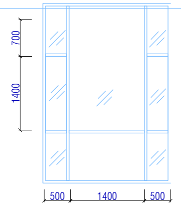
DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
281 SOI PRIDI BHANOMYONG 42, SUKHUMVIT 71 ROAD
VADHANA, BANGKOK, 10110 THAILAND.
PHONE: (66-2) 713-3888, FAX: (66-2) 713-3889
E-mail : dynamic4@dec.th.com

4WALLS inside outside
HOUSE NO. 264, ROAD NO. 19, NEW DOHS,
MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
Ph: +8801711433431, +8801710912353

PROJECT:
A FIVE STAR HOTEL
TITLE :
WINDOW DETAIL

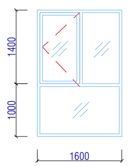
DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	

WINDOW DETAIL



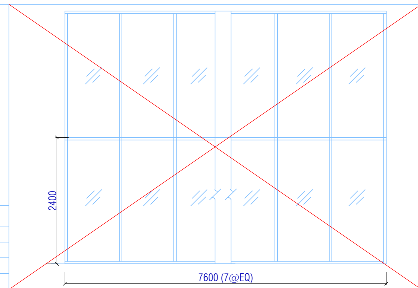
W28

Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	Aluminium Handle
Hinge	Adjustable Side Hung Hinge
Lock	Lock set
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



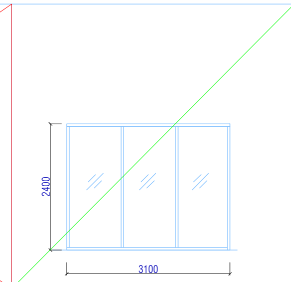
W29

Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	Aluminium Handle
Hinge	Adjustable Side Hung Hinge
Lock	Lock set
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



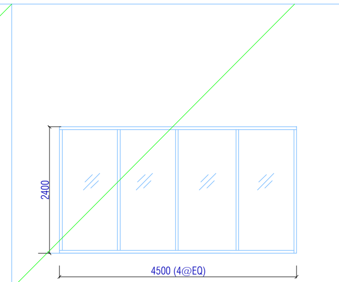
W35

Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



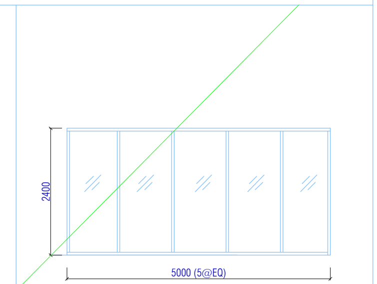
W36

Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



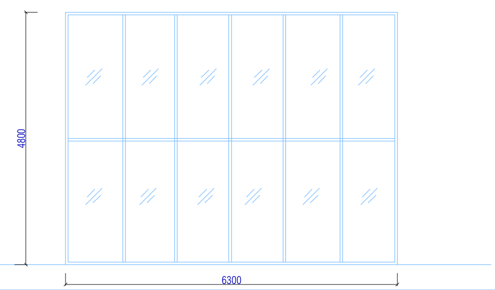
W37

Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



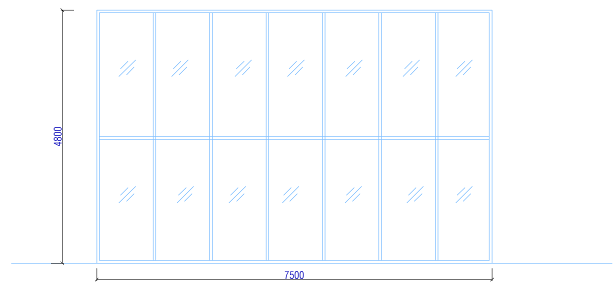
W38

Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



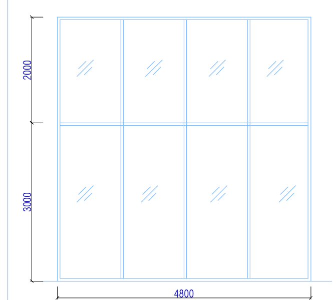
W7

Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



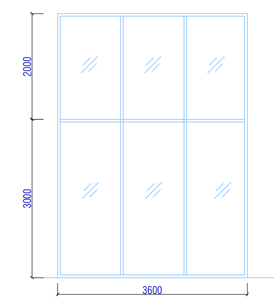
W8

Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



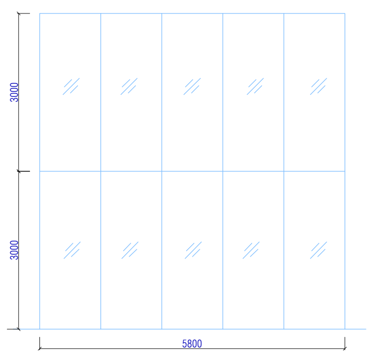
W11

Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



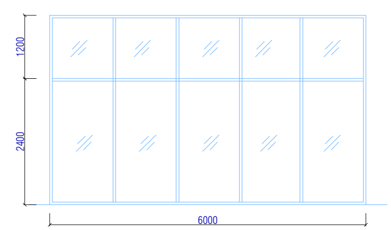
W12

Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



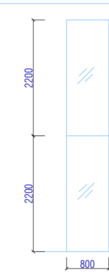
W20

Frame	-
Door / Window	Tempered Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	Sealant / Fitting by supplier



W21

Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-



Deltadesh Pvt. Ltd Dhaka

W22

Frame	Aluminium Frame
Door / Window	Tempered Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	Sealant / Fitting by supplier

C:\SWISSOTEL\20230725_SWISSOTEL\4WALLS_PLAN\Final Logo.jpg

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
281 SOI PRIDI BHANOMYONG 42, SUKHUMVIT 71 ROAD
VADHANA, BANGKOK, 10110 THAILAND.
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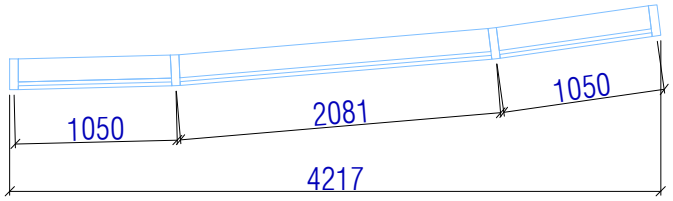
4WALLS inside outside
HOUSE NO. 264, ROAD NO. 19, NEW DOHS, MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
Ph: +8801711433431, +8801710912353

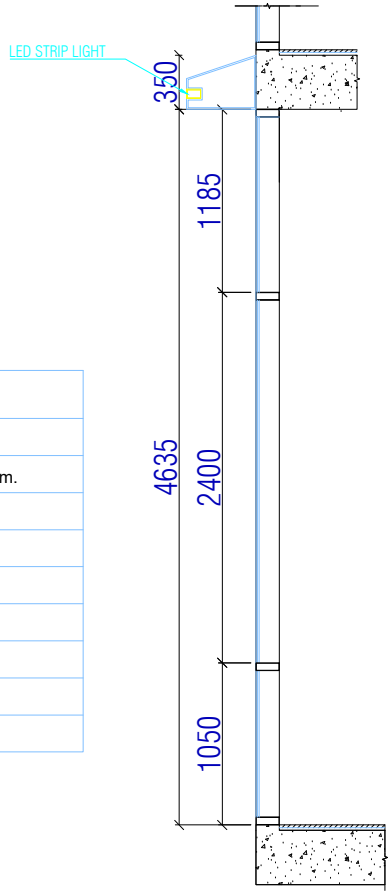
PROJECT: A FIVE STAR HOTEL

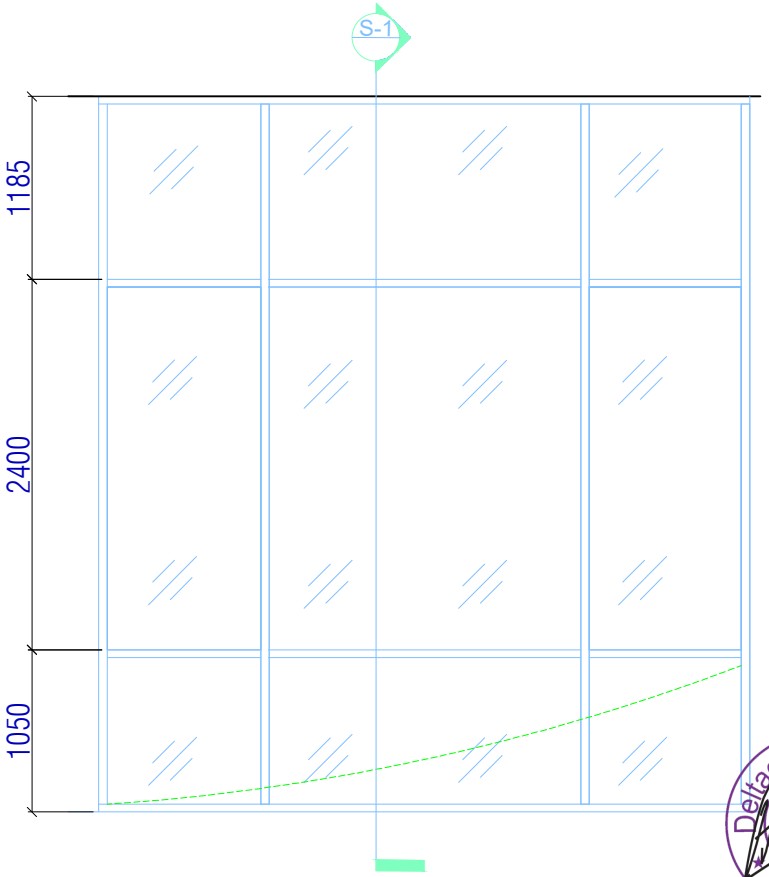
TITLE : WINDOW DETAIL

DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	



PLAN





W 31A	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	

W31A Windows

SECTION: S1-S1

ELEVATION

Deltadesh Pvt. Ltd. Dhaka

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

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4WALLS inside outside
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PROJECT:
A FIVE STAR HOTEL
TITLE :
WINDOW DETAIL

DRAWN BY :	CHECKED BY :
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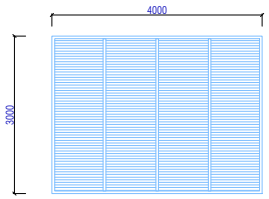
DATE :	SCALE :
PROJECT NO.	
DWG.NO	

WINDOW DETAIL



W39	
Frame	Aluminium Frame
Door / Window	Aluminium Louver
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	-

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PROJECT:
A FIVE STAR HOTEL

TITLE :
WINDOW DETAIL

DRAWN BY :	CHECKED BY :
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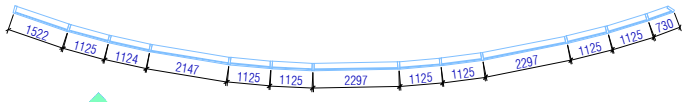
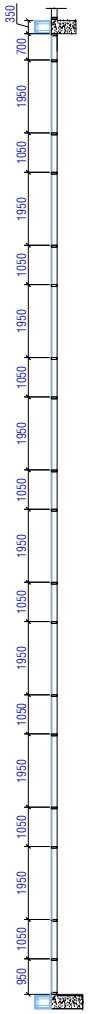
DATE :	SCALE :

