Tender Documents

for

Minor Works at G/F, G.T. (Ellen Yeung) College

at

No.10 Ling Kwong Street, Tiu Keng Leng, Tseung Kwan O

Ben Yeung & Associates Ltd Architect

March 2023

Project No: 61054B

Project :Minor Works at G/F, G.T. (Ellen Yeung) College

TENDER DOCUMENT

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CONDITIONS OF TENDER

CONDITIONS OF TENDER

Minor Works at Multi-purpose Rooms on G/F at G.T. (Ellen Yeung) College

Contract'

1.	The tender docume	nts	
	issued consist of	:	 a) A booklet containing: (i) Conditions of Tender (ii) Form of Tender (iii) General Conditions of Contract (iv) Special Conditions of Contract (v) General Specification (vi) Specification Preliminaries (vii) Particular Specification (viii) Schedule of Rates (iv) Summary of Tender (v) Schedule of Drawings
			b) One set of tender drawings
			c) One duplicate Form of Tender
2.	Project Title	:	Minor Works at Multi-purpose Rooms on G/F at G.T. (Ellen Yeung) College
3.	Owner	:	G.T. (Ellen Yeung) College
4.	Architect	:	Ben Yeung & Associates Ltd Room C, 1/F, Easy-pack Industrial Building, 140 Wai Yip Street, Kwun Tong, Kowloon
5.	Contact Person	:	Mr. Aiken Kwok
6.	Construction Period	:	45 calendar days, 'including Sundays and general holidays, from the Date of Possession, or within any extended time which may be authorized under the terms of the Conditions of

Minor Works at Multi-purpose Rooms on G/F at G.T. (Ellen Yeung) College

- 7. Tender Document : The Tender is to be enclosed in a sealed envelope labelled tender for "Minor Works at Multi-purpose Rooms on G/F at G.T. (Ellen Yeung) College" and deposited at the time and place set out in the invitation to tender.
- 8. Form of Contract : The Form of Contract will be the "Agreement and Schedule of Conditions of Building Contract for use in Hong Kong Private Edition Without quantities, 2006 Edition" under the sanction of the Hong Kong Institute of Architects, The Hong Kong Institute of Surveyors and The Society of Builders, Hong Kong together with the amendments to the Conditions of Contract hereinafter described.
- 9. Return tender : a) The booklet referred to at 1 (a) above with the Summary of Tender completed and the Form of Tender duly completed, signed, witnessed and dated. The total of the Summary of Tender must agree with the sum shown on the Form of Tender'.
 - b) Schedule of Rates shall be duly and fully priced in ink, extended, cast and totaled. The value of any items not priced shall be deemed to be included in the Tender Sum.
 - c) The duplicate Form of Tender duly completed, signed, witnessed and dated.
 - d) Proposed programmes of construction (For reference only and not form part of the Contract).
 - e) Copy of the ISO 9000 certificate (For reference only and not form part of the Contract).
- 10. Conditions of : a) awards of contract
- a) Owner has the right to award the contract to any tenderer disregarding the tender price.
 - b) Owner has the right to reject all tenders.
- 11. Date of awards : Tentatively in mid May 2023 of contract
- 12. Tender Validity : 90 calendar days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiry of that period.
- 13. All Tenders shall be in Hong Kong dollars and no adjustment will be made for fluctuation in exchange rates of currencies.

Minor Works at Multi-purpose Rooms on G/F at G.T. (Ellen Yeung) College

- 14. <u>Errors & Discrepancies</u>
 - a) In the event of a tenderer discovering a genuine mistake in his tender after dispatch he may draw attention in writing to the error and submit an amendment which may be accepted provided it is received before the time fixed for the receipt of tenders.
 - b) Without prejudice to other Conditions of Tender, if error & discrepancies are found in the tender during tender examination, such errors & discrepancies shall be dealt with in accordance with the principles and rules contained in Environment, Transport and Works Bureau Technical Circular (Works) No. 41/2002.
 - c) Without prejudice to the other Conditions of Tender, if the tenderer includes a lump sum or percentage adjustment to any rate or trade or other summary, such quoted adjustment shall be applied as for the adjustment of erros & discrepancies as set out in Environment, Transport and Works Bureau Technical Circular (Works) No. 41/2002.
 - d) The foregoing procedure may be applied at any time prior to acceptance of a tender but neither the Employer nor the Architect undertakes any responsibility towards any tenderer for any error or discrepancy which is not discovered during the Architect examination of tenders.
 - e) In the event the Architect determines that clarification of any point of the submitted tenders is necessary, he will advise the tenderer in writing. The tenderer shall clarify the queries within four days in writing.
- 15. <u>Unauthorized Alterations, Amendments & Qualifications, etc.</u>

No unauthorized alterations, amendments and qualifications, etc. to the text of the tender documents will be permitted except in addendum issued by the architect.

Any qualification of Tender may cause the Tender to be disqualified.

16. <u>Cost of Tendering</u>

Tenderers will not be reimbursed for any expense incurred in the preparation of submission of their tenders.

17. The Tenderer will be responsible and will be deemed to have checked and verified all relevant measurements on site. Before submitting the Tender, each Tenderer must (1) examine the Tender Document thoroughly, (2) visit the site to familiarize himself with local conditions that may in any manner affect performance of the works, (3) familiarize himself with all house rules, management fitting out guide lines and all government regulations of the site affecting performance of the Works, and (4) carefully correlate his observations with the requirement of the Tender Documents. The submission of a Tender will serve as a representation by the Tenderer that he has complied with the aforesaid requirements. No claims arising from failure to do so will be considered.

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- 18. <u>Specification</u>
 - a) The specification to be used for this Contract (hereinafter referred to as the Specification shall be):
 - i) The General Specification;
 - ii) The Specification Preliminaries; and
 - iii) The Particular Specification.

The Tender shall be deemed to have allowed in his prices for all costs incurred in complying inter-alia with the relevant materials and workmanship clauses therein. Wherever there are discrepancies between the Particular Specification and the General Specification, the Particular Specification shall take precedence.

- b) The tenderer shall be deemed to have made allowance in his prices generally to cover items contained in the Specification Preliminaries, expense in connection with Prime Cost, Provisional and other items if these have not been priced against the respective items.
- c) The tenderer shall be deemed to have allowed in his prices that night time work may be required through out the whole construction period. No claim for night time work and for extension of time and/or costs shall be considered by the Architect if the contractor is prevented from carrying out night time work.
- 19. Liquidated Damages is **HK\$2000 per day**
- 20. Defects Liability Period is <u>**12 months**</u> after practical completion of the project.
- 21. Contractor to be responsible but not limited to comply with the building management/owner's fitting out/refurbishment guideline and requirement.
- 22. Contractor shall suspend work immediately if works which cause nuisance/noise/ dusty to the occupants/visitors of the clinic upon the notice as given by the Employer and/or the Architect and/or his representatives.
- 23. Anti-collusion
 - (1) The tenderer shall nor communicate to any person other than the Employer the amount of any tender, adjust the amount of any tender by arrangement with any other person, make any arrangement with any other person about whether or not he or that other person should or should not tender or otherwise collude with any other person in any manner whatsoever in the tendering process until the tenderer is notified by the Employer of the outcome of the tender exercise. Any breach of or non-compliance with this sub-clause by the tenderer shall, without affecting the tenderer's liability for such breach or non-compliance, invalidate his tender.

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- (2) Sub-clause (1) of this Clause shall have no application to the tenderer's communications in strict confidence with his own insurers or brokers to obtain an insurance quotation for computation of tender price and communications in strict confidence with his consultants or sub-contractors to solicit their assistance in preparation of tender submission.
- 24. Offering Gratuities

The tenderer shall not and shall ensure that his agents, consultants and employees shall not offer or give any advantage, gratuity, bonus, discount, bribe or loan of any sort to any agent or employee of the Employer or to the Architect designate or to any member of the Architect designate's staff. Any breach of or non-compliance with this Clause by the tenderer shall, without affecting the tenderer's liability for such breach or non-compliance, invalidate his tender.

- 25. Ethical Commitment
 - (1) The tenderer shall not, and shall procure that his employees, agents and sub-contractors shall not, offer, solicit or accept an advantage as defined in the Prevention of Bribery Ordinance, Cap. 201 I connection with the tendering and execution of this contract.
 - (2) Failure to so procure or any act of offering, soliciting or accepting advantage referred to in (1) above committed by the tenderer or by an employee, agent or sub-contractor of the tenderer shall, without affecting the tenderer's liability for such failure and act, result in his tender being invalidated.
- 26. One Tender Only For Holding Companies or Subsidiaries
 - (1) Unless otherwise provided in the Conditions of Tender, no tenderer is permitted to submit more than one tender for each contract.
 - (2) A holding company and all of its subsidiaries who are included in the List of General Building Contractor Registration under Buildings Department or Approved Contractors for Public Works under the category of Buildings Group A or B or C shall be allowed to submit only one tender from any one of the company in the group. The existence of a holding-subsidiary relationship shall be determined in accordance with the provisions in Section 2(4) to (8) of the Company Ordinance (Cap. 32).
 - (3) Failure to observe the above conditions shall render all related tenders null and void and any such tenders shall not be considered.

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- 27. Special Conditions of Tender
 - a. Statement of convictions under the Immigration Ordinance (Cap. 115)
 - Attachment A
 - b. Statement of convictions under the Factories & Industrial Undertakings Ordinance (Cap. 59)

- Attachment B

c. Statement of convictions under the Employment Ordinance (Cap. 57) - Attachment C

Statement of Convictions under the Immigration Ordinance (Cap. 115)

1) A tender will not be considered if, during the 12 month period prior to the tender closing dated, the tenderer has more than two convictions in respect of separate incidents under Sections 171 or 38A of the Immigration Ordinance (Cap. 115) for employing illegal immigrants or for having illegal immigrants on any site under the tenderer's control. If the tenderer is a partnership, consortium or joint venture, the tender will not be considered if any member of the partnership, consortium or joint venture has more than two such convictions during the 12 month period.

Provide that the tender may be considered if during the 12 month period prior to the date which is 40 days from and including the tender closing date, the tenderer or, if the tenderer is a partnership, consortium or joint venture, any member of the partnership, consortium or joint venture has no more than two such convictions.

- 2) The tenderer shall submit with the tender <u>either</u> a statement of all convictions under Sections 171 or 38A of the Immigration Ordinance (Cap. 115) for employing illegal immigrants or for having illegal immigrants on any site under the tenderer's control, and the dates of all such convictions, during the 12 month period prior to the tender closing date, <u>or</u> a statement of "no conviction". The statement shall be certified by a person authorized to sign Government contracts on the tenderer's behalf.
- 3) If the tenderer has more than two such convictions during the 12 month period prior to the tender closing date, he shall, within two days upon the expiry of the 40 day period after the tender closing date, submit <u>either</u> a statement of all convictions under Sections 171 or 38A of the Immigration Ordinance (Cap. 115) for employing illegal immigrants or for having illegal immigrants on any site under the tenderer's control, and the dates of all such convictions, during the 12 month period prior to the date which is 40 days from and including the tender closing date, <u>or</u> a statement of "no conviction". The statement shall be certified by a person authorized to sign Government contracts on the tenderer's behalf.
- 4) If the tenderer is a partnership, consortium or joint venture, each member of the partnership, consortium or joint venture shall submit such a statement.

Attachment B

<u>Statement of Convictions under the Factories and Industrial Undertakings Ordinance</u> (Cap. 59), the Occupational Safety and Health Ordinance (Cap. 509) and the Shipping and Port Control Ordinance (Cap. 313)

- 1) A tender will not be considered if, by the tender closing date, the tenderer or, if the tenderer is a partnership, consortium or joint venture, any member of the partnership, consortium or joint venture is suspended from tendering under the provisions of Works Bureau Technical Circular No. 24/2000 in respect of repeated convictions for site safety violations, or the occurrence of serious incidents on site, unless the suspension is lifted within 40 days from and including the tender closing date.
- 2) The tenderer shall submit with the tender <u>either</u> a statement of all convictions under the Factories and Industrial Undertakings Ordinance (Cap. 59), the Occupational Safety and Health Ordinance (Cap. 509) and the Shipping and Port Control Ordinance (Cap. 313), for site safety convictions for all sites under the tenderer's control during the 12-month period prior to the tender closing date, the details of which shall include the legislation violated, dates of offences, dates of convictions and the associated fine imposed by the court, site addresses, contract numbers and contract titles, <u>or</u> a statement of "no conviction". The statement shall be certified by a person authorized to sign Government contracts on the tenderer's behalf.
- 3) If the tender is a partnership, consortium or joint venture, each member of the partnership, consortium or joint venture shall submit such a statement.

<u>Statement of Convictions under the Employment Ordinance (Cap. 57)</u>

1) A tender will not be considered if, during the 12 month period prior to the tender closing dated, the tenderer has had three or more convictions in respect of separate incidents under Employment Ordinance (Cap. 57) which individually carry maximum fines corresponding to Level 5 or higher within the meaning of Schedule 8 to the Criminal Procedure Ordinance (Chapter 221), whether or not he has been formally suspended as a result of such convictions. If the tender is a partnership, consortium or joint venture, the tender will not be considered if any member of the partnership, consortium or joint venture has three or more such convictions during the 12 month period, whether or not that member has been formally suspended as a result of such convictions.

Provided that the tender may considered if during the 12 month period prior to the date which is 40 days from and including the tender closing date, the tenderer or, if the tenderer is a partnership, consortium or joint venture, any member of the partnership, consortium or joint venture has no more than two such convictions.

- 2) The tenderer shall submit with the tender <u>either</u> a statement of all convictions under the Employment Ordinance (Cap. 57), and the dates of all such convictions, during the 12 month period prior to the tender closing date, <u>or</u> a statement of "no conviction". The statement shall be certified by a person authorized to sign Government contracts on the tenderer's behalf.
- 3) If the tenderer has more than two such convictions during the 12 month period prior to the tender closing date, he shall within two days upon the expiry of the 40 day period after the tender closing date, submit <u>either</u> a statement of all convictions under the Employment Ordinance (Cap. 57), and the dates of all such convictions, during the 12 month period prior to the date which is 40 days from and including the tender closing date, <u>or</u> a statement of "no conviction". The statement shall be certified by a person authorized to sign Government contracts on the tenderer's behalf.

If the tenderer is a partnership, consortium or joint venture, each member of the partnership, consortium or joint venture shall submit such a statement.

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In all cases, the tenderer must give the number and date of the Business Registration Certificate here:

Number	Date of Expiry
General Building Contractor Registration No.	Date of Expiry
Approved Contractor for Public Works under c	ategory Buildings Group

To: G.T. (Ellen Yeung) College

1. Having inspected the Site and examined the Drawings, Conditions of Contract and Appendix thereto, and Specification for the execution of the above named Works, I/We offer to execute, design (insofar as required under the Contract), construct, complete and maintain the whole of the said Works in conformity with the said Conditions, Drawings, Specification and Schedules of Rates in the sum of Hong Kong Dollars _____

(HK\$ _____) or such sum as may be ascertained in accordance with the said Conditions, Drawings, Specification and Schedules of Rates.

- 2. I/We undertake if my/our tender is accepted to complete and deliver the whole of the Works within a period of <u>45 calendar days (including Sundays and public holidays)</u> after the date for possession of site or any extended time which may be authorized under the terms of this tender.
- 3. I/We agree to abide by this tender for a period of 150 calendar days from the date fixed for receiving the same and it shall remain binding upon me/us and may be accepted at any time before the expiration of that period.
- 4. Unless and until a formal agreement is prepared and executed this tender together with the written acceptance thereof by the Architect on behalf of the Employer subject to the provisions of Clause 3 hereof shall constitute a binding Contract.
- 5. I/We understand that the Employer is not bound to accept the lowest or any tender which may be received.
- 6. I/We are aware of and accept the amendments to the Standard Conditions of Contract as described in the Special Conditions of Contract.
- 7. I/We agree to bear all costs incurred by me/us in connection with the preparation and submission of this Tender whether or not successful and to bear any further costs incurred by us prior to award of any Contract.