PROJECT NO.
DWG.NO

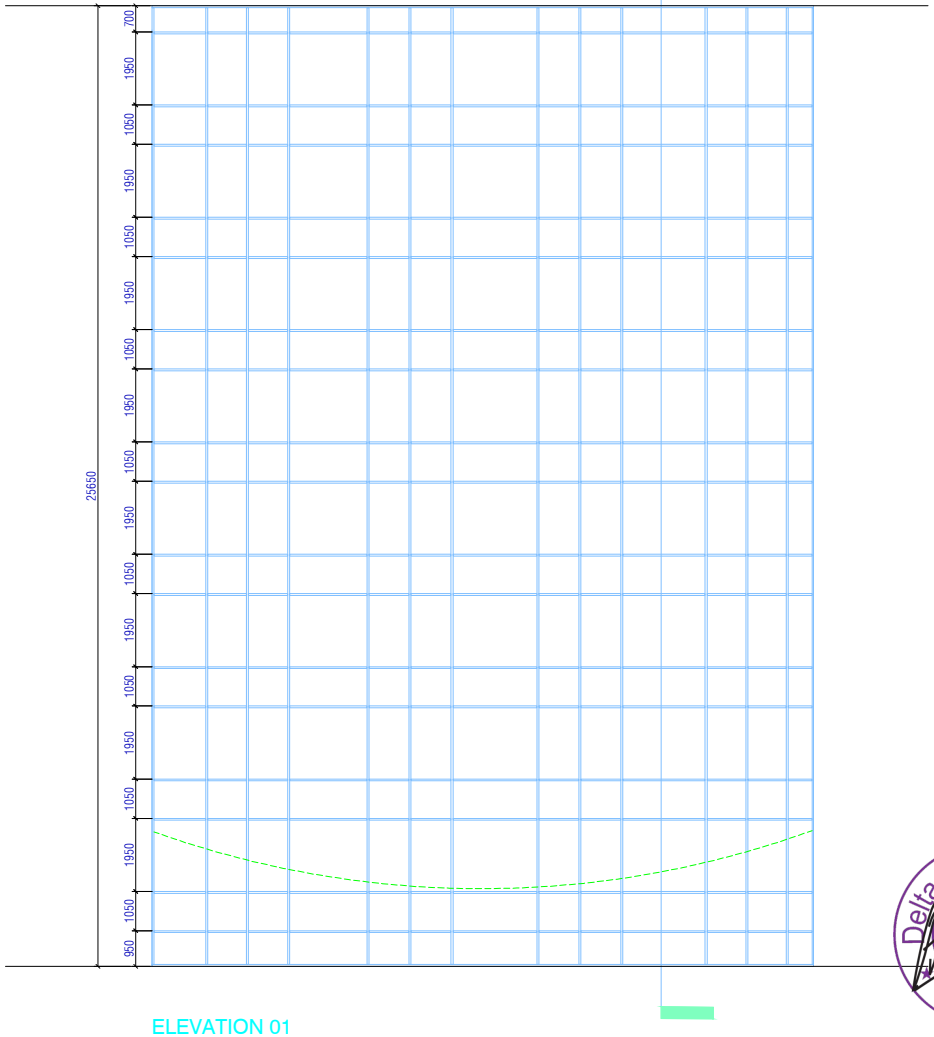


PLAN

S-1



SECTION: S1-S1



ELEVATION 01

W9A	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	

W9A Windows

Deltadesh Pvt. Ltd. Dhaka

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

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VADHANA, BANGKOK, 10110 THAILAND.
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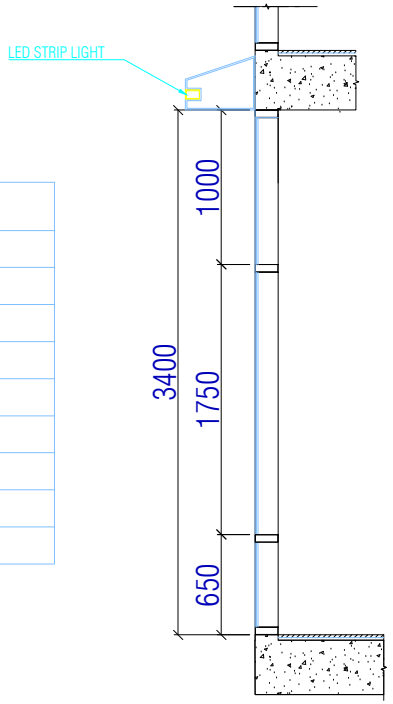
4WALLS inside outside
HOUSE NO. 264, ROAD NO. 19, NEW DOHS,
MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
Ph: +8801711433431, +8801710912353

PROJECT:
A FIVE STAR HOTEL
TITLE :
WINDOW DETAIL

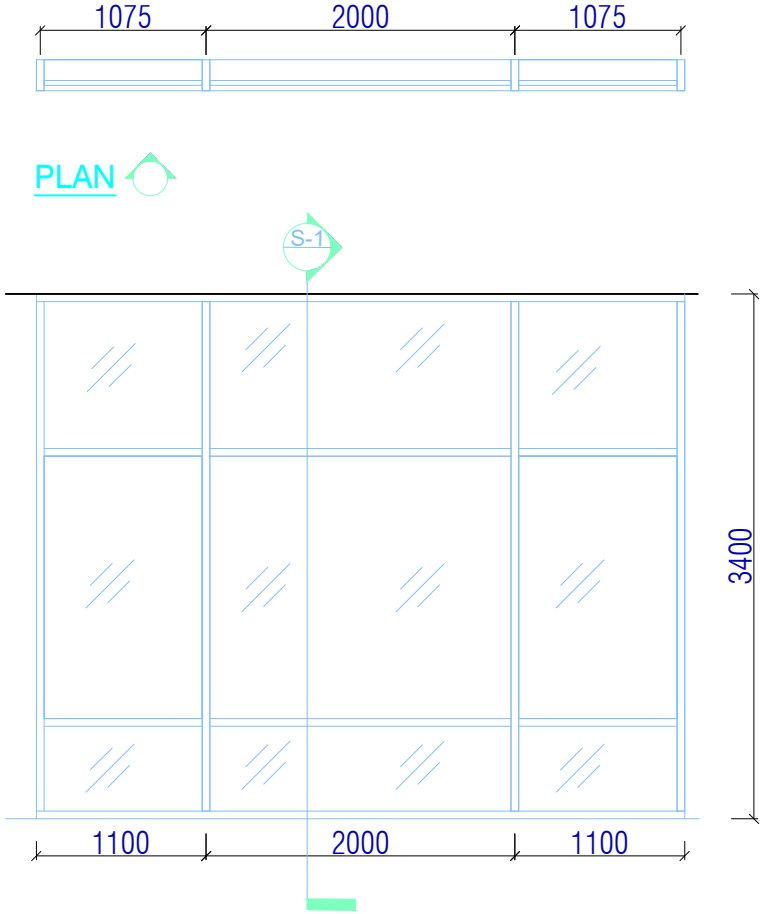
DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	

W23A	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	

W23A Windows



SECTION: S1-S1



ELEVATION

Deltadesh Pvt. Ltd. Dhaka

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

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PROJECT:
A FIVE STAR HOTEL
TITLE :
WINDOW DETAIL

DRAWN BY :	CHECKED BY :
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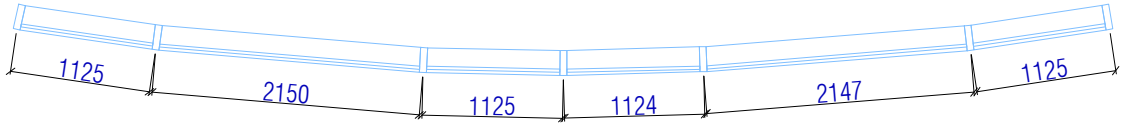
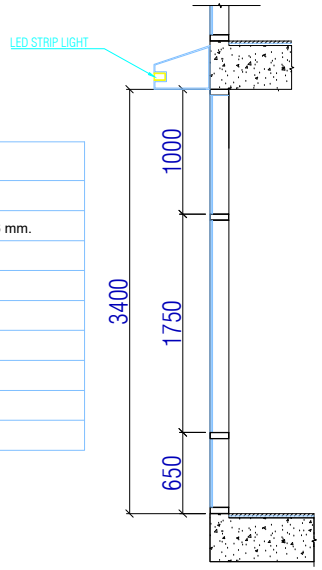
DWG.NO	



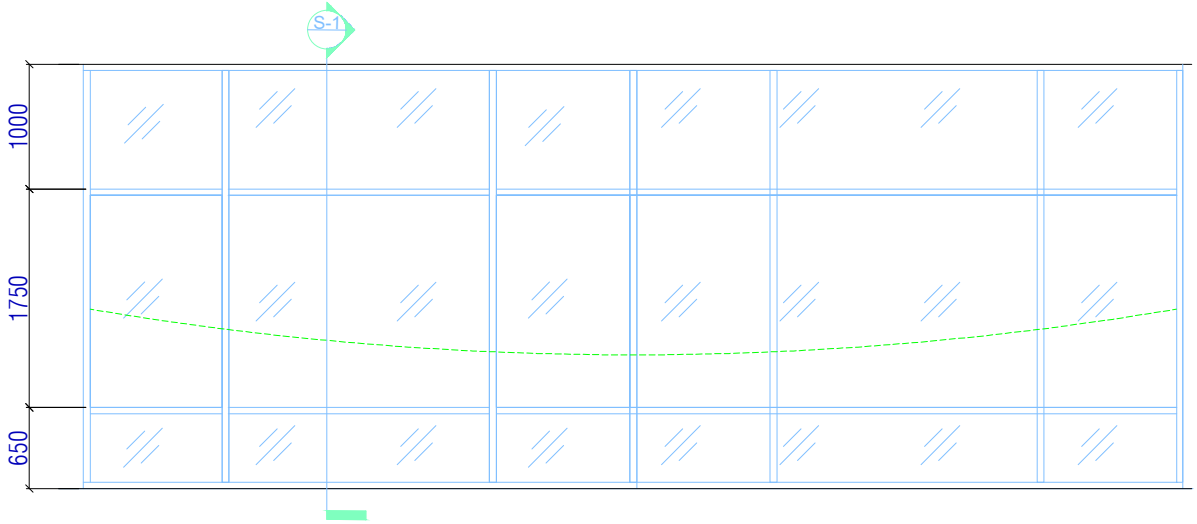
PLAN

W25A	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	

W25A Windows



SECTION: S1-S1



ELEVATION

Deltadesh Pvt. Ltd. Dhaka

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GOSHALA AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

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281 SOI PRIDI BHANOMYONG 42, SUKHUMVIT 71 ROAD
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WALLS inside outside
HOUSE NO. 264, ROAD NO. 19, NEW DOHS,
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A FIVE STAR HOTEL
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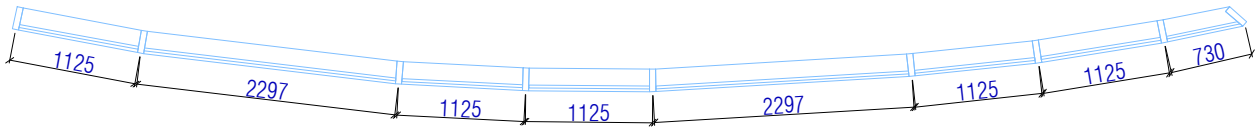
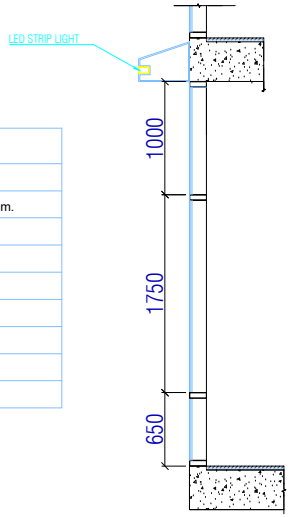
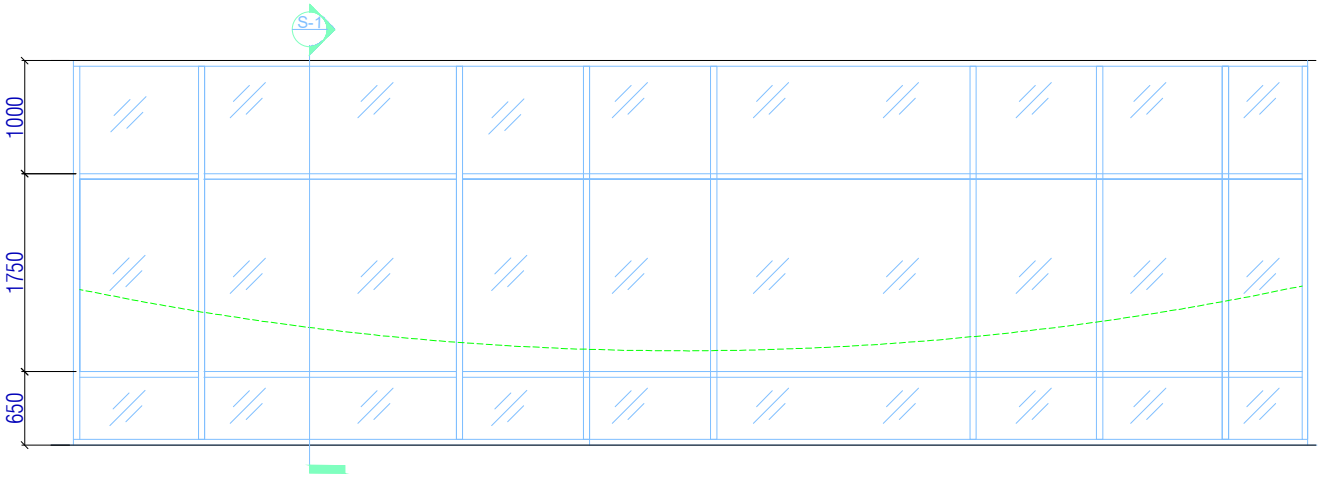


PLAN





W26A	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	

W26A Windows

Deltadesh Pvt. Ltd. Dhaka

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
281 SOI PRIDI BHANOMYONG 42, SUKHUMVIT 71 ROAD
VADHANA, BANGKOK, 10110 THAILAND.
PHONE: (66-2) 713-3888, FAX: (66-2) 713-3889
E-mail : dynamic4@dec.th.com

4WALLS inside outside
HOUSE NO. 264, ROAD NO. 19, NEW DOHS,
MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
Ph: +8801711433431, +8801710912353