- 8. The Form of Tender is submitted in <u>duplicate</u>.
- ** 9. We, being the principal contractor of the captioned Project, hereby confirm that we have no business or other legal relationship with Ben Yeung & Associates Ltd, the Architect of the same Project.

Sign & Chop :

Name	
Signature	
In the capacity of	
duly authorized to sign ten	ders for and on behalf of **
Registered address of firm	
Business Registration No	Date of Expin
Date	
Name of Witness	
Signature of Witness	
Occupation of Witness	
Address of Witness	

** In the case of a limited Company, insert the name of the Company.

If a tender is being made by a partnership or an unincorporated body, the names and residential addresses of all partners shall be given in the spaces provided below.

Names of Partners

Residential Address of Partners

APPENDIX TO FORM OF TENDER

	Clause		Clause
Time for submission of master programme (if not stated, 42 days of acceptance of the Contractor's tender) 7 calendar days	3.1	Liquidated and Ascertained Damages At the rate of HK\$2000.00 per calendar day	24.2
Defects Liability Period (if not stated, 12 months from Substantial Completion of the Works) <u>12 months</u>	17.3:	Period of Interim Certificates (if not stated, 1calendar month) <u>1 calendar month</u>	32.1
Limit of indemnity to third party liability insurance against injury or death to any person: HK\$20,000,000.00	21.2	Period for payment of certificates (if not stated, within 14 days from the date of the certificate) <u>14 days</u>	32.1
Limit of indemnity to third party liability insurance against injury or damage to real or personal property: <u>HK\$20,000,000.00</u>	21.2	Retention Percentage (if not stated, 10 percent) <u>10%</u>	32.4
Insurance of the Works Clause 22A	22.1	Limit of Retention 5% of Contract Sum	32.4
Percentage to cover professional fees <u>8%</u>	22.2	Period of completion of the final account <u>12 months from the Date of</u> <u>Substantial Completion of the</u> <u>Works</u>	32.6

	Clause		Clause
Date of Possession of the Site	23.1	Amount of Surety Bond	33.1
Upon Architect's written		10% of Contract Sum	
instruction			
Commencement Date	23.2	Fluctuations	38
Upon Architect's written		Not Applicable	
<u>instruction</u>			
Completion Date	23.2		
45 calendar days from Date of			
Possession of Site			

GENERAL CONDITIONS OF CONTRACT

GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract shall be the "Agreement and Schedule of Conditions of Building Contract for use in the Hong Kong Special Administrative Region, Private Edition (Without Quantities), 2006 Edition" together with its Appendix issued under the sanction of the Hong Kong Institute of Architects, the Royal Institution of Chartered Surveyors (Hong Kong Branch) and the Society of Builders, Hong Kong.

Although a copy of the General Conditions of Contract is not issued with these documents, the contractor is advised to arrange for themselves a copy of such contract for their reference and use.

SPECIAL CONDITIONS OF CONTRACT

SPECIAL CONDITIONS OF CONTRACT

These Special Conditions of Contract are to be read in conjunction with the General Conditions of Contract and its Appendix. Wherever these Special Conditions vary from the General Conditions, the terms of the Special Conditions shall take precedence.

The Contractor should study the General Conditions of Contract in conjunction with the particulars to be inserted in the Appendix to the Form of Tender together with the Special Conditions of Contract.

Index to the Special Conditions of Contract:

Not used
Not used
Not used
Architect's Instructions
Documents forming the Contract and other documents
Not used
Not used
Materials, Goods and Workmanship to Conform to Description, Testing and Inspection
Not used
Contract Sum
Not used
Insurance of the Works
Possession, Commencement and Completion
Not used
Extension of Time
Not used
Loss and Expense Caused by Disturbance of Regular Progress of the Works
Not used
Nominated Sub-Contractors and Suppliers
Not used
Fluctuation in Wage Rates
Not used

Amendments to the Conditions

The clause number in bracket appears at the end of the heading of SCC clause refers to the clause number used in the General Conditions of Contract.

SCC-4 Architect's Instructions (Clause 4)

It is expressly agreed that the following clause shall be added to the clause 4.1 of the Conditions:-

"All instructions shall be issued by the Architect in writing. The Architect shall be empowered to issue instructions at any time, including that time when the Main Contractor is continuing to execute the Works or any Section thereof beyond the Date for Completion or Date for Completion of the relevant Section stated in relation thereto in the Appendix of these Conditions or beyond any extended time fixed under clause 25 of the Conditions."

SCC-5 Documents forming the Contract and other documents (Clause 5)

It is expressly agreed that the following clause shall be added to the end of clause 5.12 Submission of As-built Drawings of the Conditions:-

"The as-built drawings to be provided by the Contractor shall be in the format of AutoCAD 2008 or higher version."

SCC-8 <u>Materials, Goods and Workmanship to Conform to Description, Testing and</u> Inspection (Clause 8)

It is expressly agreed that the following clause shall be added to the end of clause 8.3 of the Conditions:-

"Failure of the Architect to disapprove any work, materials or goods which are not in accordance with this Contract shall not prejudice the power of the Architect subsequently to instruct the removal from the site of such work, materials or goods."

"The Contractor shall notify the Architect in writing before work is covered up and give him at least two full days notice to inspect it. Unless the Contractor does so, no charge shall be incurred by the Employer for opening up, testing and making good nor will any extension of time be granted in this respect."

SCC 15 <u>Contract Sum (Clause 15)</u>

It is expressly agreed that the following clause shall be added to Clause 15 of the Conditions:-

"Where the price for a section of the Works is a lump sum price based on the Contract Drawings and Specification, i.e. without Bills of Quantities prepared by the Quantity Surveyor, the quality and quantity of the work for such section included in the Contract Sum shall be deemed to be that which is shown upon or implied from the Contract Drawings or described in the Specification. Where a schedule of rates upon which the lump sum prices for such section of the work was based has been submitted by the Contractor and accepted by the Employer, the prices in the schedule of rates shall be used in the valuation of variations to such section of the work as described in Clause 13 of the Standard Conditions of Contract."

SCC-22 Insurance of the Works (Clause 22)

It is expressly agreed that clause 22.4(1) of the Conditions shall be supplemented by the following:-

The Term "until 14 days after the issue of the Substantial Completion Certificate for the Works" in the Conditions of Contract shall be replaced by "until the issue of the Defects Rectification Certificate for the whole of the Works."

SCC-23 Possession, Commencement and Completion (Clause 23)

It is expressly agreed that clause 23.1 of the Conditions shall be supplemented by the following:-

"The term "Date for Possession" in the Conditions of Contract shall be replaced by "Date for Commencement" which shall be notified in writing by the Architect. The Main Contractor shall commence the Works on the Date for Commencement stated in the appendix to these Conditions and shall thereupon begin the Works and regularly and diligently proceed with the same, and shall complete the same on or before the Date for Completion stated in the said appendix subject nevertheless to the provisions for extension of time contained in clauses 25 of these Conditions."

SCC-25 Extension of Time (Clause 25)

> It is expressly agreed that clause 25.1(3)(j)(iii) of the Conditions shall be supplemented by the following:-

> the postponement or suspension was caused by any work due to the Main Contractor's failure or default in compliance with the Specification, Drawings or Architect's Instructions;

SCC-27 Loss and Expense Caused by Disturbance of Regular Progress of the Works (Clause 27)

It is expressly agreed that clause 27.1(2)(e)(iii) of the Conditions shall be supplemented by the following:-

- the postponement or suspension was caused by any work due to the Main Contractor's failure or default in compliance with the Specification, Drawings or Architect's Instructions;
- SCC-29 Nominated Sub-Contractors and Suppliers (Clause 29)

It is expressly agreed that this clause shall be deleted from this Contract. SCC/3

SCC-38 Fluctuation in Wage Rates (Clause 38)

It is expressly agreed that this clause shall be deleted from this Contract.

GENERAL SPECIFICATION

GENERAL SPECIFICATION

1. <u>Specifications and Associated Documents</u>

- (1) The Specifications referred to in the Contract consist of:
 - (a) The General Specification which comprises:

General Specification for Building, 2022 Edition, with its Explanatory Notes, Amendments and Summary of Major Changes, issued by Architectural Services Department, the Government of the Hong Kong SAR together with any explanatory notes, corrigenda and major changes current at the date for the submission of tenders for the Contract.

Except Section 1 - Preliminaries of the General Specification which is deleted and replaced by the Specification Preliminaries in this document, all workmanship and material requirements shall follow the standards laid out in the General Specification.

General Specification for Building Services Installation in Government Buildings of the Hong Kong Special Administrative Region, 2022 Edition, issued by Architectural Services Department, the Government of the Hong Kong SAR;

Testing and Commissioning Procedure for Air-conditioning, Refrigeration and Mechanical Ventilation Installation in Government Buildings of the Hong Kong Special Administrative Region, 2022 Edition, issued by Architectural Services Department, the Government of the Hong Kong SAR;

Testing and Commissioning Procedure for Electrical Installation in Government Buildings of the Hong Kong Special Administrative Region, 2022 Edition, issued by Architectural Services Department, the Government of the Hong Kong SAR;

Testing and Commissioning Procedure for Fire Service Installation in Government Buildings of the Hong Kong Special Administrative Region, 2022 Edition, issued by Architectural Services Department, the Government of the Hong Kong SAR;

Testing and Commissioning Procedure for Drainage Installation in Government Buildings of the Hong Kong Special Administrative Region, 2022 Edition, issued by Architectural Services Department, the Government of the Hong Kong SAR;

Testing and Commissioning Procedure for Plumbing Installation in Government Buildings of the Hong Kong Special Administrative Region, 2022 Edition, issued by Architectural Services Department, the Government of the Hong Kong SAR;

Any explanatory notes and summary of major changes current at the date for the submission of tenders for the Contract;

- (b) All works and materials shall comply with the latest statutory obligations, ordinances, regulations, specification and Codes of Practice of the following:-
 - 1) Electrical & Mechanical Services Department (HK)
 - 2) HKFSD Codes of Practice, LPC Rules and FOC Rules
 - 3) The IET Wiring Regulations (18th Edition)
 - 4) Supply Rules of the Power Supply Company

- 5) Labor Department
- 6) Code of Practice for the Electricity (Wiring) Regulation, EMSD (HK)
- 7) Building Authority (HK)
- 8) Client's Standard Requirement
- 9) Building management office Requirement
- 10) Code of Practice for Energy Efficiency of Building Services Installation 2018 Edition
- (c) The Particular Specification in this document; and
- (d) The Particular Specification Building Services Installation in this document.
- (2) The Specifications shall be read in conjunction with the following
 - (a) The Agreement and General Conditions of Contract, Special Conditions of Contract (if any);
 - (b) Specification Preliminaries;
 - (c) Schedule of Rates; and
 - (d) Tender Drawings.
- (3) Should there be any discrepancies found between the General Specification and the Particular Specification in this document, the latter shall always take precedence.

(4) Operation and Maintenance Manuals

- a) Two months before system commissioning, detail testing and commissioning schedules and commissioning form shall be submitted for comments and endorsement by M&E Consultant.
- b) Two months before commencement of the maintenance period, the Contractor shall submit in triplicate Comprehensive Draft Operation and Maintenance Manuals and Instructions to the M&E Consultant for endorsement.
- c) The contents of O&M manual shall include but not limited to the followings:-
 - 1. General information

Description of the project such as location of the project, project commencement & completion date and defects liability period.

Description of the installations.

Consultant's information such as name of Consultant, address, Engineerin-charge and contact telephone no.

Contractor's information such as name of Contractor, address, Engineerin-charge, contact telephone no. and emergency call no. Content page with page numbering.

- 2. Routine maintenance schedule
- 3. Legible copy of statutory certificates

For electrical installation, they are WR1, WR1(A) and so on.

For A/C installation, they are ventilation certificate, fire damper certificate, WR1(A) and so on.

4. Equipment schedule

The equipment schedule shall include but not limited to the followings:-

For electrical installation, they are all cables, contactors, timer and so on.

For air-conditioning installation, they are Split type and Window type A/C units, exhaust fans, fresh air system, insulation materials, thermostat, electrical protective devices and so on.

- 5. Test results/records
- 6. Catalogue

The required catalogue shall include the items mentioned in material schedule and legible copies (of catalogue) are required if copied version used.

7. Operating procedure

For those projects including installation of chiller unit, diagnostic procedure for chiller should be provided.

- 8. Maintenance requirement & specification
- 9. Recommended spare list
- 10. As-fitted drawings

The following drawings shall be provided but not limited to schematic diagram, layout plan (A/C unit, and etc.), control diagrams and one complete set of soft copy (AutoCAD v.2021).

SPECIFICATION – PRELIMINARIES

<u>Generally</u>

The preliminary items included hereunder apply to the whole of the Works contained in this Contract and the tender sum shall be deemed to include all costs in connection with such preliminary items, overheads, supervision and other expenses.

1.0 <u>Definitions</u>

a)	Employer	G.T. (Ellen Yeung) College
b)	Architect	Ben Yeung & Associates Ltd
c)	Structural Engineer	Ben Yeung & Associates Ltd
d)	M&E Consultant	Ben Yeung & Associates Ltd
e)	Surveyor	Not Applicable
f)	Quantity Surveyor	Ben Yeung & Associates Ltd
g)	Clerk of Works/ Resident Engineer	Whenever the term "Clerk of Works" and/ or "Resident Engineer" appear(s), they/ it shall be deemed to refer to the person or company so may be appointed as Employer's representative on Site.
h)	Main Contractor/ Builder	The person, persons or firm so named in the Agreement, including its representative who is employed by the Employer to execute and complete the Main Contract works.
i)	Specialist Contractor	The person, persons or firm employed by the Employer for the execution and completion of any particular work
		which is in relation to but not under the Main Contract.
j)	Contractor	Any contractor employed by the Employer for the execution and completion of any portion or portions of the Works, including the Main Contractor and Specialist Contractors.
j) k)	Contractor Government	 which is in relation to but not under the Main Contract. Any contractor employed by the Employer for the execution and completion of any portion or portions of the Works, including the Main Contractor and Specialist Contractors. The Government of the Hong Kong Special Administrative Region.
j) k) I)	Contractor Government Site/Working Area	 which is in relation to but not under the Main Contract. Any contractor employed by the Employer for the execution and completion of any portion or portions of the Works, including the Main Contractor and Specialist Contractors. The Government of the Hong Kong Special Administrative Region. The land and other places on, under, in or through which the Works is to be executed and any other areas designated as storage or work areas for the convenience of the Main Contractor.
j) k) I)	Contractor Government Site/Working Area Provide	 which is in relation to but not under the Main Contract. Any contractor employed by the Employer for the execution and completion of any portion or portions of the Works, including the Main Contractor and Specialist Contractors. The Government of the Hong Kong Special Administrative Region. The land and other places on, under, in or through which the Works is to be executed and any other areas designated as storage or work areas for the convenience of the Main Contractor. Supply and complete installation of such materials, fittings, equipment, etc.