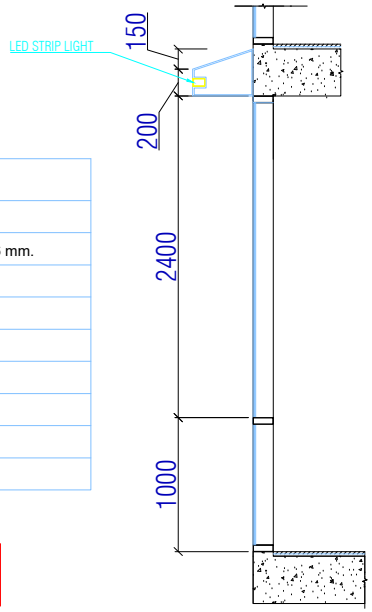
PROJECT:
A FIVE STAR HOTEL
TITLE :
WINDOW DETAIL

DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :

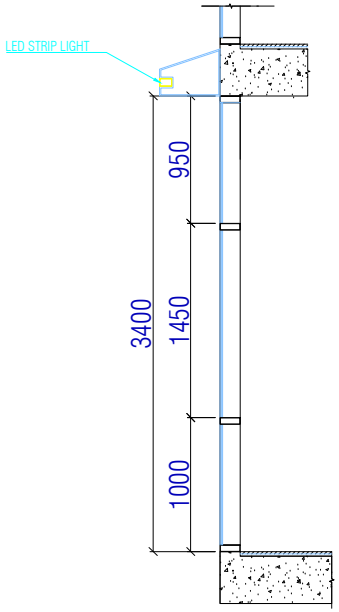
PROJECT NO.
DWG.NO

W28A	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	

W28A Windows



SECTION: S1-S1



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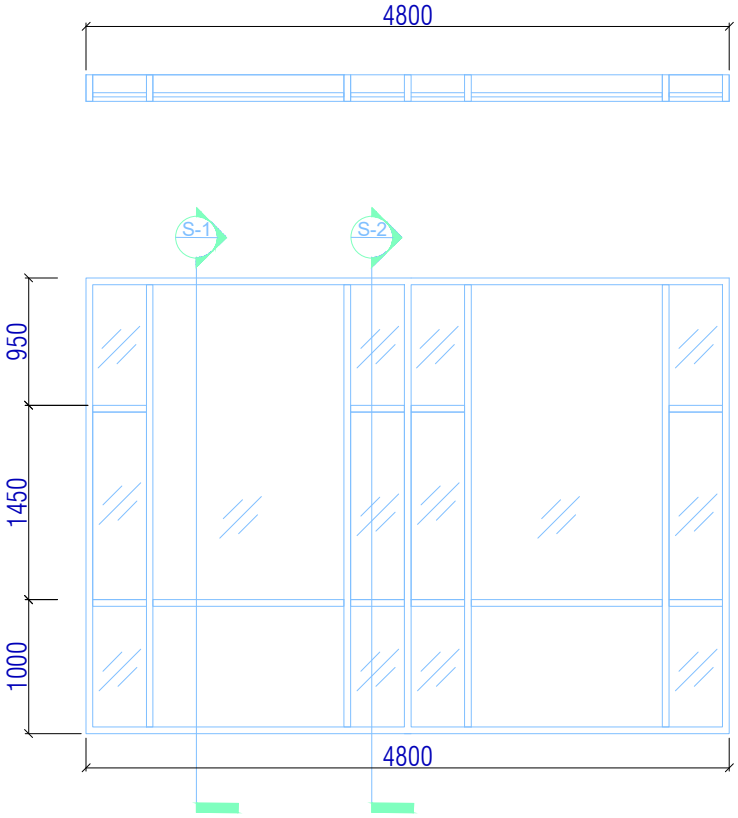

Deltadesh Pvt. Ltd. Dhaka

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
281 SOI PRIDI BHANOMYONG 42, SUKHUMVIT 71 ROAD
VADHANA, BANGKOK, 10110 THAILAND.
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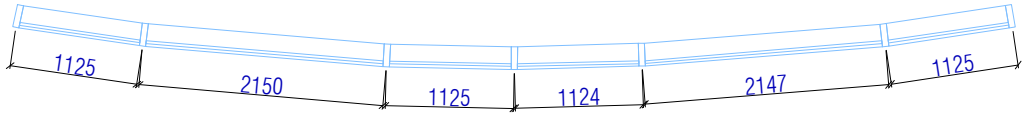
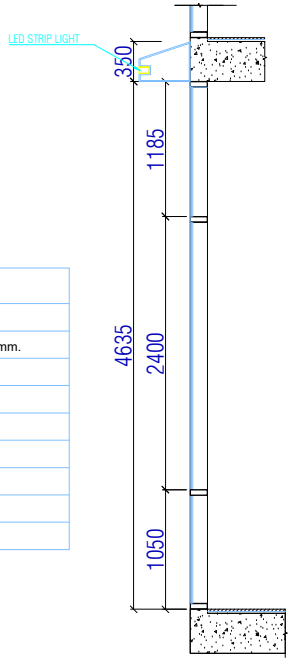
HOUSE NO. 264, ROAD NO. 19, NEW DOHS,
MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
Ph: +8801711433431, +8801710912353

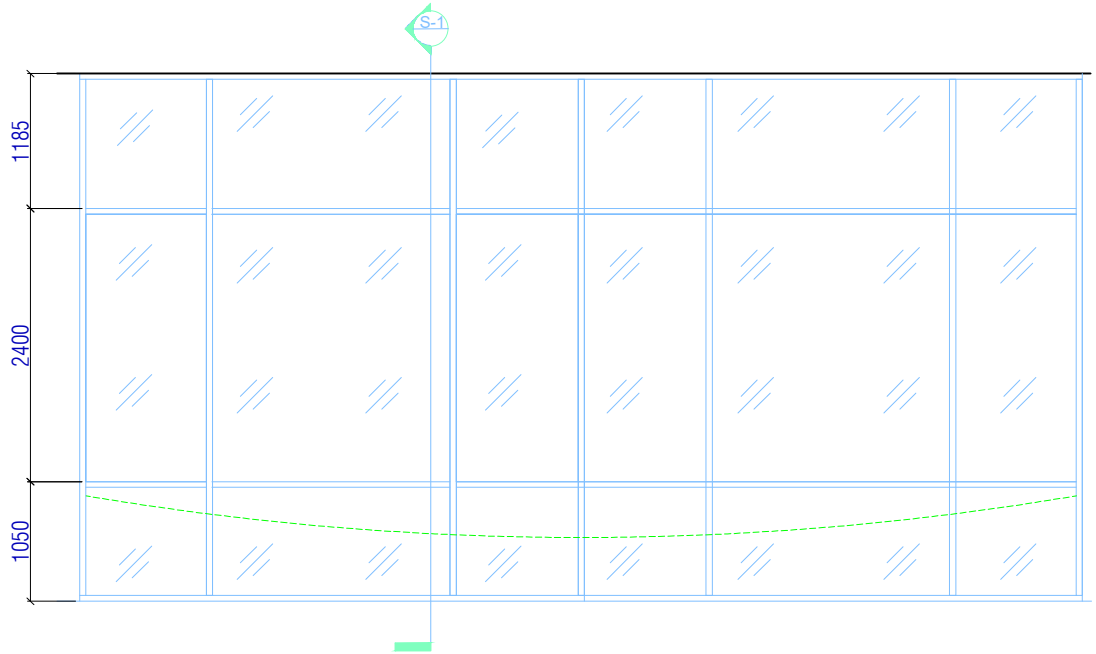
PROJECT:
A FIVE STAR HOTEL
TITLE :
WINDOW DETAIL

DRAWN BY :
CHECKED BY :
DESIGN BY :
PROJECT MGR. :
DATE :
SCALE :
PROJECT NO.
DWG.NO



PLAN





W32A	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	

W32A Windows

SECTION: S1-S1

ELEVATION

Deltadesh Pvt. Ltd. Dhaka

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

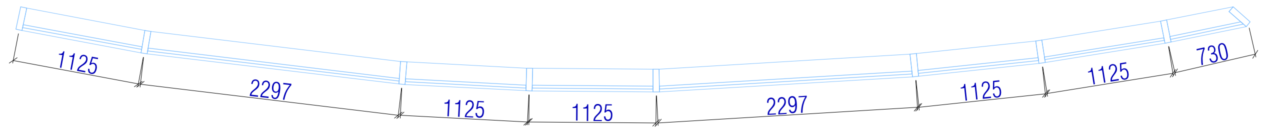
DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
281 SOI PRIDI BHANOMYONG 42, SUKHUMVIT 71 ROAD
VADHANA, BANGKOK, 10110 THAILAND.
PHONE: (66-2) 713-3888, FAX: (66-2) 713-3889
E-mail : dynamic4@dec.th.com

4WALLS limited outside
HOUSE NO. 264, ROAD NO. 19, NEW DOHS,
MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
Ph: +8801711433431, +8801710912353

PROJECT:
A FIVE STAR HOTEL

TITLE :
WINDOW DETAIL

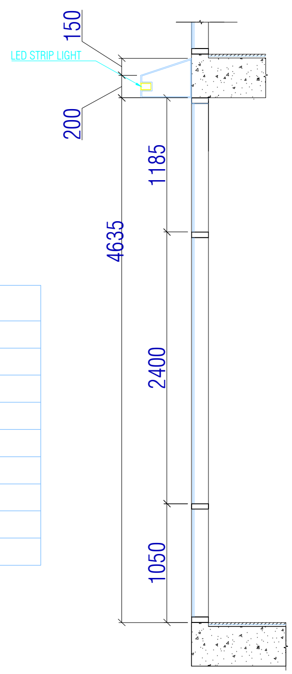
DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	



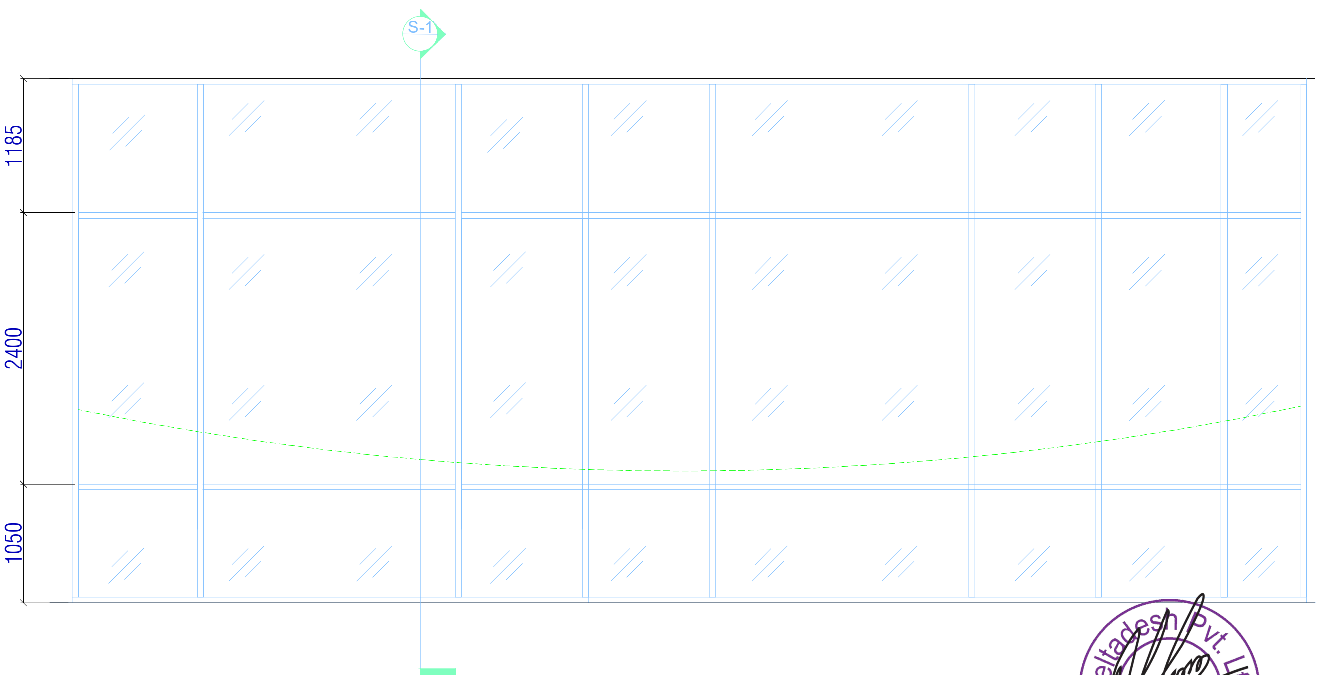
PLAN

W33A	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	

W33A Windows



SECTION: S1-S1



ELEVATION

E:\SWISSOTEL\20230725_SWISSOTEL\4WALLS_PLAN\Final Logo.jpg

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
281 SOI PRIDI BHANOMYONG 42, SUKHUMVIT 71 ROAD
VADHANA, BANGKOK, 10110 THAILAND.
PHONE: (66-2) 713-3888, FAX: (66-2) 713-3889
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4WALLS inside outside
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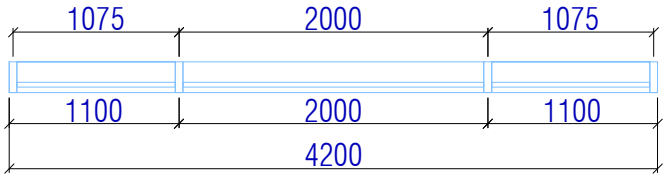
MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
Ph: +8801711433431, +8801710912353