- 1.0 <u>Definitions</u> (Cont'd)
 - o) Calendar Day Shall be calculated in accordance with days of the Calendar including Sundays and other days which are general holidays by virtue of the General Holidays Ordinance (Chapter 149).
 - p) Working Days Shall be calculated in accordance with normal working days for the building industry excluding Saturdays, Sundays and public holidays.
 - q) B.S./B.S.S. British Standard Specification (Latest Edition in Metric Unit) where applicable.
 - r) C.P. British Standard Code of Practice (Latest Edition in Metric Unit) where applicable.
 - s) Specification The specification for this Contract and any further specification furnished to the Main Contractor for the Contract Works to proceed pursuant to any provision of this Contract.
 - t) Making Good This includes all labour and material necessary to bring the disturbed area to the same face, colour, texture, etc., in the same materials as the surrounding Works, and shall include for painting, colouring and/or varnishing any new work to match the surrounding existing works to the entire satisfaction of the Architect and/or the Employer.
 - u) As Described This refers to the materials and workmanship described in the relevant clauses of the Specification.
 - Terms such as "approved by", "to approval", "as v) Approval directed" and the like, refer to approval or directions given by the Architect. The Architect will consider alternative materials and methods that the Main Contractor may propose. No such alternative shall be adopted without the prior approval of the Architect. Approved alternative materials or work will not qualify for additional costs unless such additional costs are sanctioned before approval is given. Under no circumstances shall approval relieve the Main Contractor of his responsibilities as set out in the Conditions of Contract. No approval will be binding until given in writing.
 - w) Manufacturer's The instructions or recommendations printed in writing Instruction/ from the manufacturer, current at the date of tender. Recommendation

1.0 <u>Definitions</u> (Cont'd)

- x) or Approved Terms such as "or approved equivalent", "or equal", or "similar to" and the like, refer to materials of different manufacturer but of equal quality which may substitute the specified proprietary material if prior approval has been obtained, but the rates and prices will not be changed from those submitted for the materials originally specified.
- y) Equivalent Where the standard called for within the Specification is not available, materials conforming with an equivalent recognized Standard will be accepted subject to the approval of the Architect.
- z) Works The improvements to be constructed upon the Site by the Main Contractor, as described in Section 2.

Words importing the singular only also include the plural and vice versa where the context requires.

2.0 <u>Description of the Works</u>

2.1 Generally

The descriptions of the scope of the Works and description of the Works given hereunder must not be considered as being complete.

The Tenderer is deemed to have read other related documents and Specification etc. and in particular to have studied the tender drawings to be fully aware of the full extent of the Works.

2.2 Scope of Work

The Works to be carried out are the minor works at Multi-purpose Rooms on G/F at G.T. (Ellen Yeung) College TKO campus as follows:

The Works shall comprise but not be limited to :

- a) Repartitioning modification at the existing multi-purpose rooms including demolition of walls and construction of new walls;
- b) Supply and installation of all associated building services, including but not limited to lighting & electrical works and fire service installation for Item a above, if applicable.
- c) Supply and installation of built-in fittings and equipment for Item a above, if applicable.
- d) Supply and installation of door & ironmongery for Item a above.
- e) Provisional items, including signage and/ or decorative features, as well as equipment, if applicable.

- f) The scope of the works in this contract consist of providing all materials, labour, equipment and transportation to complete the work as shown on the Drawings and as described in the Specification of the tender documents. All work done shall be in strict accordance with all applicable codes & regulations involved.
- g) The scope of the works in this contract consist of the following:
 - i. Demolition works associated with the Works;
 - ii. All necessary temporary and protection works associated with the Works;
 - All preliminaries items stipulated herein this Specification Preliminaries and elsewhere in the other parts of the Specification and Drawings;
 - iv. All associated reinstatement works, cleaning and making good of the affected areas;
 - v. Provision, maintenance, alteration (as necessary) and subsequent removal after use of all necessary temporary scaffolding, hoarding, access and routes for the public and protection to the existing building;
 - vi. Provision of temporary signage, indications and circulation diagrams for the occupants and visitors during the construction period;
 - vii. All necessary submissions to the Government Departments, Authorities, utility companies and the like;
 - viii. Construction of mock up as required in this Contract;
 - ix. All such other works as may be ordered in accordance with the Conditions of Contract;
 - x. Other works as shown on Drawings and Specification.
- h) The Contractor shall be deemed to have allowed for all costs and profit associated with these works, any inconvenience which may occur and/or any loss or expense caused by the disturbance to the regular progress of the works arising from these requirements.
- i) The Contractor shall be a Registered General Building Contractor (RGBC), which shall carry out the alteration and addition works (A&A), i.e. glass balustrade and door opening on roof, approved by the Building Authority and undertake the duties of RGBC to comply with the current statutory requirements.
- j) The Contractor shall submit the master programme of works for the Architect's approval prior to commencement of works.

2.3 <u>Specification</u>

The specification included in this booklet is the Specification referred to in the conditions of Contract. The Main Contractor shall be deemed to have examined the Specification.

3.0 <u>Conditions of Contract</u>

The Standard "Conditions of Contract" will be the Agreement and Schedule of Conditions of Building Contract for use in Hong Kong Private Edition – Without Quantities, 2006 Edition under the sanction of the Hong Kong Institute of Architects, The Hong Kong Institute of Surveyors and The Society of Builders, Hong Kong together with the amendments to the Conditions of Contract hereinafter described.

4.0 Intent Of Construction Documents

The intention of the documents is to include all labour, materials, equipment and transportation necessary for the proper execution of the true intent and meaning of the works, including items that may or may not be particularly covered by the Specification or drawings, provided the same may be reasonable inferred therefrom. All Contract Documents are complimentary and what is called for by any one shall be binding as if called for by all.

5.0 <u>Insurance</u>

Before commencing work, the Main Contractor is required to take out the following insurance policies in accordance with the terms and Conditions of Contract.

- a) Third Party Insurance
- b) Contractors' All Risk Policy
- c) Worker's Compensation Insurance

Third Party Insurance

In the case of Third Party Liability, notwithstanding that the liability to indemnify the Employer is absolute, a policy limited to the sum of HK\$20,000,000 minimum for any one accident (the expression "accident" meaning any one accident or series of accidents arising out of one event irrespective of the number of claims that may arise therefrom) but unlimited in the aggregate amount for the period of insurance will be acceptable to the Architect.

If the Main Contractor considers the above-mentioned limit of indemnity for any one accident to be inadequate to cover his contractual obligations he is at liberty to take out a policy with an increased limit of indemnity but any additional premium or differential in premium shall be at his own expense.

Insurance of the Works against Fire etc.

In addition to the specified insured sum the Main Contractor shall also arrange specific cover for removal of debris so that in the event of serious loss the Site may be cleared without reducing the amount available for reconstruction. The amount of such cover shall be at the discretion of the Main Contractor but shall not be less than HK\$10M.

6.0 Drawings and Specification

- a) Supplementary detail drawings and instructions will be issued as and when required.
- b) Any discrepancy between the drawings and Specification, and in case of any discrepancy between the measurement by the scale attached to the drawings or site and any dimensions written thereon, the Architect shall decide which shall be followed.
- c) All work shall be carried out in accordance with the directions and to the full satisfaction of the Architect and in accordance with the drawings issued and Specifications and further drawings, details, instructions and explanations as may from time to time be given by the Architect. The Contractor will be furnished two sets of drawings and Specification for his own use which must be returned to the Architect upon completion of the contract.

d) <u>MATERIAL AND EQUIPMENT</u>

All material and equipment as employed under this contract shall be governed by latest edition of the General Specification for Government Building in Hong Kong issued by ASD.

e) WORKMANSHIP AND INSTALLATION

Requirement for the workmanship and installation shall be complied to the latest edition of the General Specification for Government Building in Hong Kong issued by ASD.

f) <u>MATERIAL AND EQUIPMENT</u> (ELECTRICAL SYSTEM)

All material and equipment as employed under this contract shall be governed by General Specification for Electrical Installation in Government Buildings of The Hong Kong Special Administrative Region issued by Building Services Branch, Architectural Services Department (latest edition).

g) WORKMANSHIP AND INSTALLATION (ELECTRICAL SYSTEM)

Requirement for the workmanship and installation shall be complied to the General Specification for Electrical Installation in Government Buildings of The Hong Kong Special Administrative Region, issued by Building Services Branch, Architectural Services Department (latest edition).
7.0 <u>Examination of Site</u>

- a) The Contractor shall examine the Site prior to commencement of works and shall verify the followings :
 - 1. All conditions of existing work at Site.
 - 2. Verify all existing measurements of work at Site.
 - 3. Adjacent area may be affected by the works.
 - 4. Any other parts that will affect the works.
- b) The Architect shall be notified in writing of any inconsistency between the existing conditions of the site and existing conditions shown.
- c) No claims shall be allowed on the ground of ignorance of the existing site conditions.

8.0 <u>Examination of Samples</u>

The Tenderer is required to call at the Architect's office prior to finalize his tender so as to examine selected samples as submitted by the named suppliers. The tenderer shall liaise with such suppliers immediately to establish delivery period and quantities.

9.0 <u>Mock-Up</u>

Contractor is required to make allowance for mock-up/sample area for the specified materials, colour, finishes fixtures and custom-made finishes/fixture and special details as set by the Architect. Architect will determine extent of set-up with prior notice to Contractor, and reasonable time in programme of works shall be allowed for any amendments to be made to the mock-up as per Architect's instruction.

10.0 <u>Shop-Drawing</u>

For plumbing and drainage system, as instructed by the Architect and Engineer and as specified in the construction document, the Contractor is required to submit shop drawings for Architect and Engineer's comment and approval prior to installation.

10.0 <u>Shop-Drawing</u> (Cont'd)

The Contractor shall submit, in triplicate, shop drawings as required for approval prior to fabrication/installation. The Contractor shall verify all filed measurements and conditions. Shop drawings shall indicate all dimensions, detail, connections, etc. They shall check and comment in conformance with the design and compliance with the information given. Approval of such drawing shall not relieve the Contractor from the responsibilities for deviations from the construction documents and the true intent of the works.

11.0 <u>Maintenance and Defects Liability Period</u>

The defective liability period shall be twelve (12) months starting from the date of practical completion of the work. This clause shall supersede any previous clause related to this subject.

If any defects or signs of deterioration occur to the said work within such period, the contractor shall be liable to make good all such defects at his own expenses and to the satisfaction of the Architect and Engineer.

In the event that the captioned site is not to be vacated during construction, the 12 months Defects Liability Period shall commence at times of occupation of the construction works.

12.0 <u>Co-operation With Other Contractor</u>

The Contractor shall co-operate at all times with all the contractors of other trades in order to achieve efficient working on site.

13.0 <u>Attendance at Meeting</u>

The Contractor shall allow for attendance of his qualified representative at all site meetings called at reasonable times by the Architect/Engineer for the purpose of assessing progress on site.

14.0 <u>Materials, Equipment and Employees</u>

- a) Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labour, tools, equipment, water, light, power, telephone, transportation and other facilities necessary for the execution and completion of the works.
- b) Unless otherwise specified, all materials shall be new in good condition and workmanship shall be of superior quality. The Contractor shall if required, furnish satisfactory evidence as to the kind and quality of the materials.
- c) The Contractor shall at all times enforce a strict discipline and good order among his employees and shall not employ in the works any unfit person illegal immigrants or anyone not skilled at the work assigned to him.
- d) A telephone/fax machine (if requested) is to be installed on site for efficient communication with the Architect.

15.0 <u>Samples and Timing</u>

The Contractor shall furnish, for approval, samples of materials and finishes as directed prior to delivery and installation. All materials and installation shall be in conformance with the approved samples. The Contractor shall verify the availability of all the materials specified. If specified materials and articles are not available in time to suit the working schedule, they shall be notified in writing not later than 14 days prior to the installation.

16.0 <u>Deduction for Uncorrected Work</u>

If the Architect and Owner deem it inexpedient to correct work injured or not done in accordance with the contract, and equitable deduction from the Contract Sum shall be made thereof.

17.0 Liquidated Damages

If the Contractor fails to complete the works within the contract time, he shall pay the Owner by the way of liquidated damages at the rate as stated in the Appendix of the Form of Tender. The liquidated Damage applied not only at the end of the total construction period but also at the delay for occupancy at each phase (if any) of the site since this delay should affect the function of the premises.

18.0 Invoices

The Contractor shall produce all invoices, vouchers and receipted accounts to the Architect at time of application of each payment.

19.0 Limit and Period of Retention Money

The limit and period of retention sum shall be as stated in the Appendix to The Form Of tender.

20.0 <u>Safety Precautions</u>

The Contractor shall take all necessary precautions for the safety of employees on the works and shall comply with all applicable safety laws and building codes to prevent accidents or injury to persons, in, about or adjacent to the Site. He shall erect and maintain at all times as required by the conditions and progress of the work, necessary safeguards for the protection of the workman and public. The Contractor shall not hold the Employer or <u>the label</u> for any claim or legal action arising from all work or related work in this contract.

21.0 <u>Separate Contract</u>

The Employer reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and execution of their work and shall properly connect and co-ordinate his work with theirs. The Contractor is to co-ordinate the Schedule, the work of other contract(s) so as not to cause any delay of the progress of the work.

22.0 <u>Marking Out of Site</u>

Prior to commencing any construction work on site the Contractor is required to mark out the whole of the site indicating precisely where all partitions, fixed furniture, loose furniture and equipment is to be located. The marking out should be approved by the Architect prior to commencement of fabrication. Reasonable time in programme should be allowed for any amendments to be made to the inaccurate setting out.

23.0 Variation Orders & Extras

The Contractor shall adhere strictly to the Drawings and Specifications. A change order is required for any change of work. Change Orders involving a change of contract sum shall be signed by the Architect prior to commencement of change. No claims shall be valid unless this procedure is followed.

The Contractor shall allow in their unit rates any wastage that may incur in the execution of works.

24.0 <u>Scaffolding, Plant, etc.</u>

The Contractor shall provide his own mechanical equipment, tools implements, plant and other articles including temporary propping necessary for the execution of his contract work.

25.0 <u>Temporary Electricity and Water Supply</u>

The Contractor is to provide and pay all charges for and connection & for remove temporary electricity supply for all power and light and temporary plumbing or water supply required during the progress of the works.

26.0 <u>The Works</u>

Whenever the term "The Works" is used, it refers to the A&A Works at G.T. (Ellen Yeung) College, 10 Ling Kwong Street, Tiu Keng Leng, TKO.

27.0 <u>Protection of Work and Property</u>

The Contractor shall continuously maintain adequate protection of all his work including repositioned work (e.g. existing sanitary wares and fittings) from damage and shall protect the Client's and building Owner's property from injury for loss arising in connection with the contract. He shall make good such damage, injury or loss, except when same are from causes beyond the control of the Contractor and not through his fault or negligence. He shall adequately protect all adjacent properties as provided by law and as required.

New plywood boards should be used to protect the work area enclosing surfaces and all other existing surface to be retained on and near the site. These boards shall be kept in clean conditions during the contract period with posters of notice of construction works to be posted throughout. Special attention for such safety protection is to be taken at work phases where the site is under operation.

The Main Contractor is to amply protect all finished Works including electrical and sanitary fittings, built-in fixtures, metal work, glass, tiles and other wall and floor finishings, etc., and will be responsible for any damage caused by carelessness and negligence in this respect.

At the Completion of the Works, clean up after all trades and remove all marks, stains, finger prints, debris and other soil or dire from the Site and make good, and clean out all gutters and channels of the Site.

Clear away from the Site all plant, surplus building materials, earth and rubbish and leave the premises clean and fit for occupation to the entire satisfaction of the Architect.

28.0 <u>Defects and Liability</u>

a) The Contractor is responsible for and shall make good all defects occurring within the Defects Liability Period stated in the Conditions of Contract, due to poor workmanship or materials, to the reasonable satisfaction of the Architect.

b) No final or other certificates shall relieve the Contractor from Liability for fraud, or wilful deviation from this Contract. The Contractor shall remain responsible for such fraud or wilful deviation and consequence thereof whether the same be discovered or not prior to the granting of the final certificate.