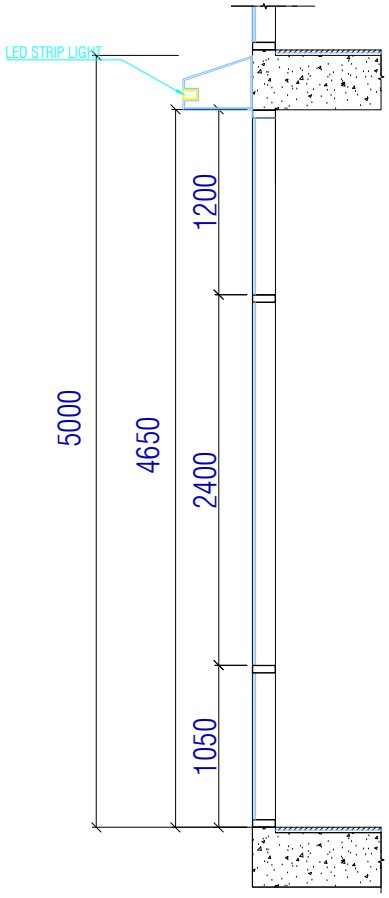
PROJECT: A FIVE STAR HOTEL

TITLE : WINDOW DETAIL

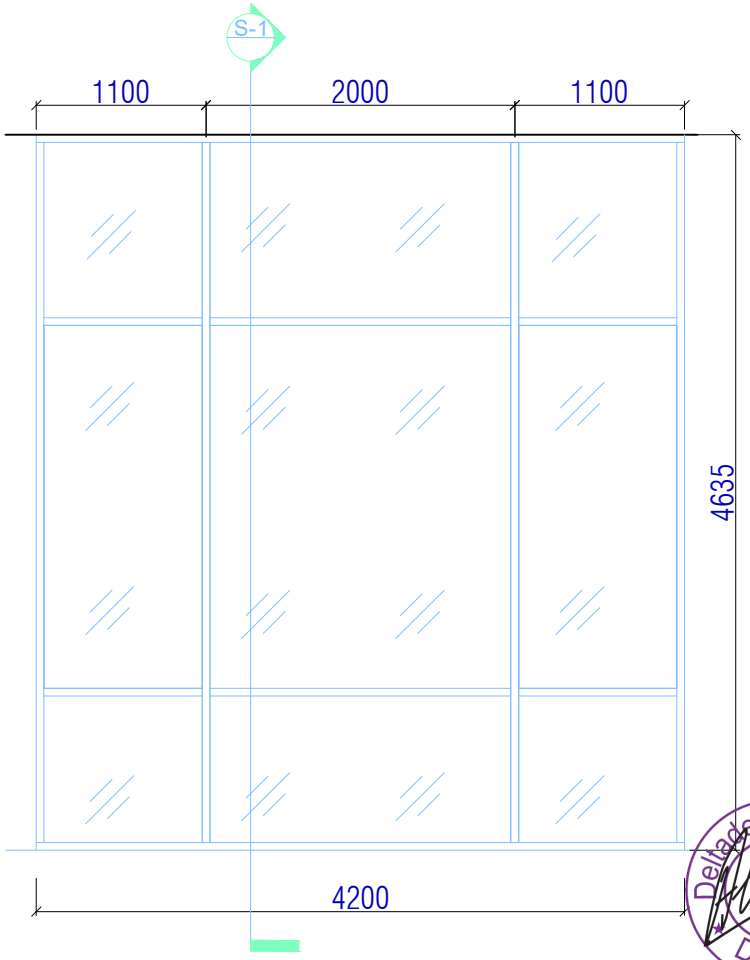
DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	



PLAN



SECTION: S1-S1



ELEVATION

W35A	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	

W35A Windows

Delgadesh Pvt. Ltd. Dhaka

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

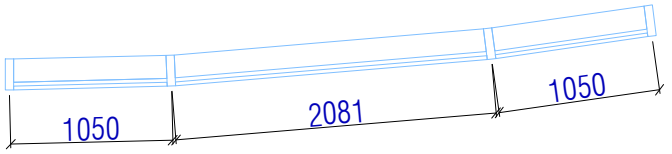
REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
281 SOI PRIDI BHANOMYONG 42, SUKHUMVIT 71 ROAD
VADHANA, BANGKOK, 10110 THAILAND.
PHONE: (66-2) 713-3888, FAX: (66-2) 713-3889
E-mail : dynamic4@dec.th.com

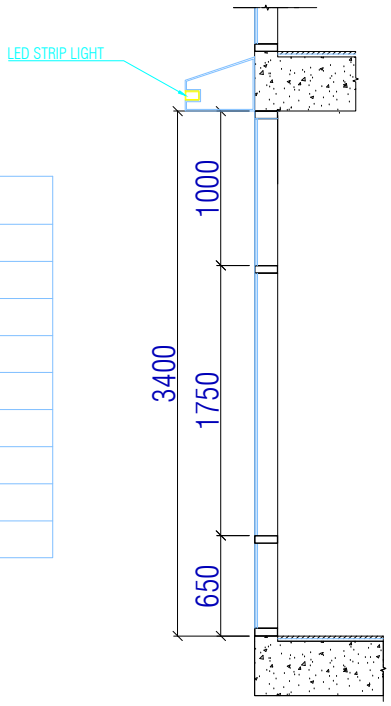
4WALLS inside outside
HOUSE NO. 264, ROAD NO. 19, NEW DOHS,
MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
Ph: +8801711433431, +8801710912353

PROJECT:
A FIVE STAR HOTEL
TITLE :
WINDOW DETAIL

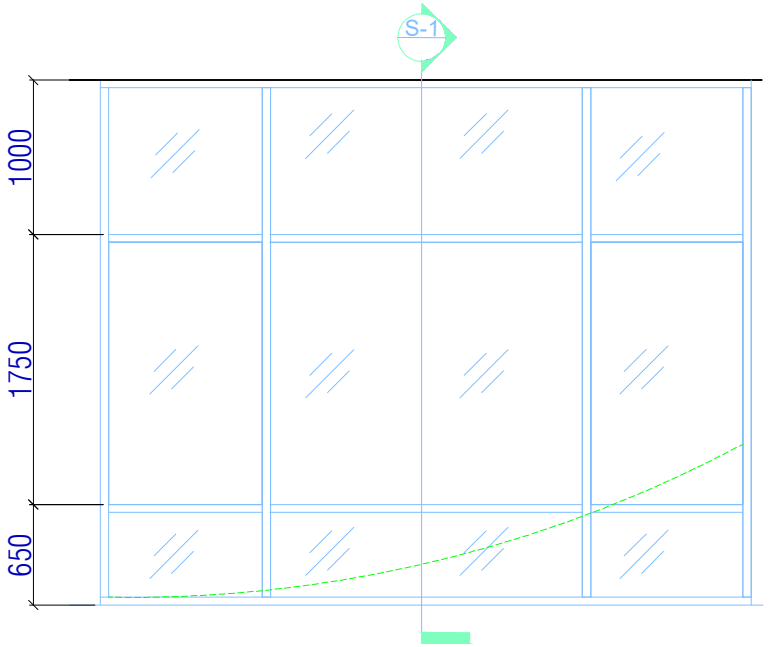
DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	



PLAN



SECTION: S1-S1



ELEVATION

W24A	
Frame	Aluminium Frame
Door / Window	Laminated Glass 6+6 mm.
Handle	-
Hinge	-
Lock	-
Door Closer	-
Fitting	-
Bolt	-
ECT.	

W24A Windows

Deltadesh Pvt. Ltd. Dhaka

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GOSHAIT AVENUE
DHAKA 1212 BANGLADESH

THIS DRAWING IS CONFIDENTIAL AND IS THE EXCLUSIVE PROPERTY OF BENGAL CONCEPT & HOLDINGS LIMITED FOR SWISSOTEL AND RAFFLES PROJECTS SUBJECT TO THE CONDITION THAT IT IS NOT TO BE REPRODUCED OR USED TO FURNISH INFORMATION FOR THE MAKING OR PRINTS EXCEPT AS SANCTIONED IN WRITING BY BENGAL CONCEPT AND HOLDINGS LIMITED.

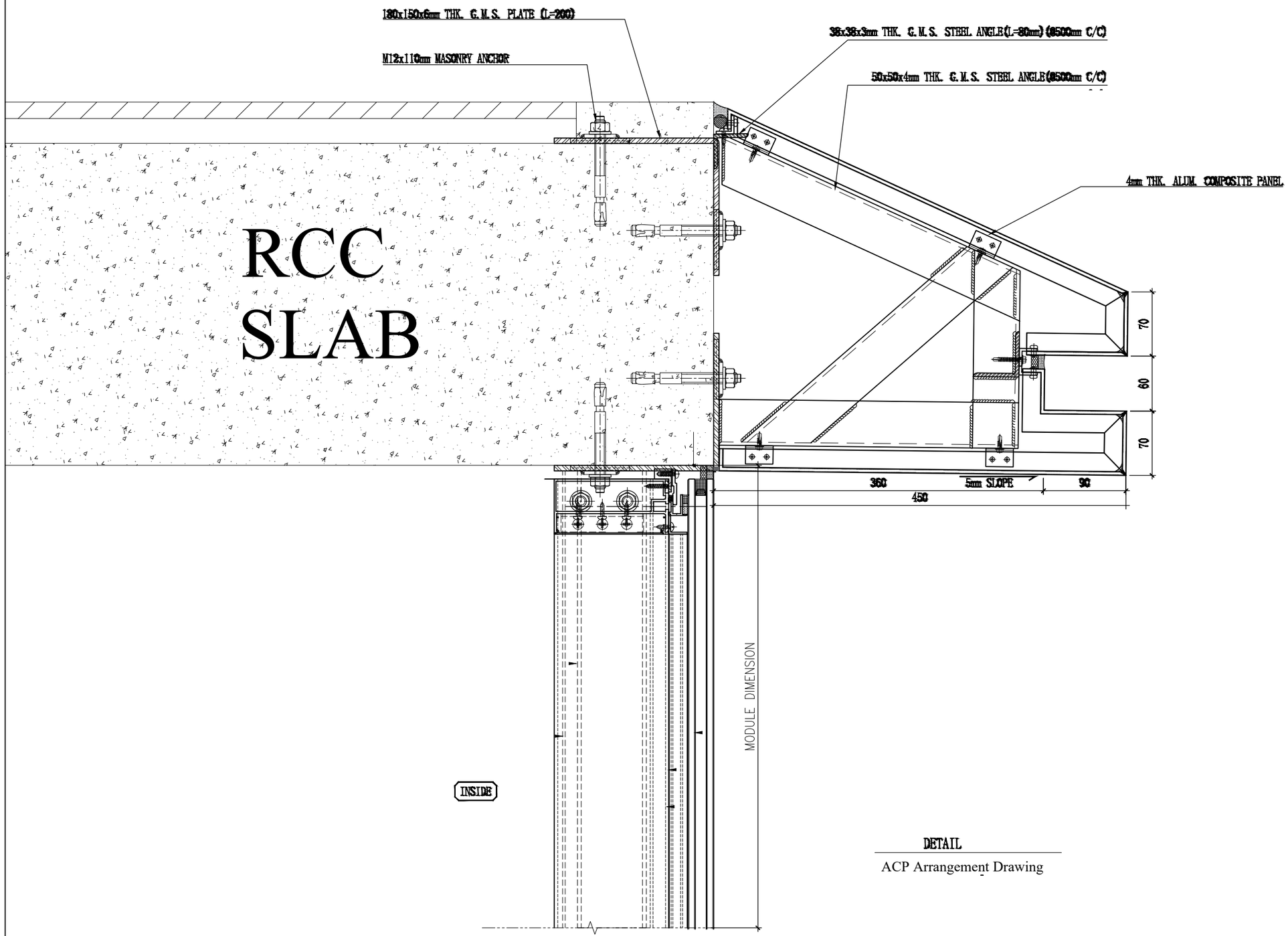
REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY

DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
281 SOI PRIDI BHANOMYONG 42, SUKHUMVIT 71 ROAD
VADHANA, BANGKOK, 10110 THAILAND.
PHONE: (66-2) 713-3888, FAX: (66-2) 713-3889
E-mail : dynamic4@dec.th.com

4WALLS inside outside
HOUSE NO. 264, ROAD NO. 19, NEW DOHS,
MOHAKHALI, DHAKA-1206, BANGLADESH. www.4wallsbd.com
Ph: +8801711433431, +8801710912353

PROJECT:
A FIVE STAR HOTEL
TITLE :
WINDOW DETAIL

DRAWN BY :	CHECKED BY :
DESIGN BY :	PROJECT MGR. :
DATE :	SCALE :
PROJECT NO.	
DWG.NO	



DETAIL

ACP Arrangement Drawing

KEY PLAN :

Remarks

Construction Design

Client: BHRL

Curtain Wall Design

Curtain Wall Construction

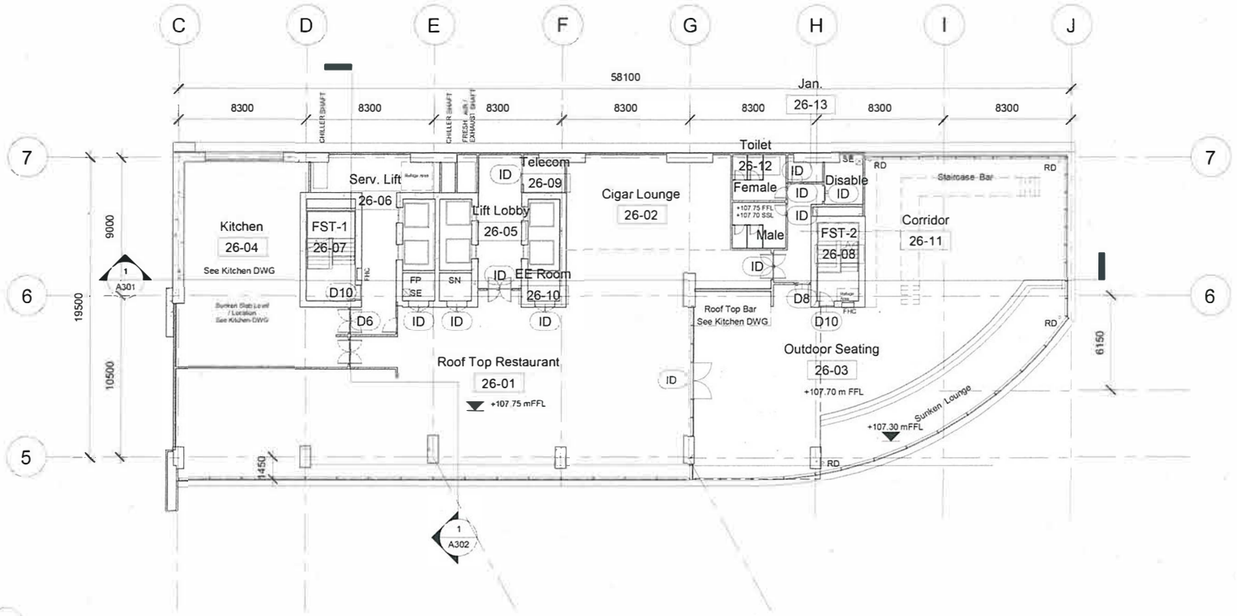
Project Name
Swissotel, Dhaka

Project No.		
Drawn		
Designed		
Structure Designed		
Checked		
Charge		
Verified		
Approved		

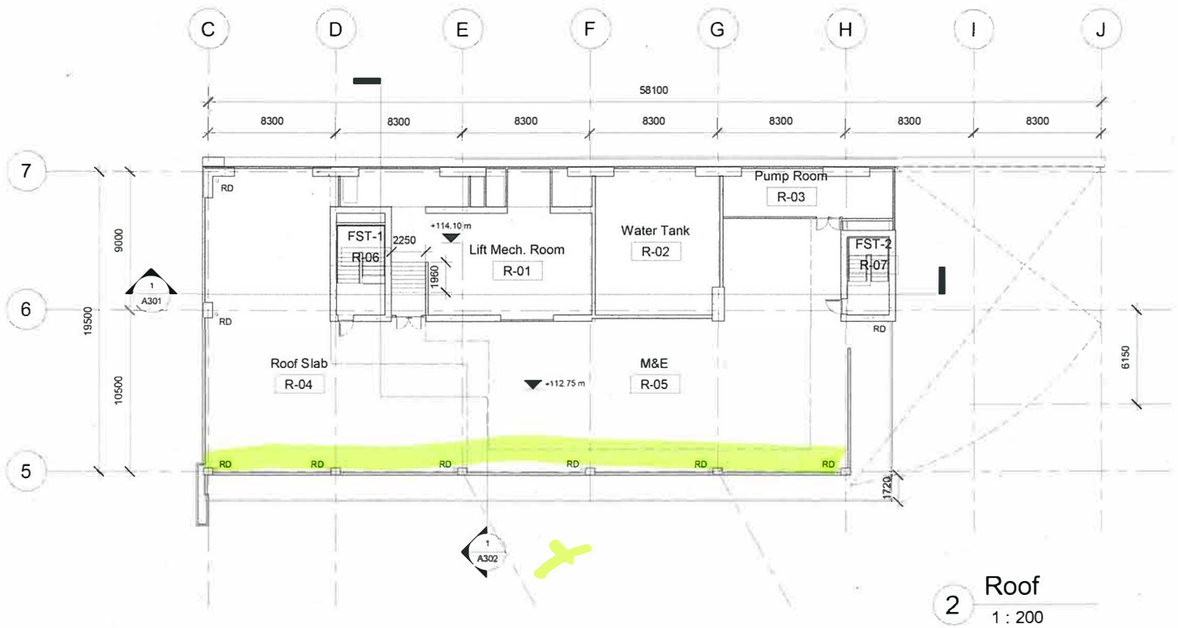
Drawing Title

DETAIL

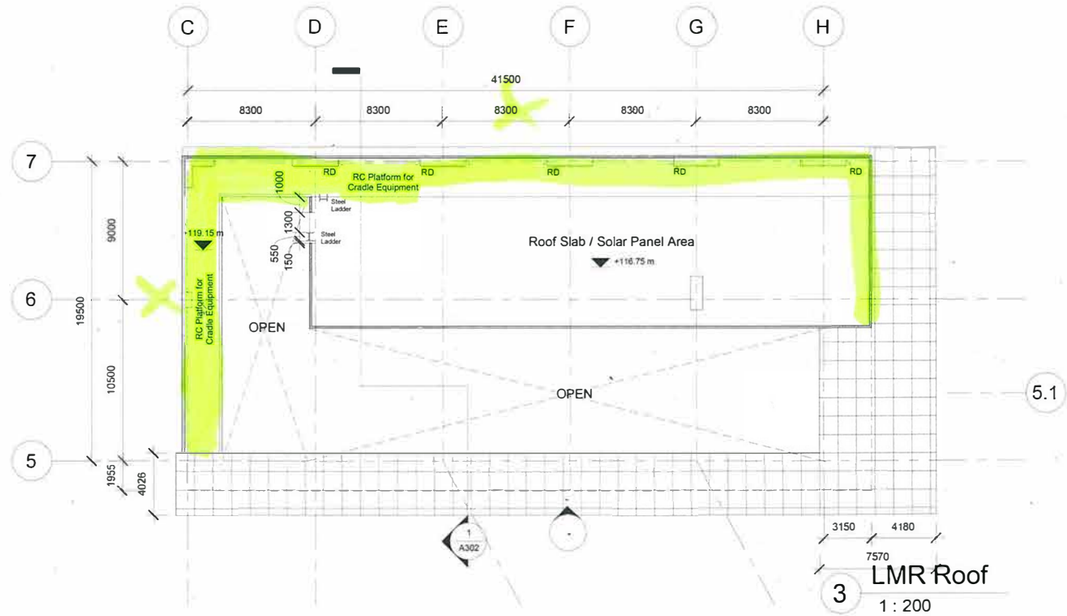
Deltadesh Pvt. Ltd. Dhaka



1 Level 26
1 : 200



2 Roof
1 : 200



3 LMR Roof
1 : 200

Deltadesh Pvt. Ltd. Dhaka

BENGAL hotels & resorts

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY	REV. NO.	DATE	DESCRIPTION	BY
-	12/03	Final Arch. Design DWG 2019/12/03		09/02		3rd Final Arch. Design DWG 2021/09/02	
	06/23	2nd Final Arch. Design DWG 2020/06/23					
	03/05	2nd Final Arch. Design DWG 2021/03/05					
		PMC comment					

DYNAMIC ENGINEERING CONSULTANTS CO., LTD.
281 SOI PRIDI BHANOMYONG 42. SUKHUMVIT 71 ROAD
VADHANA, BANGKOK, 10110 THAILAND.
PHONE: (66-2) 713-3888, FAX: (66-2) 713-3889
E-mail : dynamic4@dec th.com

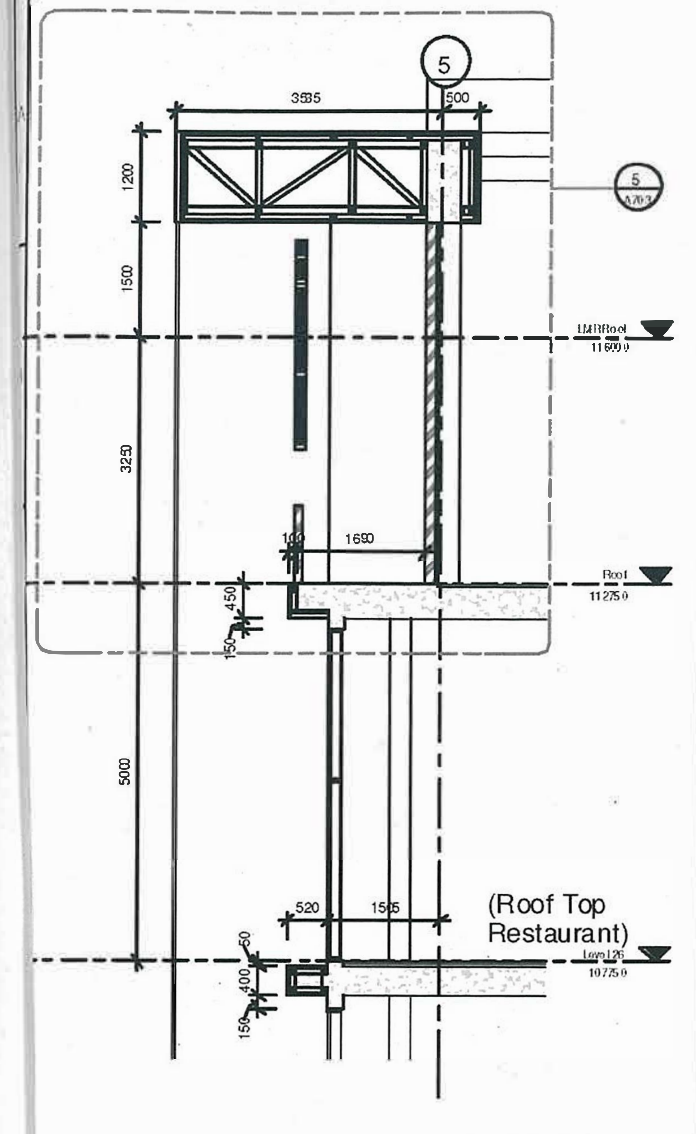
Architect & Planners
Interdesign International Co., Ltd.
The Portico Building
31 Langsuan Road, Lumpini, Bangkok, Thailand 10330
Tel : (66-2) 252-7790 FAX : (66-2) 252-8492
E-mail : interdes331@gmail.com

PROJECT
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

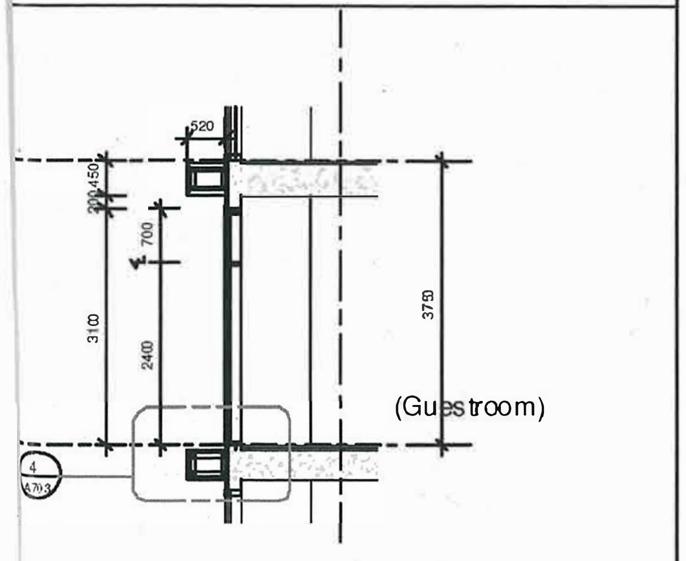
TITLE
LEVEL 26 -Roof Plan

DRAWN BY	IDL	CHECKED BY	IDL
DESIGN BY	Sathapanick S.	PROJECT MGR	Chanintorn
DATE	28/01/2022	SCALE	1 : 200
PROJECT NO.	113073		
DWG.NO	A110		