29.0 Terms of Payment

Amount payable for work carried out minus corresponding portion of retention money	Every 1 calendar month from the Date of Commencement
Amount payable for work carried out minus the first half of retention money	on issue of Substantial Completion Certificate
Remaining half of retention money	on expiry of 12months of Defects Liability Period and issue of Making Good Defects Certificate

30.0 <u>Produce Documents and Evidence</u>

i) <u>Contractor Registration Number & Contractor Nominee</u>

This shall be shown on the Tender Form.

ii) <u>List of Proposed Sub-Contractors</u>

A complete list shall be supplied to the Architect together with all supporting information required by the Architect prior to signing the Contract.

iii) <u>List of Proposed Suppliers</u>

This shall be supplied to the Architect on request together with all supporting information required by the Architect prior to the Contract.

The building services works should be carried out by the appropriate domestic sub-contractors on the current list of Approved Specialist Contractors for Public Works and the names of the proposed sub-contractors should be submitted with the tender.

iv) Evidence of Insurance Policies

Documentary evidence of the existence of a current Worker's Compensation Insurance Policy and all other Insurance Policies as required under the Contract, shall be presented to the Architect prior to the signing of the contract, or prior to commencement of works on site, whichever, date is the earlier.

31.0 Overall Co-ordination Responsibilities of the Main Contractor

- (i) The Main Contractor shall be responsible for the complete co-ordination of the Works including works executed by Nominated Contractors and Specialist Contractors employed directly by the Employer. This responsibility shall include but not be limited to :
 - a) co-ordination of all trade sections or components one with the other for the compatible integration of the works.
 - b) establishment of detailed logical sequence of work or erection schedules.
 - c) preparation of such drawings as may be necessary to ensure that the installation of the building services are properly co-ordinated.
 - d) ensuring that Nominated and Specialist Contractors are allocated their required amount of time to complete their works.
 - e) provision of suitable and sufficient staff to ensure that the co-ordination procedures are followed to enable the expeditious completion of the Works within the time scale of the construction programme.
 - f) carrying out any alteration work and indemnification of the Employer against all costs, charges, expenses and the like resulting from any failure to co-ordinate the Works.
 - g) liaison with Nominated Contractors undertaking installations of air-conditioning, plumbing, electrical wiring and conduiting and specialist installations to ensure that all trunking, ducts, pipes, conduits and related equipment are "built-in" in a logical sequence.

31.0 Overall Co-ordination Responsibilities of the Main Contractor (Cont'd)

- (ii) The Main Contractor is to provide the following services free of charge to the Specialist and Nominated Contractors and to afford them all reasonable facilities for the proper execution of their work including :
 - a) Lock up storage on site or in the building under construction.
 - b) Working space for and clear access to the Nominated and Specialist Contractor's works.
 - c) Use of such plant, ladders, scaffolding or staging as may have been provided or erected by the Main Contractor subject to the prior agreement and at the convenience of the Main Contractor and provided that there is no obligation to retain any such plant, ladders, scaffolding or staging longer than is necessary for the Main Contractor's own use.
 - d) Use of the telephone, latrines and the usual conveniences of a building site.
 - e) Any fencing, hoardings, etc. for site safety as required and incidental to the execution of the Specialist and Nominated Contractors' works.
 - f) Adequate water and electrical supplies at convenient positions throughout the Works under construction and to work and storage areas within the Site for lighting, operation or power tools and testing and commissioning up to and including final acceptance of the installations.
 - g) Protecting and Nominated Specialist Contract works including typhoon protection.
 - h) Cutting or forming chases, holes and openings etc. of sizes required for work carried out by Nominated & Specialist Contractors providing and building in sleeves, supplying cement mortar for fixing brackets, bedding and grouting behind frames, filling around and painting surface wiring exposed to view, painting conduits exposed to view, sealing around all pipes, ducts and cables with approved mastic, making good all work disturbed and all other necessary work of a like nature insofar as such works are associated or integrated with the Main Contractor's own works.
 - i) Such assistance as is necessary including the coordinating on site with and allowing the Nominated and Specialist Contractors of unloading his plant, goods and materials and the use by the Nominated and Specialist Contractors of his hoisting facilities for transportation of the Nominated and Specialist Contractor's plant goods and materials and distribution to various locations.

31.0 Overall Co-ordination Responsibilities of the Main Contractor (Cont'd)

- j) Any making good on completion of work disturbed by the removal of the preceding facilities.
- k) Final cleaning of the Nominated and Specialist Contractor's works in conjunction with the cleaning of his own work prior to handing over the Works to the Employer.

32.0 <u>Removal of Rubbish</u>

The Contractor shall see to it that all rubbish debris, etc. shall be removed daily as it accumulates and the site is to be kept clean and tidy at all times, not with standing that these debris are left over by nominated supplier and sub-contractors associated with the project, during the progress of the contract to the satisfaction of the Architect. When the Employer considers the Contractor fails to keep the site clean and tidy, the Employer may, without further notice, carry out or cause to be carried out all or any part of such cleaning and carting away debris, and the Employer shall be entitled to recover the cost of such work from the Contractor.

33.0 <u>Contractor's Claim of Extras</u>

The Contractor shall submit to the Architect any claim for direct loss and/or additional expenses (giving full and detailed particulars of the amount claimed) to which the Contractor may consider himself entitled or of any extra and additional work contained in Architect's verbal instructions within seven days after the event and no claim for such additional expense or extra work will be considered if submitted later than required herein.

34.0 <u>Verbal Instruction</u>

The Contractor shall carry out verbal instructions received from the Architect. If such an instruction involves a variation to contract and written confirmation has not been received by the Contractor, the latter may himself request confirmation of the instruction by letter to the Architect. The Architect, having received the Contractor's letter, shall either confirm or dissent within seven days.

35.0 <u>House Rules</u>

- (i) The Contractor shall carry out all works in accordance with the rules, regulations and conditions as may be stipulated by the Employer/ building management.
- (ii) The contractor shall comply with any requirements for the latest issued Noise Control Ordinance (Cap. 400) regarding the restriction on noise activities which may affect the execution of the works.
- (iii) It is the Contractor's responsibility to be fully aware of the above requirements and allow for any necessary provisions in their tender sum. In particular, working uniform for labours shall be required in all times.

36.0 <u>Night Time and/or Sunday Work</u>

- (i) Night time and/or Sunday work may be carried out at the discretion of the Contractor, on the condition that he shall obtain prior approval from the Employer/building management in respect of access and security clearance.
- (ii) The contractors are to observe the hours of operation allowed by the estate management regarding noise-generating percussion works.
- (iii) No claim for extension of time and/or costs shall be considered by the Architect if the Contractor is prevented from carrying out night time work.

37.0 <u>Stages of Work</u>

The Contractor shall allow in his tender cost for the Stages of Work. No claim for extension of time and/or costs shall be entertained due to ignorance of this Clause.

38.0 Daily Reports, Photographs and Programme

- (i) The Main Contractor shall prepare daily reports with photographs showing work progress, such report should be in triplicate copies, all photos in colour and to be approved by the Architect at every site coordination meeting and shall also submit the weekly reports.
- (ii) If during the course of the Contract special circumstances should arise, which in the opinion of the Architect warrant or necessitate a revision or departure from the order of procedure as shown in the approved programme, then the Contractor shall accordingly so revise his programme as the Architect may require.

The programme drawn should clearly show the proposed phasing of works on site in order that the programme may be maintained or amended where necessary it is incumbent upon the Contractor to notify the Architect whenever there is the likelihood of a delay supplies or in those of any of his Sub-Contractors.

39.0 <u>Completion</u>

- (i) On completion of the work and before handing over the Works, the floors, glass, fittings, tiling, ironmongery, paintwork, etc, are to be thoroughly washed and/or cleaned down using proper detergents, scrapers scrubbing brushes, etc., all windows, drawers, doors and hardware eased and tested exposed metal work shall be polished as necessary and the premises left clean and fit for occupation.
- (ii) All plant, rubbish, crates, containers, surplus materials, etc. are to be removed and the Works and Site adjacent thereto left clean and tidy. Labelled keys and guarantees shall be handed to the Employer on or before the Date of Practical Completion.

40.0 <u>Security</u>

The Main Contractor shall be responsible for the safety from damage or theft of all materials, plants, machinery and tools and also for all named Domestic Sub-Contractors and Specialist Contractors, fixed and unfixed materials, goods, etc. delivered to Site.

41.0 <u>Temporary Latrines</u>

The workmen or labours employed by the Works are not allowed to use the existing toilets inside the building.

42.0 <u>Workmen living on Site</u>

The Main Contractor will not, under any circumstances, be allowed to have workmen living on site at time throughout the Contract.

43.0 <u>As-fitted Drawings</u>

After the completion and before the acceptance of the installation, the Contractor shall provide and submit 3 sets hard copy and 1 set in CD-Rom copy of "as-fitted" drawings in AutoCAD 2017 or higher version format to the Employer.

44.0 <u>Contingencies</u>

With regard to the provision of a contingency sum as shown on the Schedule of Rates and Summary of Tender, the sum shall be expended in whole or in part as directed by the Architect or wholly deducted from the contract sum, if required. PARTICULAR SPECIFICATION

Introduction

The Particular Specification is to be read in conjunction with the General Specification. All clauses and descriptions in the General Specification are relevant to the Works and are to apply wherever applicable. The Particular Specification is an amplification of the General Specification and refers only to those clauses and items which are at variance with or are not specified in the General Specification. In the event of any doubt or discrepancy, the Particular Specification shall prevail and the Architect's attention shall be drawn to such discrepancy or lack of information as soon as possible in order that he may advise the Contractor of the required Specification.

<u>Definition</u>

Wherever the following terms are used in the General Specification or this Particular Specification, they shall be interpreted as defined hereunder:

- 1. "Supervising Officer" or "Engineer" is the Architect as defined in the Articles of Agreement or his authorized representative on Site.
- 2. "Government" shall mean the Employer G.T. (Ellen Yeung) College.
- 3. "Government Supply" all materials specified in this tender shall be supplied either by the Contractor, Nominated Sub-Contractor, Nominated Suppliers, Selected Domestic Sub-Contractors or Selected Suppliers.
- 4. "Nominated Sub-Contractor" shall also mean Selected Sub-Contractor.

General Responsibility

Proprietary Items required for submission to the Buildings Department for approval are to be of Contractor's full responsibility for compliances with all current regulations and codes based on the Architect's design intent drawing. No additional cost can be claimed due to increase in material size and/or thickness as per the requirement of Buildings Department, Government Authorities, Architect and Structural Consultant. A full set of shop drawings and product specification, including design loadings, material properties and other information is needed for obtaining approval from the Buildings Department of Hong Kong, if required. No additional cost can be claimed due to the preparation and submission of shop drawings and product specification, if required.

Amendments and Additions to General Specification for Building, 2022 Edition, Architectural Services Department

Additional Sections to the General Specification are as follows:

Section 8 – Minor Concrete Work, Blockwork and Concrete Repair Work

Section 13 – Carpentry and Joinery

Section 18 – Finishes - Screed, Render & Tiling Section 18 – Finishes - Vinyl Flooring & Self-levelling Screed

Section 21 - Painting

Section 27 – Suspended Ceiling System

8.1 MINOR CONCRETE WORK AND BLOCKWORK FOR INTERNAL WALL

8.1.1 General

The internal walls comprise minor concrete works and blockwork, which may as indicated include fire resistance requirements to meet statutory requirements.

8.1.2 <u>Scope of Work</u>

The scope of work shall encompass the construction of the internal walls in accordance with the requirements of the contract.

8.1.3 <u>Technical Requirements and Performance</u>

- (a) All internal walls shall be constructed to the soffit of the slabs unless otherwise stated. All walls shall be sealed at the junctions to the slabs as required, including fire stops to be provided as necessary.
- (b) All blockwork shall be of solid blocks.
- (c) Lateral supports shall be provided whenever required by the Architect or Structural Consultant. Notwithstanding this, the Contractor shall comply with the relevant CP with regarding to achieving stability of the walls in compliance with the required slenderness ratio.
- (d) Openings in the walls shall be provided with lintels as indicated on the Drawings. Blockwork shall not be suspended at openings without resting on lintels.
- (e) Lintel supports to concrete structures shall be provided as indicated on the Drawings, and such supports shall be bolted to the structure without compromising the integrity of the structure in terms of damage to concrete cover, or impacting upon the reinforcement.
- (f) All building services, including conduits, trunkings, terminals, etc, shall be embedded within the walls via chases. Such chases shall not be cut into the walls, but shall be formed through the provision of recesses, either with blockwork on edge or cast into concrete walls. No chasing of the walls is permitted.
- (g) All chases shall be packed solid with mortar and provided with EML to receive finishes, so as to achieve integrity of the walls.
- (h) At all areas without false ceiling where the walls abut the structural soffit, EML shall be provided for reinforcement of the finishes to prevent cracking at the junctions.
- (i) Blockwork shall not rest directly on door, glazed screen or other similar opening elements without the provision of lintels.

8.1.4 Workmanship

- (a) At all times, the site shall be kept dry and finished blockwork shall not stand in pooled water.
- (b) Surfaces of the walls must be properly keyed for receiving internal finishes.

8.2 <u>CONCRETE REPAIR WORK</u>

8.2.1 Materials

The materials used for concrete repair shall be as specified below or approved equivalent with a compressive strength of 18 – 21 MPa@ 7 days and 22 – 26MPa@ 28 days and with a non-shrink property:

E-MIX Polymer Modified Mortar

Crack injection sealing material: E-MIX Non-shrink Grout GP

8.2.2 Method Statement

- A Carry out thorough preparation in accordance with the following procedures:
 - a) Saw-cut or cut back the extremities of repair locations to a depth of at least 10mm to avoid feather-edging and to provide a square edge.
 - b) Break out the complete repair area with light mechanical plant or hammer and chisel until all loose or severely cracked concrete is removed and until the remaining concrete appears solidly bonded together or until the reinforcement exposed is only lightly corroded; leave a gap of 10 – 20mm behind the reinforcement.
 - c) Damage to existing reinforcement (especially where it is embedded in existing concrete) and to adjacent elements of the building shall be minimized. Roughen the exposed concrete surfaces where repair materials are to be placed to expose the aggregate and remove any loose materials.
 - d) Fully expose any corroded reinforcing in the repair area. Manually brush and scrape the exposed lengths of reinforcement to remove scale and corrosion deposits, all to the satisfaction of the Architect. Steel should be cleaned to a bright condition paying particular attention to the back of exposed steel bars.
 - e) After breaking out and preparation of reinforcement, brush the reinforcement with a dry brush to remove all loose dust and dirt.
 - f) As soon as possible after cleaning, apply bonding agent to reinforcement.
 - g) In the case of seriously rusted or broken reinforcement bars are found, replace with bars of equivalent type and diameter with adequate lapping tightly tied with steel wire.
 - h) Report to the Architect for an inspection of the preparation work.

B Apply the repair mortar in accordance with the following procedures:

- a) Thoroughly mix the repair mortar in strict accordance with the manufacturer's recommendations.
- b) Thoroughly soak the repair area substrate with cement wash (any excess being removed prior to commencement).
- c) Before the substrate has dried, apply the repair mortar by hand in strict accordance with the manufacturer's recommendations.
- d) Immediately following completion, apply an approved curing agent or water and sprinkle at intervals to ensure a good setting of the mortar and to avoid cracks developing due to shrinkage.
- C Where necessary, provide adequate propping to beams and slabs under repair. The material and method of such propping shall be submitted to the authorised person for approval. The propping shall only be removed after the newly-placed material has acquired adequate strength.
- D Where recasting is required, the concrete for repair shall be of 30D/20 mix, with non-shrink property, for all structural members.
- E Formwork shall be so constructed as to be of sufficient strength and rigidity, and the props to be resting on a safe support.
- F If required, carry out tapping test to the repaired areas and the immediate surrounds.
- 8.2.3 Repair of Loose Plaster / Rendering
 - (a) Carry out tapping test and mark out the areas to be repaired.
 - (b) All loose/ defective plaster or rendering shall be made good with plaster or rendering of the same type.