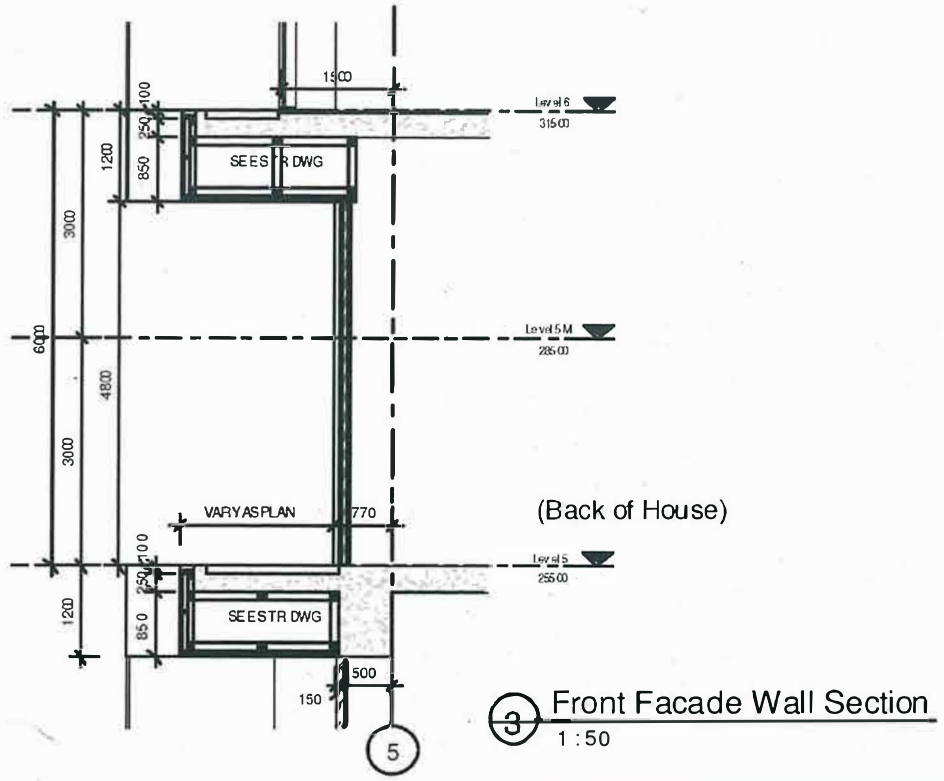
8/4/2023 3:43:59 PM



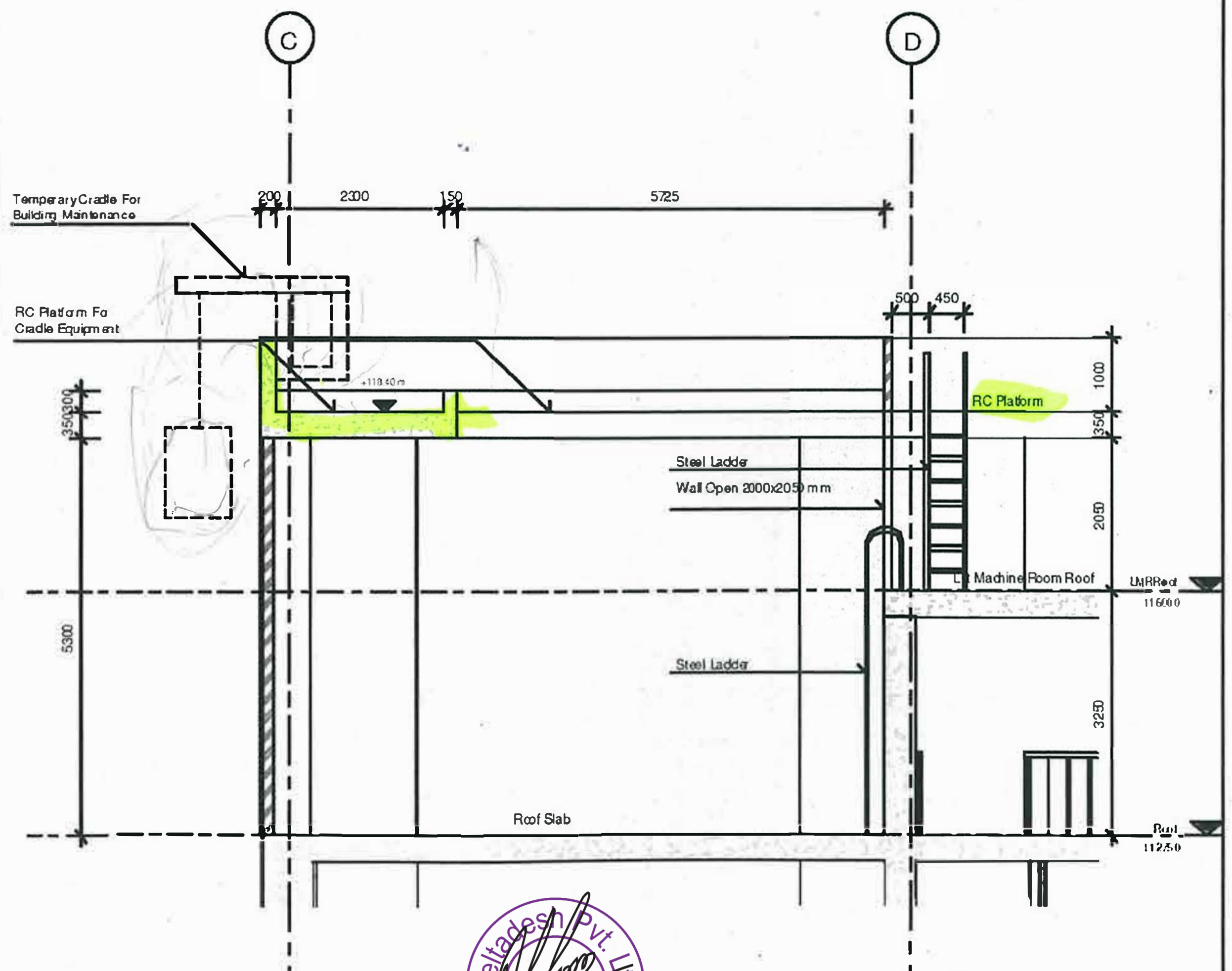
1 Front Facade Wall Section
1 : 50



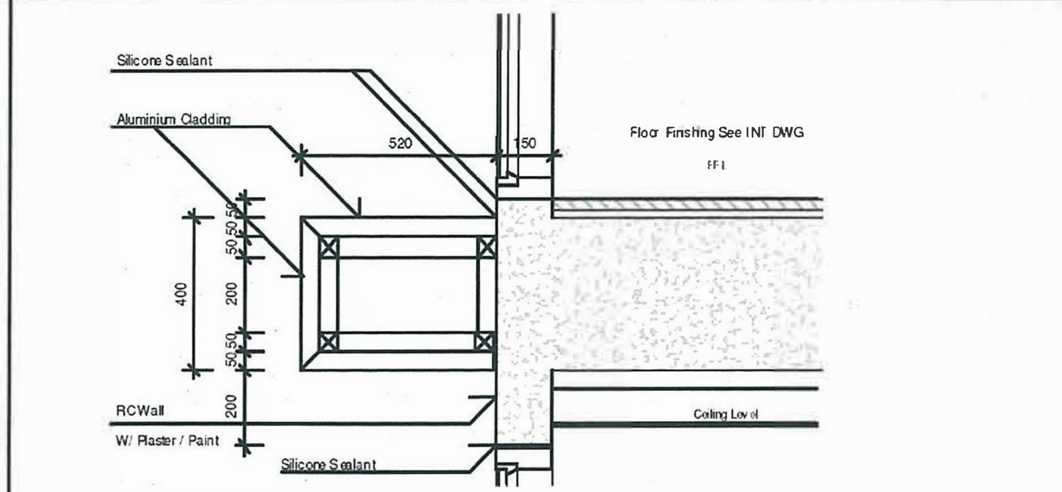
2 Front Facade Wall Section
1 : 50



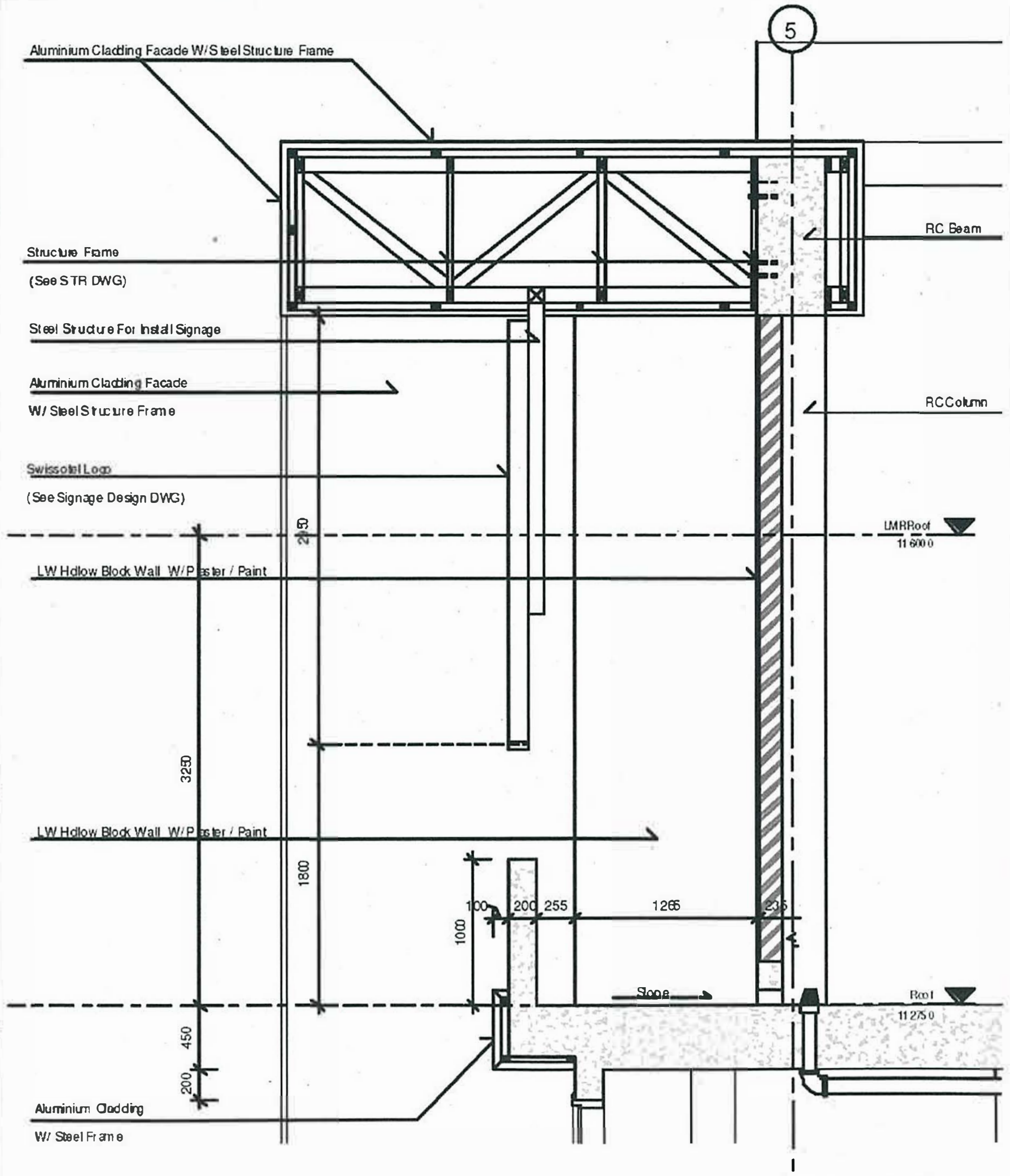
3 Front Facade Wall Section
1 : 50



6 Roof Top RC Platform
1 : 50



4 Guestroom Facade Detail
1 : 10



5 Detail-1
1 : 25

BENGAL hotels & resorts

BENGAL HOTELS & RESORTS LIMITED
BENGAL HOUSE 75 GULSHAN AVENUE
DHAKA 1212 BANGLADESH

REV. NO.	DATE	DESCRIPTION	BY
-	12.03	Final Arch. Design DWG 2019/12/03	
	06.23	2nd Final Arch. Design DWG 2020/06/23	
	03.05	2nd Final Arch. Design DWG 2021/03/05	
		PMC comment	

REV. NO.	DATE	DESCRIPTION	BY
	09.02	3rd Final Arch. Design DWG 2021/09/02	

DYNAMIC ENGINEERING CONSULTANTS CO., LTD.

Architect & Planners
Interdesign International Co., Ltd.

PROJECT:
BENGAL HOTELS AND RESORTS
A FIVE STAR HOTEL

TITLE
Guestroom Facade Wall Section

DRAWN BY:	IDL	CHECKED BY:	IDL
DESIGN BY:	Sathapanick S.	PROJECT MGR:	Chanintorn
DATE:	28.01/2022	SCALE:	As indicated
PROJECT NO.	11307.3		
DWG NO.	A703		

01/28/2022 10:53:53 AM

swissôtel

DHAKA BANGLADESH

FAÇADE DESIGN

Deltadesh Pvt. Ltd. Dhaka

CLIENT

BENGAL hotels & resorts

CONSULTANT:

DEC

LOCAL CONSULTANT:

4 WALLS inside outside


swissôtel
swissôtel
Deltades Pvt. Ltd.
Dhaka


swissôtel
swissôtel DHAKA
Deltadesh Pvt. Ltd.
Dhaka


Deltadesh Pvt. Ltd.
Dhaka


Deltadesh Pvt. Ltd.
Dhaka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Dhaka


Deltadesh Pvt. Ltd.
Dhaka


Deltadesh Pvt. Ltd.
Dhaka

Deltadesh Pvt. Ltd.
Dhaka


Deltagen Pvt. Ltd.
Dhaka


swissôtel


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Deltadesk Pvt. Ltd.
Dhaka

SECTION-14: BILL OF QUANTITY SCHEDULE

Bengal Hotels & Resorts Project
208, Tejgaon-Gulshan Link Road, Dhaka-1208, Bangladesh

BILL OF QUANTITY SCHEDULE FOR FACADE WORK

Date: 20/Aug/24

Sl.	Items	Unit	Total Qty	Brand	Country of Origin	Country of Manufacture	Supply of Imported items (CFR to CTG Port)		Supply of Local items (Excluding VAT & AIT)		Installation / Service (Excluding VAT & AIT)	
							Rate (USD)	Amount (USD)	Rate (BDT)	Amount (BDT)	Rate (BDT)	Amount (BDT)
1.0	**GLASS**											
1.1	**STRUCTURAL GLAZING CURTAIN WALL (GCW)**											
	Designing, Supplying, Fabricating, Fitting and Fixing of Semi-Unitized Structural Glass Curtain Wall with Argon filled Tempered Insulated Double Silver Low E Glass Panels of specified brand & color; Make and processed in glass manufacturer authorized factory outside Bangladesh with Powder Coated Aluminum Profiles of specified brand & color; Make Structural and Weather Sealant of specified brand & color with backer rod and installing the Fire Barrier with Rock-wool encased in solid Galvanized Steel sheet support (where applicable) at floor level, as per strict adherence to the Specification and approved Shop Drawings developed by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all associated accessories, GMS Embedded Parts, hardware and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of Project Architect/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials. Building Inside Noise Level will be as per ACCOR standard and Glass Parameter will be as per EDGE Green Certification Standard: U-value of 1.95 W/m² K SHGC of 0.28 VLT> 50%	Sqm	680					-	X	X		-
	As per the Structural Design performed by the Contractor:											
	FOR PUBLIC AREA: Considering Maximum Profile Depth 200mm excluding Glazing Frame:											
	a) Glass Thickness:											
	b) Horizontal Profile Size & Thickness:											
	c) Vertical Profile Size & Thickness:											

Deltatech Pvt. Ltd. Dhaka

Sl.	Items	Unit	Total Qty	Brand	Country of Origin	Country of Manufacture	Supply of Imported items (CFR to CTG Port)		Supply of Local items (Excluding VAT & AIT)		Installation / Service (Excluding VAT & AIT)	
							Rate (USD)	Amount (USD)	Rate (BDT)	Amount (BDT)	Rate (BDT)	Amount (BDT)
1.2	**SINGLE FLOOR GLAZING PANEL (SFGP)**											
	Designing, Supplying, Fabricating, Fitting and Fixing of Semi-Unitized Structural WIndow Frame System with Argon filled Tempered Insulated Double Silver Low E Glass Panels of specified brand & color; Make and processed in glass manufacturer authorized factory outside Bangladesh with Powder Coated Aluminum Profiles of specified brand & color; Make Structural and Weather Sealant of specified brand & color with backer rod and installing the Fire Barrier with Rock-wool encased in solid Galvanized Steel sheet support (where applicable) at floor level, as per strict adherence to the Specification and approved Shop Drawings developed by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all associated accessories, GMS Embedded Parts, hardware and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of Project Architect/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials. Building Inside Noise Level will be as per ACCOR standard and Glass Parameter will be as per EDGE Green Certification Standard: U-value of 1.95 W/m² K SHGC of 0.28 VLT> 50%	Sqm	1,260					-	X	X		-
	As per the Structural Design performed by the Contractor:											
	FOR PUBLIC AREA: Considering Maximum Profile Depth 200mm excluding Glazing Frame:											
	a) Glass Thickness:											
	b) Horizontal Profile Size & Thickness:											
	c) Vertical Profile Size & Thickness:											

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Sl.	Items	Unit	Total Qty	Brand	Country of Origin	Country of Manufacture	Supply of Imported items (CFR to CTG Port)		Supply of Local items (Excluding VAT & AIT)		Installation / Service (Excluding VAT & AIT)	
							Rate (USD)	Amount (USD)	Rate (BDT)	Amount (BDT)	Rate (BDT)	Amount (BDT)
1.3	**SINGLE FLOOR GLAZING PANEL (SFGP)**											
	Designing, Supplying, Fabricating, Fitting and Fixing of Semi-Unitized Structural WIndow Frame System with Argon filled Tempered Insulated Double Silver Low E Glass Panels of specified brand & color; Make and processed in glass manufacturer authorized factory outside Bangladesh with Powder Coated Aluminum Profiles of specified brand & color; Make Structural and Weather Sealant of specified brand & color with backer rod and installing the Fire Barrier with Rock-wool encased in solid Galvanized Steel sheet support (where applicable) at floor level, as per strict adherence to the Specification and approved Shop Drawings developed by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all associated accessories, GMS Embedded Parts, hardware and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of Project Architect/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials. Building Inside Noise Level will be as per ACCOR standard and Glass Parameter will be as per EDGE Green Certification Standard: U-value of 1.95 W/m² K SHGC of 0.28 VLT> 50%	Sqm	6,248					-	X	X		-
	As per the Structural Design performed by the Contractor:											
	FOR GUESTROOM: Considering Maximum Profile Depth 145mm excluding Glazing Frame:											
	a) Glass Thickness:											
	b) Horizontal Profile Size & Thickness:											
	c) Vertical Profile Size & Thickness:											

Sl.	Items	Unit	Total Qty	Brand	Country of Origin	Country of Manufacture	Supply of Imported items (CFR to CTG Port)		Supply of Local items (Excluding VAT & AIT)		Installation / Service (Excluding VAT & AIT)	
							Rate (USD)	Amount (USD)	Rate (BDT)	Amount (BDT)	Rate (BDT)	Amount (BDT)
1.4	**CASEMENT**											
	Designing, Supplying, Fabricating, Fitting and Fixing of Semi-Unitized Structural Casement Window Frame System with Argon filled Tempered Insulated Double Silver Low E Glass Panels of specified brand & color; Make and processed in glass manufacturer authorized factory outside Bangladesh with Powder Coated Aluminum Profiles of specified brand & color; Make Structural and Weather Sealant of specified brand & color with backer rod and installing the Fire Barrier with Rock-wool encased in solid Galvanized Steel sheet support (where applicable) at floor level, as per strict adherence to the Specification and approved Shop Drawings developed by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all associated accessories, GMS Embedded Parts, hardware and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of Project Architect/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials. Building Inside Noise Level will be as per ACCOR standard and Glass Parameter will be as per EDGE Green Certification Standard: U-value of 1.95 W/m² K SHGC of 0.28 VLT> 50%	Sqm	370					-	X	X		-
	As per the Structural Design performed by the Contractor:											
	a) Glass Thickness:											
	b) Horizontal Profile Size & Thickness:											
	c) Vertical Profile Size & Thickness:											

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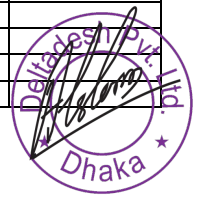
Sl.	Items	Unit	Total Qty	Brand	Country of Origin	Country of Manufacture	Supply of Imported items (CFR to CTG Port)		Supply of Local items (Excluding VAT & AIT)		Installation / Service (Excluding VAT & AIT)	
							Rate (USD)	Amount (USD)	Rate (BDT)	Amount (BDT)	Rate (BDT)	Amount (BDT)
2.0	**GLASS DOOR**											
2.1	**ALUMUNIUM FRAME GLASS SWING DOOR**											
	Designing, Supplying, Fabricating, Fitting and Fixing of Glass Swing Door System Tempered Laminated with PVB Mild Reflective Glass Panels/Argon filled Tempered Insulated Double Silver Low E Glass of specified brand & color; Make and processed in glass manufacturer authorized factory outside Bangladesh with Powder Coated Aluminum Profiles of specified brand & color; Make Structural and Weather Sealant of specified brand & color with backer rod and required hradware and accessories, as per strict adherence to the Specification and approved Shop Drawings developed by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all associated accessories, GMS Embedded Parts, hardware and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of Project Architect/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials. Building Inside Noise Level will be as per ACCOR standard.	Sqm	75					-	X	X		-
	As per the Structural Design performed by the Contractor:											
	a) Glass Thickness:											
	b) Horizontal Profile/Door Outer Size & Thickness:											
	c) Vertical Profile/Door Shutter Size & Thickness:											
2.2	**GLASS SLIDING DOOR (Automatic Sensor Door)**											
	Designing, Supplying, Fabricating, Fitting and Fixing of Glass Sliding Door System Tempered Laminated with PVB Mild Reflective Glass Panels of specified brand & color; Make and processed in glass manufacturer authorized factory outside Bangladesh compatible with approved make Sensor device and other accessories, as per strict adherence to the Specification and approved Shop Drawings developed by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all associated accessories, GMS Embedded Parts, hardware and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of Project Architect/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials. Building Inside Noise Level will be as per ACCOR standard.	Sqm	30					-	X	X		-
	As per the Structural Design performed by the Contractor:											
	a) Glass Thickness:											



Sl.	Items	Unit	Total Qty	Brand	Country of Origin	Country of Manufacture	Supply of Imported items (CFR to CTG Port)		Supply of Local items (Excluding VAT & AIT)		Installation / Service (Excluding VAT & AIT)	
							Rate (USD)	Amount (USD)	Rate (BDT)	Amount (BDT)	Rate (BDT)	Amount (BDT)
3.0	**GLASS CANOPY SOLUTION**											
	Designing, Supplying, Fabricating, Fitting and Fixing of epoxy or PU painted steel structural glass canopy suspended by epoxy or PU painted I-joist/ Point Fixing (spider) system composed of specially processed tempered laminated glass with SGP Panels of specified brand & color; Make and processed in glass manufacturer authorized factory outside Bangladesh with Epoxy/PU coated Aluminium Profiles; Make Structural and Weather Sealant of specified brand & color with backer rod, as per strict adherence to the Specification and approved Shop Drawings developed by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all associated accessories, hardware, I-Joist and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of Project Architect/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials. [Only I-Joist & steel rope will be supplied by Client]	Sqm	75					-	X	X		-
	As per the Structural Design performed by the Contractor:											
	a) Glass Thickness:											
	b) Profile Size & Thickness:											
4.0	**ALUMUNIUM COMPOSITE PANEL**											
	Designing, Supplying, Fabricating, Fitting & Fixing of Fire resistance PVDF coated Aluminum Composite Panel of 4mm thickness designed for exterior installation considering Groove for Linear Lighting, taking support from appropriate aluminum section framework fitted in applicable on RCC wall/ RCC frame structure (beam-column)/ masonry wall system; Make Structural and Weather Sealant of specified brand & color as per strict adherence to the Specification and approved Shop Drawings developed by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all Alumunium/Galvanized Runner for sub frame, associated accessories, hardware (if any) and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of Project Architect/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials.	Sqm	6,295					-	X	X		-
	As per the Structural Design performed by the Contractor:											
	a) Galvanized steel/Alumunium frame size & thickness:											

Sl.	Items	Unit	Total Qty	Brand	Country of Origin	Country of Manufacture	Supply of Imported items (CFR to CTG Port)		Supply of Local items (Excluding VAT & AIT)		Installation / Service (Excluding VAT & AIT)	
							Rate (USD)	Amount (USD)	Rate (BDT)	Amount (BDT)	Rate (BDT)	Amount (BDT)
5.0	**GLASS RAILING**											
	Supplying, Designing, Fabricating, Fitting and Fixing of specially processed Glass railing and balustrade system of glass and wood/stainless steel composed of tempered PVB/SGP Laminated Glass Panels of specified brand & color; Make and processed in glass manufacturer authorized factory outside Bangladesh with STS Profiles of specified brand & color; Make Structural and Whether Sealant of specified brand & color as per strict adherence to the Specification and approved Shop Drawings developed by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all associated accessories, hardware and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of to the satisfaction of Project Architect/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials.	Sqm	105					-	X	X		-
	As per the Structural Design performed by the Contractor:											
	a) Glass Thickness:											
	b) Stainless steel frame size & thickness											
6.0	**CLADDING**											
	Supplying, designing,fabricating,fitting and fixing of 4mm thick PVDF coated alumunium 3D Cladding as approved color by the consultant as per approved design drawing with necessary frame work including all related hardware and accessories. The work need to be done as per approved shop drawing developed by the by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all associated accessories, hardware and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of Project Architects/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials.	Sqm	900					-	X	X		-
	As per the Structural Design performed by the Contractor:											
	a) Alumunium/Galvanized Sub-frame size & thickness											