End of Section

13.1 General

- 13.1.1 The plastic laminate works shall comprise the plastic laminate and the associated works in the application of the laminate and its adhesive, including the associated considerations and impact that the works have in conjunction with the whole of the works comprising the substrate, the entire assembly of which is herein called the System.
- 13.1.2 Plastic laminate shall generally be used to the following areas: Works described under this section include, but are not limited to the provision of all labour, materials, plant, equipment, tools services and all other items necessary to erect and complete in a workmanlike manner all section name work as shown on contract drawings and specifications.
- 13.1.3 The System shall be of a proprietary product supplied by authorized agents of the manufacturer and installed fully in accordance with the manufacturer's recommendations.

13.2 Scope of Work

The scope of work shall encompass the supply and installation of the System in accordance with the requirements of the contract.

13.3 Requirements and Performance

- 13.3.1 Plastic laminate shall comprise a full range of colours normally available from the largest plastic laminate manufacturers. The Contractor's attention is drawn to the Architect's sample boards available for inspection at the time of tender. The selected range of colours, patterns, and finishes or equivalent showing the design intent with regard to aesthetics shall be fulfilled. The selected visual outlook represents the desired effect suitable for the market facility that it is intended for.
- 13.3.2 The Contractor shall take into consideration and warrant compatibility of the materials with the substrate.
- 13.3.3 Prior to installation, the Contractor shall check all actual dimensions on site based on final layout plans and other working details.
- 13.3.4 The Contractor shall furnish all labour and materials, equipment and services necessary for and reasonably incidental to the furnishing and complete installation of the System as shown on the drawings and/or as specified herein.
- 13.3.5 Installation of the System shall be in strict accordance with the manufacturer's specification and recommendation.
- 13.3.6 The finished works shall be smooth, clean and free from damage and defects.
- 13.3.7 Samples of all materials shall be submitted to the Architect for approval before ordering.
- 13.3.8 Unless otherwise specified, all materials shall be of the best quality of the types specified.

13.4. Tender Requirements

Not Applicable.

13.5 Manufacturer's Literature

The Contractor shall submit the Manufacturer's Specification, Technical Data, Performance Characteristics and Installation Instructions which show or describe all items of work including:

- (a) Performance standard,
- (b) Compatibility data with other applications and finishes,
- (c) Test results
- (d) Warranty terms
- (e) All other pertinent information.

13.6 Samples for Approval

- 13.6.1 The Contractor shall submit samples and performance data of materials and articles to be used in the work for the approval of the Architect. Such samples shall include the colours as required by the Architect.
- 13.6.2 The order for bulk supplies of materials and articles shall not be confirmed until formal approval is obtained from the Architect.
- 13.6.3 Irrespective of the materials and articles offered in the tender, all materials and articles for use of the works shall be in full compliance with the Specification unless otherwise agreed or approval by the Architect.

13.7 Execution

- 13.7.1 Workmanship
 - (a) Construct the works strictly in accordance with the manufacturer's stipulations, including observance of the needs for protection and drying.
 - (b) All exposed cut edges of the laminate must be rendered smooth to avoid harm. All saw blades and router bits used for cutting should be carbide tipped. Feed rate should be slow and tool speed should be high. To minimize the development of surface scratches caused by router bits, lubrication of the laminate edge with a wax stick is recommended prior to tooling. All edges of laminate should be filed smooth with file direction towards substrate to help prevent stress cracks and to minimize chipping. When nails or screws must be used, it is advisable to first drill an oversized hole through the laminate to reduce the likelihood of stress cracks.
 - (c) The contractor shall verify all as-built dimensions and conditions on site before commencing the works. The highest workmanship is required and all works shall be performed in an efficient and expedient manner by skilled workman experienced with this type of installation.
 - (d) Laminates shall be supplied and installed in large pieces and as far as practical within an area of 1.2m x 2.4m, shall not have joints.
 - (e) Joints shall be hairline, true and level and shall be kept to a minimum as far as practical.
 - (f) Inside corners of cutouts for electrical outlets, sinks, etc., should have a minimum radius of 1/8" (3 mm) and be filed smooth. This reduces the likelihood of stress cracks.

- 13.7.2 Protection and Cleaning
 - (a) Protect all work from damage during transportation, storage at job site, erection, and subsequent construction activities.
 - (b) Exposed materials shall be wrapped with heavy reinforced, non-staining paper or other approved methods before installation.
 - (c) After installation, provide additional temporary protection as required to protect all work from damage during subsequent construction activities. Soiled works shall be cleaned and touched up where scratched or scuffed with appropriate paint supplied by manufacturer. Scratched materials of more than 5mm are considered to be defective.
 - (d) Any defective or improperly installed components shall be replaced with new materials at the expense of the Contractor.

13.8 Technical Specifications

13.8.1 Refer to contract documents for laminates; Laminate shall be of a quality which is suitable equally for horizontal, vertical and postformed applications. Laminates to be used shall be generally as follows:

Vertical surface for cabinets:-Cheil Industries Jibpool Staron 100% Acrylic Solid Surface 1.23mm

Location	Thickness	Requirement
Cupboards, Cabinets &	1.2mm min.	To BS EN 438 Class HG
Shelves		
Doors	1.2mm min.	To BS EN 438 Class VG

- 13.8.2 All laminates shall not be less than 1.2mm thick.
- 13.8.3 Laminates shall be of the grade incorporating characteristics of impact resistance equivalent to the highest standards available in the industry.
- 13.8.4 Laminate shall be non-flammable to meet statutory requirements and shall have the lowest flame spread and smoke development value available in the industry. Results shall be based on unbonded laminate in determining such qualities and shall meet surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction as follows:
 - a) Flame-Spread Index: 25 or less.
 - b) Smoke-Developed Index: 450 or less.
- 13.8.5 Typical characteristics of the laminate in terms of performance shall conform with the highest available industry standards for light resistance, cleanability, boiling water resistance, high temperature resistance, ball impact resistance, radiant heat resistance, dimensional change both machine and cross directions, similar dimensional change criteria for room temperature, wear resistance, formability, and blister resistance.

- 13.8.6 The laminate shall be manufactured under a high pressure process, in a flat press by combining melamine resin with phenolic-impregnated layers at pressures exceeding the NEMA specification of 750 psi (5.17 MPa) and temperatures approaching 300° F (150° C). The panels are trimmed to size and the backs are sanded to facilitate bonding.
- 13.8.7 Adhesive for fixing laminated plastic sheet shall be synthetic resin adhesive to BS 1204; Parts 1 and 2, Class WBP weather-proof and boil-proof.

End of Section

18.1 WATERPROOFING SCREED

- (a.) The waterproofing cement sand screeds shall be of an integral waterproofing admixture based on a blend of hydrophobic and air entraining surfactants as supplied by the manufacturers and used strictly in accordance with the manufacturer's instructions
- (b.) The waterproofing admixtures shall be chloride free to B.S. 5075 and suitable for use in the production of cement based waterproofing screed as described in clause 4.1.7 of BS 8102: "Code of Practice for Protection of structure against water from the ground".
- (c.) The substrate must be rigid and sound. For concrete surfaces, the honeycombs or loose particles shall be properly remedied / removed prior to the application of screed. Remedial measures shall be submitted for the Architect's review without objection. Substrate with dirt, oil, grease, loose particles, dust, paint and efflorescence etc, shall be cleaned up. All undesirable materials shall be removed before application of screed.
- (d.) At the time of laying floor screed, adequate movement joints to full depth of the screed shall be formed. The movement joints shall be sealed up with sealant of which Contractor shall submit for the Architect's review without objection.

Movement joints shall also be provided where tiling works abuts restraining surfaces, over construction joints, control joints or movement joints in the substrate structure. GMS expanded lathing shall be fixed over cold joints before rendering.

- (e.) The concrete surfaces which are to receive waterproofing screed shall be suitably roughened to provide a mechanical key. Laitance shall be removed from fresh concrete by using stiff brushes or other methods agreed by the Architect.
- (f.) The surfaces shall be cleaned to remove dirt, dust, oil and other deleterious material; the surfaces shall be dampened to avoid excessive suction of water from the applied render during application
- (g.) Waterproofing screeds shall be mixed in accordance with the manufacturer's specifications and recommendations and shall be used within the specified time after mixing. Unless otherwise permitted by the Architect, the materials shall be mixed by mechanical methods until all components are evenly distributed.
- (h.) Waterproofed floor screeds shall be laid between timber battens and in bays not exceeding 15m² the length of each bay shall not exceed 11/2 times the width of the bay and the top surface of the batten shall be set to the required level. Screeds shall be compacted to a uniform density throughout.
- (i.) A minimum of two coats of screed shall be applied. Initial coats shall be lightly scratched before further coats are applied to improve mechanical bonds. Care shall be taken to ensure that overlapping joints are used at wall to floor and wall to wall joints.
- (j.) The screeds must be cured immediately after finishing in accordance with good concrete practice. Water spray, wet hessian or a spray applied curing membrane such as Concure WB shall be used

- (k.) Screeds shall be completed with one of the following surface finishes as stated in the Contract:
 - a smooth un-textured finish using a steel trowel or power float
 - even textured finish using a wood float, or
 - a slightly roughened textured finish using a stiff brush

18.2 WATERPROOFING RENDER

- (a.) The cement sand mortar renderings shall be waterproofed with an integral waterproofing admixture based on a blend of hydrophobic and air entraining surfactants as supplied by the manufacturers and used strictly in accordance with the manufacturer s instructions
- (b.) The waterproofing admixtures shall be chloride free to B.S. 5075 and suitable for use in the production of cement based waterproof renders as described in clause 4.1.7 of BS 8102: "Code of Practice for Protection of structure against water from the ground."
- (c.) The substrate must be rigid and sound. For concrete surfaces, the honeycombs or loose particles shall be properly remedied / removed prior to the application of rendering. Remedial measures shall be submitted for the Architect's review without objection. Substrate with dirt, oil, grease, loose particles, dust, paint and efflorescence etc, shall be cleaned up. All undesirable materials shall be removed before apply spatter dash or rendering, and spatter dash shall be applied onto the substrate within 24 hours after striking off of formwork. The Contractor shall submit for the Architect's review without objection a medial works proposal when spatter dash is not applied within this period of time.
- (d.) At the time of rendering, adequate movement joints to full depth of the rendering shall be formed. The movement joints shall be sealed up with sealant of which Contractor shall submit for the Architect's review without objection.

Movement joints shall be provided between panels at 3600 mm intervals horizontally and 2400 mm intervals vertically. Movement joints shall also be provided where tiling works abuts restraining surfaces, over construction joints, control joints or movement joints in the substrate structure. GMS expanded lathing shall be fixed over cold joints before rendering.

- (e.) The surfaces shall be cleaned to remove dirt, dust, oil and other deleterious material; the surfaces shall be dampened to avoid excessive suction of water from the applied render during application
- (f.) Waterproofed renders shall be mixed in accordance with the manufacturer's specifications and recommendations and shall be used within the specified time after mixing. Unless otherwise permitted by the Architect, the materials shall be mixed by mechanical methods until all components are evenly distributed.
- (g.) Undercoat shall be at least 10mm thick; the surface shall be lightly scratched to form a key for finishing coat, overall thickness shall not exceed 20 mm.

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(h.) Sufficient time for drying out and initial shrinkage of concrete substrate shall be allowed for ensuring good bonding of rendering. A minimum six weeks shall be allowed for this purpose. If an intermediate substrate, e.g. an additional layer of rendering, is required, each layer shall be given 7 days or according to the manufacturer's recommendation to permit drying and shrinkage to take place before the subsequent coat is applied, while the final coat shall be cured and left dry for at least 2 weeks.

18.3 <u>TILE</u>

18.3.1 General

Homogeneous tile for both floor and wall on 4/F, specified for this project shall be of $600 \times 300 \times 10$ mm and $300 \times 300 \times 10$ mm, of Chinese origin.

18.3.2 <u>Requirements and Performance</u>

The quality tests for ceramic tiles specified for this project shall be as follows:

Specification	Standard	Minimum Requirement	Typical Test Values
Length/ Width	10545-2 (BS6431:Part10/EN98)	± 0.75%	± 0.5%
Thickness	10545-2 (BS6431:Part10/EN98)	± 5%	± 2.5%
Straightness of side	10545-2 (BS6431:Part10/EN98)	± 0.5%	± 0.3%
Rectangularity	10545-2 (BS6431:Part10/EN98)	± 0.6%	± 0.5%
Surface flatness	10545-2 (BS6431:Part10/EN98)	± 0.5%	± 0.35%
Water Absorption	10545-3 (BS6431:Part11/EN99)	≦ 0.5%	(0.1%
Modulus of Rupture	10545-4 (BS6431:Part12/EN100)	\geq 35N/mm ²	› 55N/mm²
Abrasion Resistance	10545-6 (BS6431:Part14/EN102)	≦ 175mm ³	95mm³
Linear Thermal Expansion	10545-8 (BS6431:Part15/EN103)	Max 9 x 10-6 K-1	3.5 x 10-6 K-1
Thermal Shock	10545-9 (BS6431:Part16/EN104)	Pass	Pass
Forst Resistance	10545-12 (BS6431:Part22/EN202)	Resistant	Resistant
Chemical Resistance	10545-13 (BS6431:Part19/EN122)	Class C	Class A-B (better)
Stain Resistance	10545-14 (BS6431:Part19/EN122)	Min Class 3	Class 3-5 (better)
Fire Rating			Class 0 Non- Combustibles
UV Color Resistance			Unaffected by light
Weight/m2			19.20kg

Section 18 – Finishes - Screed, Render, Tile, Tile Adhesive & Tile Grout 18.3.3 <u>Submission Requirement</u>

Manufacturer's Literature

The contractor shall submit the manufacturer's specification, technical data, and instruction instructions which show or describe all items of work including:

- (a.) Performance standard;
- (b.) Specifications;
- (c.) Test reports / certificates;
- (d.) All other pertinent information.

Shop Drawings

- (a.) The Contractor shall prepare drawings, details and elevations where applicable for the Architect's review without objection. Floor pattern plan and elevations shall be drawn at 1:10 scale with reference to the gridline and structure. Detail drawings shall be at 1:2 scale.
- (b.) Show drawings shall show details at all floor tile penetrations, abutments, plinths, wall to floor transitions, drain and outlets, internal and exterior corners, and floor movement and control joints installation and details.

Samples

- (a.) The Contractor shall submit samples of each type of tiles with relevant test reports / certificates for the Architect's review without objection.
- (b.) The order for bulk supplies of materials and articles shall not be confirmed until confirmation of no objection by the Architect.

Mock-Up

A mock -up of no less than $1 \times 1 \text{ m}^2$ of each type of tiles shall be supplied and installed on site after confirmation of no objection by the Architect on the material and shop drawings. The mock-up shall include the followings:

- (a.) Waterproofing cement sand render;
- (b.) Waterproofing cement sand screed;
- (c.) Waterproofing layer;
- (d.) Tiles at the confirmed location;
- (e.) Waterproofing grout of confirmed colour.

The endorsed mock-ups shall be used as control standard for quality of material. Colour and workmanship.

Product Handling

- (a.) Tile cartons shall be grade-sealed by manufacturer in accordance with ANSI A137.1. Grade-seals shall be unbroken at the time delivered to site.
- (b.) Labels on manufactured mortars and grouts certifying compliance with reference standards.