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Sl.	Items	Unit	Total Qty	Brand	Country of Origin	Country of Manufacture	Supply of Imported items (CFR to CTG Port)		Supply of Local items (Excluding VAT & AIT)		Installation / Service (Excluding VAT & AIT)	
							Rate (USD)	Amount (USD)	Rate (BDT)	Amount (BDT)	Rate (BDT)	Amount (BDT)
7.0	**SUNSCREEN ALUMINIUM PANEL**											
	Supplying, designing,fabricating,fitting and fixing of CNC cutted / designed 2.5mm thick PVDF coated alumunium panel as approved color by the consultant as per approved design drawing with necessary frame work including all related hardware and accessories. The work need to be done as per approved shop drawing developed by the by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all associated accessories, hardware and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of Project Architects/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials.	Sqm	130					-	X	X		-
	As per the Structural Design performed by the Contractor:											
	a) Alumunium/Galvanized Sub-frame size & thickness											
8.0	**BUILDING MAINTENANCE UNIT (BMU)**											
	Designing, Supplying, Fabricating, Fitting and Fixing of Aluminum working cradle 2.4m x 0.68m size, suitable for 250 kg safe working load with 2 nos traction hoist (European make), 4 nos independent motorized rope realer, centralized control panel and 2 nos slack rope safety device & all other accessories for its smooth operation; Aluminum alloy Davit with 1.5m-2.0m long swiveling jib & 1.5m-1.8m high mast Suitable for taking self-weight of cradle & workmen load; Roof mounted davit base / socket- fabricated out of MS plate & flat duly hot dip galvanized, to be fixed at RCC slab/pedestal having 4 nos SS anchor rod embedded during pedestal casting, Or 4 nos SS anchor rod with Hilti/Wuerth chemical, Size of base plate is 400x400x16(minimum)/as per design and Mechanical winch for davit installation; All complete as per the approved Design & Shop Drawings developed by the Contractor on the basis of the supplied Design and Drawings, complying to the required tests and in accordance of the Scope of Services, which include all associated accessories, hardware and support system substructure guaranteed for specified performance of the same after complete in all respect to the satisfaction of to the satisfaction of Project Architect/ Structural Consultant/ Engineer in Charge/PMC. The Contractor shall have to submit methodology and obtain prior approval from the Project Architect, Structural Consultant and Client for the Brand, Color and Make before opening of Letter of Credit for materials. The Structural Design will be performed by the Contractor.	Lot	1					-	X	X		-

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Sl.	Items	Unit	Total Qty	Brand	Country of Origin	Country of Manufacture	Supply of Imported items (CFR to CTG Port)		Supply of Local items (Excluding VAT & AIT)		Installation / Service (Excluding VAT & AIT)	
							Rate (USD)	Amount (USD)	Rate (BDT)	Amount (BDT)	Rate (BDT)	Amount (BDT)
9.0	**GENERAL**											
9.1	**Shop Drawing**	Job	1				X	X	X	X		-
	Preparation of detail Shop drawing including, layout drawing, section details, schematic drawing, etc. Get approval of shop drawing before any fabrication or installation works. Shop drawing must be coordinated with other services likely SIgnage, Electrical cabling, Light Fixtures, False Ceiling, HVAC Ducting, Interior design etc.											
9.2	**As-Built Drawing**	Job	1				X	X	X	X		-
	Preparation and submission of As-built drawing in following forms:											
	One set in tracing paper, size A1											
	Two sets print out in A1 Paper											
	Soft Copy in CD in AutoCAD Version 2016											
	Soft Copy in PDF Version											
9.3	**Performance Testing**	Job	1				X	X	X	X		-
	The system shall be tested, commissioned and balanced as per consultant's recommendation.											
	After proper testing, commissioning and balancing the system shall run for seven days up to the satisfaction of the Owner.											
	Submit advance copy of Installation, Operation and maintenance manuals.											
	The work includes training to the Owner's representative at site.											
9.4	**Pre-shipment Inspection**	Job	1				X	X	X	X	X	X
	Shall be carried out by 3rd party inspection at factory.											
9.5	**Any Other Item**	Job	1				X	X	X	X		-
	Any Item not mentioned in BOQ but require to complete the work completion.											

Sub-Total Cost (Excluding VAT & AIT) - - -

Note: Please read the enclosed Design drawings, Technical Specifications & other documents for Bidding before the price quotation

1 The bidder has to submit the Tender Drawing including Structural Design along with Technical Proposal
2 Cost for Custom Duty, VAT, ATV, Taxes, Port Charge, C&F Agent charge etc. for imported items shall be by the Client.
3 Cost for Unloading and Loading at port, Transport to site, Unloading at site, Storing and protective measure, etc. for imported items shall be by the Bidder.
4 X denotes item to be quoted under other column including supply of main and consumable materials with anything requires.
5 Installation includes supply by cosumable materials.
6 Contractor is to verify quantity of material before placement of order.
7 For all installation relevant codes BNBC to be followed.
8 No item or format of this BOQ can be changed. Any such deviation will be treated the bid "Disqualified". Bidder may use separate sheet for any minor deviation.
9 For local currency works payment shall be based on actual certified work measurement.
10 Bidder must have to quote price for all items mentioned. Any failure of this will be treated that he will do that item(s) as per design and BoQ and cost for that item is included in the costs of other items.
11 In case of any conflict between specification mentioned in these BoQ and main consultant's specification/drawing, priority shall be given to main Consultants specifications / drawings.
12 This documents include this BoQ, Bidding Documents with Conditions of Contracts, Design Drawings, etc.
13 The Bidder is to verify drawings. Any item found in drawing but not mentioned in BoQ is to notify to the Authority before Pre-Bid meeting in writing.
14 The BoQ schedule is furnished in Excel as well PDF Copy. In case of any conflict between these two formats and data, the PDF copy will govern.

CHAPTER : DESIGN CRITERIA

2.1 CODES AND STANDARDS

Table 2-1 Building Codes

SL. NO	CODE / STANDARD NAME	FOR	DESCRIPTION
1.	BNBC 2020	Wind/General	Bangladesh National Building Code 2020
2.	ASTM B429 – 02	Aluminum	Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube
3.	AA ADM – 2015	Aluminum	Aluminum Design Manual 2015
4.	AISC 360 – 05	Steel	Specification for Structural Steel Buildings
5.	ASTM E 1300 – 04	Glass	Standard Practice for Determining Load Resistance of Glass in Buildings
6.	AS 1288 – 2006	Glass	Australian Standard® Glass in buildings — Selection and installation
7.	ASTM C1401 – 02	Silicone	Standard Guide for Structural Sealant Glazing

2.2 MATERIALS SPECIFICATION

Table 2-2 Properties of Aluminum (Alloy 6063 T5)

Properties	Values				Reference
Modulus of Elasticity, E	70000	N/mm^2	10100	*ksi*	
Density, ρ	2710	Kg/m^3	169	lb/ft^3	
Modulus of rigidity, G	26600	N/mm^2	3800	*ksi*	
Poisons ratio, U	0.33	-	-	-	
Yield / Limiting strength, F_y	110	N/mm^2	16	*ksi*	*; Table A.3.3M,* ***ADM 2015***
Ultimate strength, F_u	150	N/mm^2	22	*ksi*	

Table 2-3 Properties of Aluminum (Alloy 6063 T6)

Properties	Values				Reference
Modulus of Elasticity, E	70000	N/mm^2	10100	*ksi*	
Density, ρ	2710	Kg/m^3	169	lb/ft^3	
Modulus of rigidity, G	26600	N/mm^2	3800	*ksi*	
Poisons ratio, U	0.33	-	-	-	
Yield / Limiting strength, F_y	172	N/mm^2	25	*ksi*	*; Table 2,* ***ASTM B429 – 02*** *; Table A.3.3M,* ***ADM 2015***
Ultimate strength, F_u	207	N/mm^2	30	*ksi*	

Table 2-4 Properties of Aluminum (Alloy 6061 T6)

Properties	Values				Reference
Modulus of Elasticity, E	70000	N/mm^2	10100	*ksi*	
Density, ρ	2710	Kg/m^3	169	lb/ft^3	
Modulus of rigidity, G	26600	N/mm^2	3800	*ksi*	
Poisons ratio, U	0.33	-	-	-	
Yield / Limiting strength, F_y	241	N/mm^2	35	*ksi*	*; Table 2,* ***ASTM B429 – 02***
Ultimate strength, F_u	262	N/mm^2	38	*ksi*	*; Table A.3.3M,* ***ADM 2015***

TABLE 2 Tensile Property Limits[A,B,C]

Alloy Temper	Specified Wall Thickness, in.	Tensile Strength, min, ksi (MPa)°	Yield Strength, min, ksi (MPa)[D]	Elongation in2 in. or 4 × Di-ameter, min, %[E]
6061-T6	*up thru* 0.249	38.0 (262)	35.0 (241)	8
	0.250 and over	38.0 (262)	35.0 (241)	10
6063-T6	*up thru* 0.124	30.0 (207)	25.0 (172)	8
	0.125–1.000	30.0 (207)	25.0 (172)	10

[A] To determine conformance to this specification, each value for tensile strength and for yield strength shall be rounded-off to the nearest 0.1 ksi and each value for elongation to the nearest 0.5 percent, both in accordance with the rounding-off method of Practice E 29.

[B] Specimens shall be tested parallel to the direction of working.

[C] The basis for establishment of mechanical property limits is shown in Annex A1.

[D] For explanation of the SI unit MPa, see Appendix X2.

[E] Elongation of full-section and cut-out sheet-type specimens is measured in 2 in.; of cut-out round specimens, in 4 × specimen diameter.

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Table 2-5 Properties of Glass

Properties	Values	Units	Reference
Modulus of Elasticity, E	71700	N/mm^2	
Density, ρ	2500	Kg/m^3	
Poisson's Ratio, U	0.25	-	
Allowable surface stress (Fully Tempered)	93.1	N/mm^2	; ***ASTM E 1300, X8.2***
Allowable surface stress (Heat Strengthened)	46.6	N/mm^2	
Allowable surface stress (Annealed)	23.3	N/mm^2	

X8. APPROXIMATE MAXIMUM SURFACE STRESS TO BE USED WITH INDEPENDENT STRESS ANALYSES

X8.1 The purpose of this appendix is to provide a conservative technique for estimating the maximum allowable surface stress associated with glass lites continuously supported along all edges of the lite. The maximum allowable stress (*allowable*) is a function of area (A), load duration in seconds (d), and probability of breakage (P_b).

X8.2 This maximum allowable surface stress can be used for the design of special glass shapes and loads not covered elsewhere in Practice E 1300. This includes trapezoids, circular, triangular, and other odd shapes. A conservative allowable surface stress value for a 3-s duration load is 23.3 MPa (3 380 psi) for annealed glass, 46.6 MPa (6 750 psi) for heat-strengthened glass, and 93.1 MPa (13 500 psi) for fully tempered glass.

X8.3 The maximum allowable surface stress in the glass lite should be calculated using rigorous engineering analysis, which takes into account large deflections, when required. This maximum calculated stress must be less than the maximum allowable stress.

X8.4 Maximum allowable surface stress is calculated using the following equation which has its basis in the same glass failure prediction that was used to develop the non-factored load charts in Section 6.

$$\sigma_{allowable} = \left(\frac{P_B}{[k\,(d/3)^{7/n} * A]} \right)^{1/7} \quad \text{(X8.1)}$$

where:

$\sigma_{allowable}$ = maximum allowable surface stress,
P_B = probability of breakage,
k = a surface flaw parameter,
d = the duration of the loading,
A = the glass surface area, and
n = 16 for annealed glass.

X8.5 The non-factored loads that are determined in this manner should be conservative with respect to the values presented in Section 6.

X8.6 Eq X8.1 is applicable where the probability of breakage (P_b) is less than 0.05. (Note that Section 6 references a P_b less than or equal to 0.008.)

Table 2-6 Properties of Steel (EN S275)

Properties	Values			
Modulus of Elasticity, E	205000	N/mm^2	*29000*	*ksi*
Density, ρ	7850	Kg/m^3	*490*	lb/ft^3
Poisons Ratio, U	0.3	-	-	-
Yield Strength, F_y	275	N/mm^2	*40*	*ksi*
Ultimate Strength, F_u	430	N/mm^2	*62*	*ksi*

Table 2-7 Properties of Steel (ASTM A36)

Properties	Values			
Modulus of Elasticity, E	210000	N/mm^2	*29000*	*ksi*
Density, ρ	7850	Kg/m^3	*490*	lb/ft^3
Poisons Ratio, U	0.3	-	-	-
Yield Strength, F_y	248.2	N/mm^2	*36*	*ksi*
Ultimate Strength, F_u	400	N/mm^2	*58*	*ksi*

Table 2-8 Properties of Steel (ASTM A500)

Properties	Values			
Modulus of Elasticity, E	210000	N/mm^2	*29000*	*ksi*
Density, ρ	7850	Kg/m^3	*490*	lb/ft^3
Poisons Ratio, U	0.3	-	-	-
Yield Strength, F_y	317.5	N/mm^2	*46*	*ksi*
Ultimate Strength, F_u	400	N/mm^2	*58*	*ksi*

SECTION-15: HEALTH, SAFETY AND ENVIRONMENT PLAN

Notes on Health, Safety and Environment Plan

The Health, Safety and Environment Plan. The actual Health, Safety and Environment Plan, including site Safety, Security and Protection of the Environment, is attached as a separate file.