Protection Conditions

Protect adjacent work surfaces during tile work. Close rooms or spaces to traffic of all types until mortar and grout have set.

Furnish additional tiles which installed at this project for future replacement and maintenance use, in sealed, unopened boxes. Supply a minimum of 5% of each size, colour, texture, and type of tiles or paver installed.

18.4 <u>TILE ADHESIVE</u>

Maintenance Materials

- (a.) The tile adhesive shall conform to EN12004 standard.
- (b.) The tile adhesive shall be applied to a uniform thickness of 1–15mm
- (d.) The tile adhesive shall be tested in accordance with EN 12002:2002 and have the following properties:

Early Tensile Adhesion Strength after 24hr r.t. (EN 1348)	≥ 1.0 N/mm ²
Tensile Adhesion Strength after 28 day r.t. (EN 1348)	≥ 2.5 N/mm ²
Tensile Adhesion Strength after water immersion (EN 1348)	≥ 1.3 N/mm ²
Tensile Adhesion Strength after heat ageing (EN 1348)	≥ 2.5 N/mm ²
Tensile Adhesion Strength after freeze-thaw cycles (EN 1348)	≥ 1.2 N/mm ²
Open Time after 10min. (EN 1346)	≥ 2.2 N/mm ²
Open Time after 20min. (EN 1346)	≥ 2.0 N/mm ²
Extended Open Time after 30min. (EN 1346)	≥ 1.5 N/mm ²
Slip (EN 1308)	≤ 0.5 mm
Transverse deformation (EN 12002)	≥ 5.0 mm (class S2)

- (e.) The tile adhesive can be applied directly on concrete, cement screeds, and cement or lime mortar. Special attention must be given to new construction prior to commencing tiling. Tiles should not be placed on concrete or block work until all shrinkage movement has taken place.
- (f.) The tile adhesive should be spread on the substrate to a uniform thickness of 1-15mm, and then combed horizontally.
- (g.) Place tiles firmly into adhesive bed ensuring good contact with a twisting motion. Only apply to areas which can be tiled in the adhesive's open wet time. (up to 1 sqm at a time.)
- (h.) It is recommended that when fixing ceramic tiles, a minimum spacing of 2mm be left around each tile.
- (i.) Remove excessive adhesive with a damp cloth before material has set. Joint grouting with tile grout may be commenced 24 hours after tiles have been laid.

18.5 <u>TILE GROUT</u>

18.5.1 For Internal Dry Areas

Tile grout shall be of waterproofing type with the following properties:

<u>Property</u>	Test Method	Typical Valve
Compressive Strength	EN 12808-3(EN13888)	24-30 N/mm ²
Flexural Strength	EN 12808-3(EN13888)	6-8 N/mm ²
Water Absorption	EN 12808-5(EN13888)	< 1g after 30 min. < 2g after 240 min.
Working Time at 23 °C and 50% R.H.	-	40 minutes
Rainproof Time at 23 °C and 50% r.H.	-	4 hours
Resistance to Mould	BS 5980: 1980 Appendix B	No mould growth
Shrinkage	EN 12808-4 (EN13888)	< 1.5mm / m

Apply waterproofing grout to the spaces between the tiles using a sponge or a small piece of soft cloth. Work the mixture into the joints and around the edges.

Remove surplus material from the face of the tiles with a dry cloth and run the tip with a suitable rounded tool along the grout to level it off and form a profile.

When the grout is dry, clean the tiles with a damp sponge to remove any excess material. Remove uncured grout from textured tiles prior to setting.

18.5.2 For Internal Wet Areas

- (a.) Be resistant to acids, lyes, grease and oils, salts, solvents and to provide longer term resistance to aggressive cleaning method e.g. steam jet cleaning.
- (b.) Minimum tensile strength of 22 N/mm² at 7 days according to ANSI 118.3-1999.
- (c.) Minimum bond strength at 14 days and after thermal shock of 12 N/mm² according to ANSI 118.3-1999.
- (d.) Water cleanability at 95 minutes: cleanable according to ANSI 118.3-1999; No change in shape (Non-sag) in 10mm vertical joints according to ANSI 118.3-1999.
- (e.) Minimum shear adhesion strength of 2 N/mm², even under thermal shock according to EN 12003.
- (f.) Minimum flexural strength of 30 N/mm² according to EN 12808-3.

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- (g.) Minimum compressive strength of 70 N/mm² at 7 days according to ANSI 118.3-1999.
- (h.) Maximum shrinkage of 0.06% according to ANSI 118.3-1999.
- (i.) Maximum water absorption after 240 minutes of 0.1g, according to EN 12808-5.
- (j.) Maximum abrasion resistance of 250mm³ according to EN 12808-2 (high wear resistance) that can be resistant to rolling and grinding loads, insensitive to cleaning by steam jet.
- (k.) Inhibit the passage of water vapour to avoid the moisture absorption and to protect moisture-sensitive tiles (e.g. resin bonded tiles) and substrates from moisture and water.
- (1.) Be applied up to an adhesive thickness / a grout joint width of at least 15mm, with minimum 2mm.
- (m.) Be tested in accordance with EN 13888 and ISO 13007-3 and has been classified as 'RG' (Reaction resin grout).
- (n.) Be suitable for both tile adhesive and tile grout purpose.
- (o.) Be water impermeable and can produce smooth joint surfaces (low in pores) for easy cleaning.
- (p.) Initial and Service Strength Setting Time according to ASTM C308:2000 Initial Setting Time : Not more than 4.5 hours.
- (q.) Service Strength Setting Time: Not more than 2 days can achieve 22 N/mm².

18.6 VINYL FLOORING & SELF-LEVELLING SCREED

18.6.1 <u>General</u>

- (a) The vinyl flooring system comprises the flooring finish of both the vinyl sheets inclusive of all manufacturer's components forming the whole of the System, to be applied to the floors and to the stairs, of colours to be approval of the Architect, and shall also include the preparation of the base of the surfaces, incorporating the self-levelling screed as well, necessary for the application. The Contractor is deemed to have included for any of the colours in the standard range of the products for the works.
- (b) The vinyl flooring system shall be of a proprietary product supplied and installed by authorized agents of the manufacturer.

18.6.2 <u>Scope of Work</u>

- (a) The scope of work shall encompass the supply and installation of the flooring system in accordance with the requirements of the contract.
- (b) The Contractor shall prepare the detailed design of the installation for the Architect's approval.

18.6.3 <u>Requirements and Performance</u>

- (a) The flooring system shall include all the works incorporating all necessary components, the adhesive and the preparation of the screed including the application of the leveling screed, necessary for the works.
- (b) The Contractor shall make provision in the detailed design for all additional customized components and elements to suit the actual requirements on site, in particular for application of the flooring to the stairs.
- (c) The Contractor shall include for all finishing of the materials at junctions to fittings, including cupboards, plinths, climbing frames, shutters, joinery, tactile tiles, etc.
- (d) Prior to installation, the Contractor shall check all actual dimensions on site based on final layout plans and other working details.
- (e) The Contractor shall also be responsible for:-
 - (i) Shop drawings;
 - (ii) Schedule and monitoring of the works;
 - (iii) Samples and mock-up;
 - (iv) Co-ordination with works of the trade;
 - (v) Protection;
 - (vi) Hoisting and temporary site work.
- (f) The Contractor shall furnish all labour and materials, equipment and services necessary for and reasonably incidental to the furnishing and complete installation of the system as shown on the drawings and/or as specified herein.
- (g) Installation of all works shall be in strict accordance with the manufacturer's specification and recommendation.

- (h) The finished works shall be smooth, clean and free from damage and defects.
- (i) Samples, colour and finish of all materials shall be submitted to the Architect for approval before ordering.
- (j) Unless otherwise specified, all materials shall be of the best quality of the types specified.
- (k) The Contractor's attention is drawn to the need for complete sealing of all joints to prevent moisture ingress and the design of the system shall fully demonstrate and achieve this requirement.
- (I) In particular the Contractor shall note the requirement for tactile tiles to be applied inclusive within the System, and full coordination of the application, alignment of the tile joints, the levelness, and the sealing of the joints must be achieved to fulfill the satisfactory completion of the works.
- (m) The Contractor shall be deemed to have fully allowed for a selection of colours of flooring as required by the Architect, forming patterns within a single area of flooring, or having different colours of flooring in different areas. All joints where welded shall be of matching colours as approved by the Architect.
- (n) The Contractor shall note in particular the need for achieving a high quality substrate for receiving the vinyl flooring. The substrate shall be properly prepared strictly in accordance with the manufacturer's stipulations including the application of the self-levelling screed to all areas where the vinyl flooring is required.
- (o) The Contractor shall also note that for the Old Wing, waterproofing of the substrate to all areas of finishes to the existing slabs/areas has been specified, and prior to the laying of the vinyl tiles, the application of the waterproofing followed by the self-levelling screed must be satisfactorily completed and inspected to the approval of the Architect.

18.6.4 <u>Manufacturer's Literature</u>

The Contractor shall submit the Manufacturer's Specification, Technical Data, Performance Characteristics and Installation Instructions which show or describe all items of work including:-

- (a) Performance standard,
- (b) Fire flammability tests certificate

18.6.5 <u>Shop Drawings</u>

(a) The Contractor shall submit shop drawings for the Architect's approval, such approval of which shall include approval of the samples, and approval of the mock-up, prior to the ordering and fabrication.

(b) The shop drawings shall show:-

- (i) The floor plans showing the pattern of floor tiles, joints, upstands and works in relation to other fittings, mechanical and electrical system, and other related works,
- (ii) Arrangement of components,
- (iii) Sequence and details of fabrication, assembly and erection,
- (iv) Full size details,
- (v) Dimension and thickness,
- (vi) Materials and finishes,
- (vii) Location and spacing of joints and welding rods
- (viii) Connection details showing relationship with adjoining wall finishes
- (ix) All other pertinent information.
- (c) Review of any data, approval of shop drawing shall not mitigate the Contractor's responsibility for the performance of the works nor relieve the Contractor of his responsibility to verify for himself that the work conforms to the Contract Documents.
- (d) When the shop drawings are approved, one soft copy (1), four (4) printed copies and one (1) reproducible print for each of the final approved shop drawings shall be submitted for the Architect's use.
- (e) Should the Contractor consider it is necessary to fabricate or order any item before approval in order to meet completion date, it is entirely at his own risk and no compensation in time or cost will be granted if the material and/or workmanship is eventually not acceptable to the Architect.

18.6.7 <u>Samples for Approval</u>

- (a) The Contractor shall submit samples and performance data of materials and articles to be used in the work for the approval of the Architect.
- (b) The order for bulk supplies of materials and articles shall not be confirmed until formal approval is obtained from the Architect.
- (c) Irrespective of the materials and articles offered in the tender, all materials and articles for use of the works shall be in full compliance with the Specification unless otherwise agreed or approved by the Architect.

18.6.8 <u>Mock-up Samples</u>

After the approval of shop drawings, the Contractor shall fabricate, deliver to and install on site, sample mock-ups of the systems for the Architect to review on construction and design details. The mock-up shall be prepared for one room. If acceptable to the Architect this may become part of permanent works, and the Contractor is deemed to have fully allowed for this in his tender. The location of the mock-ups shall be determined by the Architect.

18.6.9 <u>Execution</u>

Workmanship

- (a) The subfloor must be properly prepared in strict compliance with the manufacturer's stipulations to present a fairly porous, dry, smooth surface that is free of cracks, abscesses and separation joints.
- (b) Prepare the subfloor with a suitable primer. At floors where rising moisture may be expected, apply an appropriate epoxy primer to the Architect's approval, strictly in accordance with the manufacturer's recommendations.
- (c) Apply the flooring in accordance with the manufacture's recommendations. Ensure that all tiles are properly set out and that all cutting is done at the perimeter. Apply welding rods as necessary and carry out welding in full compliance with the manufacturer's recommendations.
- (d) The contractor shall verify all as-built dimensions and conditions on site before commencing the works. The highest workmanship is required and all works shall be performed in an efficient and expedient manner by skilled workman experienced with the type of installation.
- (e) Flooring joints shall be constructed square and true to plane, both in themselves and in relationship with each other where installed in a continuous plane. All components and materials shall be carefully handled at work and on site, both during delivery or handling. Any damaged or defective materials will be rejected.

Installation

- (a) Install all work square, plumb, straight, to line accurately fitted and located, with flush tight hairline joints if practicable (except as indicated otherwise where joints are to be welded).
- (b) It is the responsibility of the Contractor that shop fabricated items shall properly fit the site conditions. n case where the shop fabricated items do not fit the site conditions, the items shall be returned for correction at the Contractor's own expense.

Tolerance

- (a) All work shall be plumb, square, level, and correctly aligned.
- (b) All joints shall align on dead center. No deviation shall be acceptable.

Protection and Cleaning

- (a) Protect all work from damage during transportation, storage at job site, erection, and subsequent construction activities.
- (b) Exposed materials tiles shall be wrapped with heavy reinforced, non-staining paper or other approved methods before installation.

- (c) After installation, provide additional temporary protection as required to protect all work from damage during subsequent construction activities. Soiled works shall be cleaned and touched up where scratched or scuffed with appropriate sealant or wax supplied by manufacturer. Scratched materials of more than 5mm are considered to be defective.
- (d) Any defective or improperly installed components shall be replaced with new materials at the expense of the Contractor.

18.6.10 <u>Technical Specification</u>

Self-Levelling Screed

- (a) Full surface leveling of the subfloor self-levelling screed shall be applied. Such proprietary leveling screed shall be applied to achieve a smooth flat surface to receive the vinyl flooring. The leveling screed shall be subject to the Architect's approval, and shall be of a material that is compatible with the vinyl flooring, forming the whole of the flooring system. The application of the leveling screed shall be strictly in accordance with the manufacturer's stipulations.
- (b) Self-Levelling floor screed shall be applied on top of the cementitious waterproofing coating system, to the primed surfaces or directly to the prepared screed. The self-levelling floor screed shall comply with the properties as described below.
- (c) All floor areas so designated shall be applied with a water vapour permeable, self-leveling polymer modified cementitious screed at 10mm thickness.
- (d) The self-levelling screed shall have the following properties when tested in accordance with the following criteria: -

Properties	Test Methods	Typical Values
Compressive strength at 1 day	B.S.6319: Part 2	$\geq 15 \text{N/mm}^2$
	(40mm cubes cured at 20 ⁰ C 65% R.H)	
Compressive strength at 28 day	B.S.6319: Part 2	\geq 30N/mm ²
	(40mm cubes cured at 20 ⁰ C 65% R.H)	
BRE impact Resistance at 28 days	B.S.8204: Part 1: 1987	Category A
		(Highest rating)
Soundness of screed at 28 days	B.S.8204: Part 1: 1987	\leq 0.8mm depth of
		indentation
Flexural Strength	B.S.6319: Part 3: 1983	≥ 7.7N/mm2
	(Cured at 27oC 55% R.H)	
Flow	BS890 Cone	265 to 275mm
Flow value	BS 890: 1972	≥ 277%
Volume change of screed	ASTM C157-93	< 0.049% @ 28 days

(e) The self-levelling screed should be able to allow foot traffic in 4 - 6 hours in 20 to 30 degree C. It should also allow overlay in 24 hours.

- (f) The self-levelling screed shall be applied onto a clean sound and well-prepared concrete substrate, which is free from loose material, oil, grease, paint and other contaminants. Excess laitance can be removed by light scabbling or blasting followed by washing and vacuuming to remove dust debris.
- (g) The prepared concrete substrate shall have a minimum compressive strength of 20 N/mm 2 .
- (h) The self-levelling screed should be applied at 10mm thickness.
- (i) New concrete should be at least 21 days old and the relative humidity of the concrete substrate must not be greater than 80% at the time of installation which shall be determined using a Vaisalla Thermohygrometer.
- (j) A priming system shall be applied to the prepared substrate diluted at a ratio of 1 part primer to 5 parts of water by volume with clean potable water. The primer should be well brushed out avoiding ponding and allowed to dry. The surface shall then reprime at a ratio of 1 part primer to 3 parts of water by volume and allowed to dry.
- (k) Once the primer has become 'tacky' and film formation can be seen on the surface the self-levelling screed can be applied.
- (I) Concrete slabs to which the self-levelling screed is to be applied must have a surface temperature of at least $+5^{\circ}$ C with air temperature maintained at $+10^{\circ}$ C or more, during application.
- (m) The self-levelling screed should be installed by pump or equipment as approved by the manufacturer.
- (n) Pour the mixed material on to the dry primed surface, spread with trowel and allow to level. Roll surface with a spiked roller to aid air release and leveling properties.
- (o) Curing is generally not required but it is highly essential in harsh curing conditions such as high ambient temperatures, direct sunlight, drying winds etc. Under such conditions freshly hardened surfaces should be covered completely with a polythene sheet for 2 days.

Vinyl Flooring

The vinyl flooring shall be to the following performance standards: -

- (i) Flexibility EN 435 procedure A fulfilled
- (ii) Hardness ISO 7619 ≧90 Shore A
- (iii) Residual Indentation EN433 0.05mm
- (iv) Abrasion resistance at 5N load ISO 4649, procedure A ≦250mm³
- (v) Colour fastness to artificial light EN 20 105-B02 procedure 3, test condition 6.1a grey scale ≥ level 3 acc. to EN 20 105-A 02
- (vi) Toxicity of fire gases DIN 53 436 carbonization gases are non-toxic
- (vii) Anti-slip properties DIN 51 130; BS 7976 TRRL Pendulum
- (viii) Effect of chemicals EN 423
- (ix) Effect of a castor chair EN 425 suitable for castor wheels type W
- (x) EN ISO 14001 : 2004 ; fulfilled
- (xi) The U.S. Green Building Council Certificate of Membership
- (xii) BRE Certification of Environmental Profiles Annual Verification ENP 349
- (xiii) BRE Grade 'A' rating from the "Green guide to specification".
- (xiv) SGS TRGS 552 mentioned N-Nitrosamines, which are classified as carcinogenic, volatile and non-volatile.
- (xv) Cigarette Burn Resistance EN 1399 fulfilled
- (a) Vinyl flooring specified at 2mm thick shall be in roll size 1.22m x 12-15m x 2mm thick. It shall have a minimum of 20 different colours for selection.
- (b) Vinyl flooring sheet specified shall be in mat-silk surface with harmonic granular design, extremely UV-resistant, and shall be highly resistant to contamination. It shall have a minimum of 16 different colours for selection.
- (c) Vinyl sheets shall comprehensively include matching coved skirting component pieces as part of the standard range of products within the System.
- (d) Joints shall be provided with matching coloured welding vinyl rods at the joints which shall be welded to form a homogeneous floor. Such welded joints shall also be provided at junctions to the skirting.

18.6.11 <u>Maintenance Manuals</u>

The Contractor shall submit the Maintenance Manual for the Works showing the information described herein the following where applicable:

- (a) required maintenance regime comprising periodic cleaning, servicing, checking and inspection,
- (b) trouble-shooting checklists,
- (c) list of envisaged faults and damages, together with recommendations for repairs covering materials, parts, methods, protection and commissioning,
- (d) authorized agents or specialist contractors and their contact information

18.6.12 Specialist Contractor

Authorized agents of the manufacturer shall carry out the works as the Specialist Contractor, thoroughly experienced with the installation of the named proprietary system or equivalent, where the works comprising flooring of a minimum of 5,000sqm had been satisfactorily completed for at least 10 years, and shall be approved by the Architect.

18.6.13 <u>Warranty</u>

The Contractor shall procure from the manufacturer jointly with the Specialist Contractor, a joint warranty in accordance with the PS, of the System for a period of 10 years commencing on the date of the Certificate of Completion of the contract as certified by the Architect.

18.6.14 <u>Spares</u>

Provide 3% spare vinyl flooring in the different colours as required by the Contact and deliver to store room or store rooms on the Site or other areas within the territory of HKSAR as directed by the Architect.

21.1 GENERAL

- (a) Primers, undercoats and finishing coats shall be strictly in accordance with the manufacturer's recommendations, and shall be appropriate for use with each other, on the surfaces specified, and within the environmental conditions found in Hong Kong, in order to produce a first class finish. Should the paint systems specified below not comply fully with this condition, the Contractor shall draw attention to this in his tender and submit alternative proposals which will satisfy this condition.
- (b) Prior to commencing painting installation, Contractor shall submit to the architect sample boards of size 1m by 1m showing the whole painting system from primer to final coat. Minimum 50mm wide strip of each succeeding layer shall be shown.
- (c) The painting systems proposed for this project relating to certain Wall and Wall Coating Codes are as follows (or equal and approved) Paint supplier ICI Swire Paints Limited):

21.2 SCOPE OF WORK

The scope of work shall encompass the supply and installation of the System in accordance with the requirements of the contract.

21.3 PERFORMANCE

- (a) The Contractor shall furnish all labour and materials, equipment and services necessary for and reasonably incidental to the furnishing and complete installation of the System as specified herein.
- (b) Installation of the System shall be in strict accordance with the manufacturer's specification and recommendation.
- (c) The finished works shall be smooth, clean and free from damage and defects.
- (d) Samples and colour of all materials shall be submitted to the Architect for approval before ordering.

21.4 MANUFACTURER'S LITERATURE

The Contractor shall submit the Manufacturer's Specification, Technical Data, Performance Characteristics and Application Instructions which show or describe all items of work including:-

- (a) Performance standard;
- (b) Compatibility data with other applications and finishes;
- (c) Test results;
- (d) Application surface preparation; and
- (e) All other pertinent information.
21.5 APPLICATION PROCEDURES

- (a) The Contractor shall submit method statement to demonstrate the application procedures to new and existing walls and ceilings for the Architect's approval, such approval of which shall include approval of the samples, prior to the ordering and fabrication.
- (b) Review of any data, approval of method statement shall not mitigate the Contractor's responsibility for the performance of the works nor relieve the Contractor of his responsibility to verify for himself that the work conforms to the Contract Documents.
- (c) Should the Contractor consider it is necessary to fabricate or order any material before approval in order to meet completion date, it is entirely at his own risk and no compensation in time or cost will be granted if the material and/or workmanship is eventually not acceptable to the Architect.

21.6 SAMPLES FOR APPROVAL

- (a) Should the Contractor consider it is necessary to fabricate or order any material before approval in order to meet completion date, it is entirely at his own risk and no compensation in time or cost will be granted if the material and/or workmanship is eventually not acceptable to the Architect.
- (b) The order for bulk supplies of materials shall not be confirmed until formal approval is obtained from the Architect.
- (c) Irrespective of the materials and articles offered in the tender, all materials and articles for use of the works shall be in full compliance with the Specification unless otherwise agreed or approved by the Architect.

21.7 WORKMANSHIP AND INSTALLATION

- (a) Construct the works strictly in accordance with the manufacturer's stipulations.
- (b) The contractor shall verify all as-built dimensions and conditions on site before commencing the works. The highest workmanship is required and all works shall be performed in an efficient and expedient manner by skilled operatives experienced with the type of application.
- (c) The substrate shall be cleaned and well prepared, according to General Specification or manufacturer's recommendation of the specific paint, whichever is more stringent.

21.8 TECHNICAL SPECIFICATION

Substrate: Exterior Concrete/Plaster Wall & Feature

Apply 1 coat waterborne acrylic sealer and 2 coats matt finishing of water based modified polyurethane paint with the following specification:-

Test Items	Specifications
VOCs content	The VOCs content level is less than 150 g/L; Test method: EPA
	method 24
Low temperature	No deterioration of paint ; Test method: JIS K5400 5.1
stability	
Workability	No impediment for brushing ; Test method: JIS K5400 6.1
Viscosity	Min: 75KU, Max: 95KU; Test method: ASTM D562-81
Opacity	Min: 90%; Test method: BS 3900: D6: 1982
Drying time – 20ºC drying	Max: 2 hour; Test method: BS 3900: C3: 1990
Fineness of Grid	Max: 40um; Test method: BS3900: C6: 2000
Gloss (at 60° specular reflection)	>80; Test method: BS3900: D5: 1997
Water resistance	No change in the pain film after 96hours immersion in water; Test method: JIS K5400 8.19
Salt Water resistance	No damage observed on the paint film after immersion in 3% sodium chloride solution for 96 hours.; Test method: JIS K5400 8.23
Alkali resistance	Immersion in alkali for 168 hours, gloss retention ratio is over 65% and there is no change in the paint film; Test method: JIS K5400 8.21
Wet scrub resistance	Min 1500 cycles; Test method: SS5: Part 36: 1976
Accelerated weathering	Min 1000 hours exposure to sunshine weather meter; Test method: ASTM G53-88
Algal resistance	No sign of algal growth on the paint film; Test method: Blue green algae (Trentepohila Odorata) stay together with paint for 8 weeks
Halogenated Solvent Content (% wt)	<0.01; ASTM D4457-02
Aromatics Compounds Content (% wt)	<0.01; ASTM D3257-06
Application properties	No impediment for brushing work when making twice coating; Test method: JIS K5400 6.8
Humidity and cool heat cycling resistance	Gloss retention of 80% or more and endurable for humidity and cool heat cycling test; Test method: JIS K5400 9.4
Permeability	The permeated water amount in 24 hours. Less than 0.5ml; Test method JIS A6909-1995 6.13 Method B

Substrate: Interior and Covered Area Concrete/Plaster Wall & Ceiling

Apply 1 coat of waterborne acrylic sealer and 2 coats low sheen finishing of water based modified acrylic paint with the following specification:-

Test Items	Specifications
VOCs content	The VOCs content level is less than 150 g/L; Test method: EPA method 24
Viscosity	Min: 75KU, Max: 95KU; Test method: ASTM D562-81
Opacity	Min: 60%; Test method: BS 3900: D6: 1982
Drying time –20°C drying	Max: 1 hour; Test method: BS 3900: C3: 1990
Fineness of Grid	Max: 40um; Test method: BS3900: C6: 2000
Gloss (at 85° specular reflection)	>15; Test method: BS3900: D5: 1997
Wet scrub resistance	Min 1500 cycles; Test method: SS5: Part 36: 1976
Accelerated weathering	Min 500 cycles; Test method: ASTM G53-88
Algal resistance	No sign of algal growth on the paint film; Test method: Blue green algae (Trentepohila Odorata) stay together with paint for 8 weeks
Low temperature stability	No lumps and free from separation and aggregation of composing materials

Technical Specification:

Substrate: Metal Works

Apply 1 coat **of** pre-treatment coating for fresh galvanized metal and 1 coat epoxy heavy duty primer and 2 finishing coat of two-pack polyurethane with the following specification:-

Technical Specification:

Compliance with the following test results and the criteria for galvanized metal coating system

BS 3900 : Part C2:1994	Surface drying test
BS 3900 : Part C3:1990	Through dry test
BS 3900 : Part E1:1970	Bend test
BS 3900 : Part E2:1992	Scratch test
BS 3900 : Part E7:1974 (1992)	Resistance
BS 3900 : Part F3:1971 (1986)	Resistance to artificial weathering
BS 3900 : Part F4:1968 (1991)	Resistance to continuous salt spray
BS 3900 : Part F8:1993	Resistance to humid atmospheres containing sulphur
	dioxides

27.1 GENERAL

- (a) The ceiling system includes the ceiling panels, grid supports, suspension systems, associated works related to building services terminals, fittings, and fixtures, herein called the System.
- (b) The System shall be of a proprietary product supplied and installed by authorized agents of the manufacturer.

27.2 SCOPE OF WORK

- (a) The scope of work shall encompass the supply and installation of the System in accordance with the requirements of the contract.
- (b) The Contractor shall prepare the detailed design of the suspended ceiling installation for the Architect's approval.

27.3 PERFORMANCE

- (a) All ceiling and cladding, whether horizontal, vertical or inclined, shall be rigid enough to provide true and flat surfaces under the designed loads, including loadings from all mechanical electrical and fire-fighting fixtures and to be able to withstand lateral movement. No deflection under the maximum loadings shall exceed 1/360 of the spans.
- (b) The Contractor shall make provision in the detailed design for all additional hangers for air-conditioning grilles, fire-fighting fixtures, ceiling exhausts, light troughs, light fittings, and other fittings and the like, including suspended cubicle curtain tracks, suspended hooks, exit and other signs, joinery, etc.
- (c) Prior to installation, the Contractor shall check all actual dimensions on site and of the ceiling system based on final layout plans and other working details.
- (d) All shop drawings required shall be prepared by the Contractor using AutoCAD computer drafting system, the drawing format, conventions and layering of which shall comply with the ArchSD's standards drawing system.

The Contractor's detailed design for the System shall satisfy the performance requirements and include, inter alia, the following:-

- (1) Overall reflected ceiling and sections showing the configuration and layout of all ceilings;
- (2) Overall layouts and sections and design of suspension members including such members penetrating fire rated elements, if any;
- (3) infill and access panels;
- (4) assembly and all construction details;
- (5) junction details between ceiling and walls;
- (6) trimming details around openings;
- (7) construction details at changes in level;
- (8) work by other trades;
- (9) co-ordination with other trades, including the preparation of coordinated reflective ceiling which corresponds with the Coordinated Services Drawing prepared;
- (10) Provision of closure pieces for round light fittings, if any, to ensure that there is a neat joint with no gaps.

- (e) The Contractor shall also be responsible for:-
 - (1) Shop drawings;
 - (2) Schedule and monitoring of the works;
 - (3) Samples and mock-up at one whole room for the Suspended Metal Ceiling System, location of room to be determined by the Architect and may become part of the permanent works if accepted by the Architect;
 - (4) Co-ordination with works of the other trades;
 - (5) Protection;
 - (6) Hoisting and temporary site work.
- (f) The Contractor shall furnish all labour and materials, equipment and services necessary for and reasonably incidental to the furnishing and complete installation of the System as shown on the drawings and/or as specified herein.
- (g) Installation of all suspended ceiling and cladding works shall be in strict accordance with the manufacturer's specification and recommendation.
- (h) The finished works shall be smooth, clean and free from damage and defects.
- (i) Samples, colour and finish of all materials shall be submitted to the Architect for approval before ordering.
- (j) Unless otherwise specified, all materials shall be of the best quality of the types specified.
- (k) Ceiling grilles and light fittings shall be closely butt jointed with the adjoining ceiling panel. There shall be no overlapping of ceiling grilles or light fittings over the ceiling panels.

27.4 MANUFACTURER'S LITERATURE

The Contractor shall submit the Manufacturer's Specification, Technical Data, Performance Characteristics (including acoustics) and Installation Instructions which show or describe all items of work including:-

- (a) Performance standard;
- (b) Suspended system;
- (c) Arrangement of components;
- (d) Details of connection and anchorage; and
- (e) All other pertinent information.

27.5 SHOP DRAWINGS

(a) The Contractor shall submit shop drawings for the Architect's approval, such approval of which shall include approval of the samples, and approval of the mock-up, prior to the ordering and fabrication.

- (b) The shop drawings shall show:-
 - (1) The overall ceiling layouts and sections for each room incorporating junctions to adjoining structure, services terminals and other mechanical and electrical systems, and other related works,
 - (2) Coordination with other adjacent works such as E&M and B.S. equipment,
 - (3) Arrangement of components,
 - (4) Sequence and details of fabrication, assembly and erection,
 - (5) Full size details,
 - (6) Dimension and thickness,
 - (7) Materials and finishes,
 - (8) Location and spacing of screw, hangers, anchorage and other accessories, together with structural calculations if necessary,
 - (9) All other pertinent information.
- (c) Review of any data, approval of shop drawing shall not mitigate the Contractor's responsibility for the performance of the works nor relieve the Contractor of his responsibility to verify for himself that the work conforms to the Contract.
- (d) When the shop drawings are approved, one (1) soft copy, four (4) printed copies and one (1) reproducible print for each of the final approved shop drawings shall be submitted for the Architect's use.
- (e) Should the Contractor consider it is necessary to fabricate or order any item before approval in order to meet completion date, it is entirely at his own risk and no compensation in time or cost will be granted if the material and/ or workmanship is eventually not acceptable to the Architect

27.6 MOCK-UP SAMPLES FOR APPROVAL

- (a) After the approval of shop drawings, the Contractor shall fabricate, deliver to and install on site, sample mock-ups of the System for the Architect to review on construction and design details. The number of mock-ups required shall be at the discretion of the Architect, and the Contractor is deemed to have fully allowed for this in his tender.
- (b) The sample mock-ups shall be of at least 6m x 6m module units or the equivalent of a room respectively for each type of the ceiling systems. The locations of the mock-ups shall be determined by the Architect. The sample mock-ups may become part of the permanent works if accept by the Architect. Mock-up to include whole room if acceptable to the Architect may become part of the permanent works.

27.7 WORKMANSHIP AND INSTALLATION

- (a) Construct suspended ceilings in accordance with CP 290. Fix proprietary systems in accordance with the manufacturer's recommendations. Ensure that ceilings tiles and grids are properly set out and that all cutting is done at the perimeter. Fix all cover strips, edge trims and the like.
- (b) The contractor shall verify all as-built dimensions and conditions on site before commencing the ceiling works. The highest workmanship is required and all works shall be performed in an efficient and expedient manner by skilled operatives experienced with the type of installation.

- (c) Ceiling shall be constructed square and true to plane, both in themselves and in relationship with each other where installed in a continuous plane. All components and materials shall be carefully handled at work and on site, both during delivery or handling. Any damaged or defective materials will be rejected.
- (d) Screws and Plugs
 - (1) Screws to be brass, stainless steel, alloy or other non-corroding metal to BS 1210 with countersunk heads, unless otherwise specified. Steel screws are only to be used for temporary work.
 - (2) Screw lengths to be not more than the total thickness of sections to be joined, less 5mm, or not less than one and a half times the thickness of section through which screws are driven.
 - (3) Where the thickness of the outer section being screwed is less than half that of the section to which screwing is being done, the depth of penetration of the screwing into the latter to be not less than the thickness of the outer section.
 - (4) Plugs for fixing to hard materials to be proprietary plugs of plastic, soft metal, fiber or similar.
 - (5) Fixing to friable materials, plasterboard and the like are to be proprietary fixings specially designed for that situation.
 - (6) The use of wood plugs shall not be permitted.
- (e) Openings, Joining and Connections
 - (1) Drill or cleanly punch openings, so that these holes will be accurate, clean, neat and sharp, without deforming adjacent surfaces.
 - (2) All fastening, jointing and splicing shall be by concealed fastening with joints accurately fitted, flush, and rigidly secured.
 - (3) Exposed fasteners shall only occur where expressly permitted by the Architect.
- (f) Installation
 - (1) Install all work square, plumb, straight, to line accurately fitted and located, with flush tight hairline joints if practicable (expect as indicated otherwise), with attachment devices as required for secure and rigid installation.
 - (2) It is the responsibility of the Contractor that shop fabricated items shall properly fit the site conditions.
 - (3) In case where the shop fabricated items do not fit the site conditions, the items shall be returned for correction at the Contractor's own expense.

- (g) Built-in Works
 - (1) Unless otherwise indicated, works to be built into concrete or masonry shall be anchored with shop-welded-on galvanized steel strap anchors or galvanized steel hanger bolts.
 - (2) Provide all supplementary parts necessary to complete each item of work of this section.
- (h) Attachment
 - (1) All attachment devices shall be of the type, size and spacing to suit site conditions and as approved by the Architect.
 - (2) Provide adjustment hangers, shims, slotted holes or other means necessary for leveling, plumbing and other required adjustments.
 - (3) Attachment device for work exposed to view shall be concealed, unless otherwise indicated.
 - (4) Where bolts or screws are permitted in work exposed to view they shall have finish matched to adjacent surfaces.
 - (5) Do all necessary drilling, tapping, cutting, shimming, or other preparations of surrounding construction on site accurately, neatly and as necessary for the attachment and support of all work, but obtain Architect's approval prior to such preparatory work to other Contractor's work.
- (i) Tolerance
 - (1) All work shall be plumb, square, level, and correctly aligned. The acceptable tolerances shall be in accordance with BS5606:1990.
 - (2) All joints shall align on dead center. The maximum deviation from the nominal plane shall not exceed +/-2mm in every 3m run.
- (j) Protection and Cleaning
 - (1) Protect all work from damage during transportation, storage at job site, erection, and subsequent construction activities.
 - (2) Exposed materials shall be wrapped with heavy reinforced, non-staining paper or other approved methods before installation.
 - (3) After installation, provide additional temporary protection as required to protect all work from damage during subsequent construction activities. Soiled works shall be cleaned and touched up where scratched or scuffed with appropriate paint supplied by manufacturer. Scratched materials of more than 5mm are considered to be defective.
 - (4) Any defective or improperly installed components shall be replaced with new materials at the expense of the Contractor.

- (k) Technical Specification
 - (1) The System shall be of a proprietary product and shall be in accordance with the design intent illustrated in Drawings.
 - (2) The specified ceiling types are as follows:

Non-perforated aluminium ceiling; 600 x 600mm panel size, 0.7mm thick, Clip- In system in white colour 9010. Shall meet Class 1 Surface spread of Flame to BS 476: Part 7 and class Fire Propagation Test to BS 476: Part 6: 1989 Class) as defined by Building Regulations. The ceiling tiles shall have a minimum reflectance value to 87%. Suspension system shall be hot dip galvanized steel suspension system.

- (3) Suspension system shall be as follows:
 - (a) Specifically, level suspension system to within 3mm per 3m in and direction with no cumulative variation greater than 3mm. Maximum deflection shall not exceed 1/360 of span under maximum design load with no apparent deflection under normal circumstance.
 - (b) The suspension system shall be designed to carry the ceiling dead load and any reasonably imposed load resulting from maintenance.
 - (c) Rows of 'L' shaped, 1.5mm thick galvanized steel primary angles shall be installed at 1.2m centers supported by 'First Metal' hanger system fixed to the structure at a maximum distance of 1.0m on centers in all directions.
 - (d) Primary suspension runners will be fixed on both ends to prevent upward movement. 1.5mm thick galvanized steel secondary runners shall be fixed perpendicular to the primary suspension at a correct distance to support the planks end.
 - (e) Trapeze hangers or other special arrangement of suspension system shall be provided to suit and support all the various building services terminals including FS sprinklers, lights, and to support all other fittings including curtain rods for cubicle curtains, as required.
 - (f) All suspension profiles shall be rigidly braced to prevent vertical and horizontal movement. Ceiling panels and where necessary the systems, shall be demountable for access to the mechanical equipment within the ceiling voids for maintenance. The panels and the systems shall be readily re-installed without damage to the ceiling assembly.
- (4) At perimeters all panels are manufacturers' cut with 1.5mm thick aluminium L-shape recess trimming in matching colour.
- (5) All fixing lugs and anchors, supporting members, hinge hangers bracing, brackets, straps and similar attachments shall be of aluminium, non-magnetic, stainless steel, zinc-coated steel or galvanized steel, and shall be concealed.
- (6) Note that while the basic ceiling tile module is 600 x 600mm there are certain panels whose length in one direction is greater than 600mm shown on the drawings. The Contractor should fully allow for these longer panels than 600mm in his design, shop drawings and installation.

- (I) As-Built Drawings and Operations & Maintenance Manual
 - (1) The Contractor shall update the shop drawings as necessary to reflect the final installation and submit these as as-built drawings in both digital and printed formats (3 copies), to the Architect.
 - (2) The Contractor shall submit the Operations and Maintenance Manual for the Works showing the information described herein the following where applicable:
 - (a) required maintenance regime comprising periodic cleaning, servicing, checking and inspection,
 - (b) trouble-shooting checklists,
 - (c) list of envisaged faults and damages, together with recommendations for repairs covering materials, parts, methods, protection and commissioning,
 - (d) authorized agents or specialist contractors and their contact information
 - (3) The Contractor shall supply 4 nos. special keys for removing ceiling panels at the same time that he supplies the above manual.
- (m) Specialist Sub-contractor

Authorized agents of the manufacturer shall carry out the works as the Specialist Sub-contractor, thoroughly experienced with the installation of the named proprietary system or equivalent, under the direct employment of the Contractor, as approved by the Architect.

(n) Spares

Provide 2% of spare ceiling tiles of the different sizes, with a minimum of five nos. tiles to the Architect's agreement and deliver to a location in the Clinic as directed by the Architect.

PARTICULAR SPECIFICATION Building Services Installation

B2 Electrical System

B2.2 General Lighting and Power System

B2.2.1

- a) <u>General</u>
- The Contractor shall design, supply, install and connect a general lighting and power system in conduit wiring comprising lighting fittings, cables, conduits and accessories, lighting switches, power sockets and plugs, etc, in accordance with this specification and the drawings.
- ii) Concealed conduit system shall be adopted throughout the building as far as practicable. Surface conduit system shall only be accepted if they are specified or concealed inside false ceiling and/or double slab. Hangers and saddle shall be provided to ensure that the conduits are properly fixed.
- iii) All lighting and power wiring shall be run in heavy duty PVC conduit, unless otherwise specified, concealed in ceilings, walls and floors except in plants rooms where surface galvanized steel conduit wiring shall be used.
- iv) Surface conduit wiring may be used in areas with false ceiling but the vertical conduit drops to lighting switches and power points shall be concealed in walls.
- b) Final Circuits/Control Circuits Cabling
- i) Conduit system and trunking system shall be completely erected before cabling.
- ii) The maximum number of cables that can be accommodated in a given size of conduit/trunking shall be in accordance with the IEE Wiring Regulations.
- iii) In conduit or trunking system, where outlets for Category 1 and Category 2 circuits, as defined in the I.E.E. Wiring Regulations, are mounted in or on common boxes, switch plates or blocks, the cables and connections of the two categories of circuits shall be partitioned by means of rigidly fixed screens or barriers.
- iv) All wiring shall be carried out on the loop-in system in one continuous length between terminal points. No intermediate joints or connectors will be allowed in any such cables.
- v) Cables for each final, sub-main or control circuit in trunking system shall be individually bunched and tied together.
- vi) Each final circuit shall be connected to a separate way in the designated distribution board. The wiring of each final circuit shall be electrical separate from that of every ether final circuit, so as to prevent indirect energisation of a final circuit intended to be isolated.
- vii) Each circuit conductor of a ring final circuit shall be run in the form of a ring, commencing from a way in the distribution board, looping into the terminals of socket outlets connected in the ring returning to the same way of the distribution board.
- viii) Where cables are installed in trunking which pass through floors and walls, suitable internal fire-resistant barriers shall be provided to prevent the spread of fire.
- ix) Where cables pass through holes in metalwork precautions shall be taken or prevent abrasion of the cables on any sharp edges.
- x) Where appropriate, final connections to fixed equipment shall be by means of PVC cables in flexible conduits as specified.

- xi) Exposed ends of conductors of 6 sq.mm and above, where not provided with cable sockets, shall have their individual strand sweated solid before connection to apparatus terminals.
- xii) Cables shall be fed into the conduit in such a manner as to prevent any cables crossing, and also to avoid them being pulled against the sides of the opening of the draw-in box. The drawing-in shall be assisted by rubbing chalk on the cables.
- xiii) Where cables are to be installed in PVC conduit and trunking system, each final circuit or submain circuit shall be provided with its circuit protective conductor.

The minimum cross-sectional area of the circuit protective conductor shall be chosen according to Table 54F of the I.E.E. Wiring Regulations. The circuit protective conductor of each circuit shall be run along with its associated circuit.

The live conductors and the circuit protective conductor of final circuit or sub- main circuit shall be individually bunched and tied together within conduit system.

B2.2.2 PVC Conduits and Accessories

- a) No conduit smaller than 20 mm shall be used in any installation. All conduits of and fittings, except as otherwise specified, shall be heavy gauge and comply with BS 4607 : Part 1 and BS 6099 : Section 2-2. conduits shall be type "A" i.e. they shall be satiable for installation, storage or transport at temperatures not normally below minus 5 deg.C (compilers shall be of the slip type).
- b) Concealed conduits shall be fixed securely before casting of floor slabs, coating of plaster and casting of columns and beams. Conduit openings shall be plugged by means of corks stoppers to prevent the ingress of foreign matter and moisture. Extension rings to conduit shall be installed to avoid traps where water may accumulated.
- c) Conduits shall be mechanically continuous and the system watertight. Provision shall be made for drainage of condensed moisture.
- d) Conduits up to 25 mm diameter may bald cold with the appropriate bending spring (obtained from the conduit manufacturer) inserted internally. The inner radius of every conduit bend shall be not less than 2.5 times the outsides diameter of the conduit. Draw-in boxes shall be provided after every two 90 C bends, or after a bend plus a total maximum straight run of 10 m, or after a maximum straight run of 15 m. Burrs and sharp edges are to be removed from the ends of conduits before installation.
- e) Conduit terminating at PVC boxes, distribution board and trunking or tray shall be made either with solid coupler and male bushing or at threaded part of the BESA boxes. Conduit joints shall be made with solid coupler or with locknut and union joints.
- f) All plastic boxes including adaptable boxes, surface boxes for the enclosure of electrical accessories or wiring cables shall be made from accessories materials and shall comply with BS 4662 and BS 1363, complete with adjustable lug, ample knockouts, and brass earth terminals fitted in the base. The dimensions of the plastic boxes shall be such that they can be inter-changeable with steel boxes. The minimum wall thickness of boxes shall be 2 mm.

Boxes for the suspension of luminaries or other equipment, where considerable heat will be produced, shall be fitted with steel insert clips. Plastic boxes shall not be used in situations where the temperature of the box is likely to exceed 60 C or where the mass suspended from the box exceeds 3 Kg.

- g) The method of carrying out the conduit bends, conduit joints, fixing conduits to boxes without spouts, and the tools and materials to be used shall be as recommended by the manufacturer of the conduits.
- h) PVC flexible conduit shall <u>not</u> be used. Flexible conduits and fittings shall be to B.S. 731 : Part 1 : 1952 and used for connection to equipment subject to vibration and movement, and for lighting fittings installed on suspended ceilings where appropriate. Flexible conduit shall be of the metallic watertight pattern, flame retardant PVC oversheathed with separate tinner copper earth wire. Where it is fixed to a rigid conduit or terminating at a rigid body, either a male or female adaptor shall be used. The adaptor shall be of brass, sweated with on end screwed onto the flexible conduit.
- i) Where appropriate, conduit junction boxes shall be of the circular pattern with appropriate spout entries.
- j) All boxes and conduit accessories shall be fully weatherproof when used in outdoor locations. Weatherproof boxes and conduit accessories shall also be sued in locations other than outdoors when so specified on the Drawings.
- k) All conduits shall be jointed and terminated in accordance with the manufacturer's instructions. Permanent adhesive shall be used where rigid water-tight joints are required, in conjunction with standard couplers and accessories. Flexible adhesive shall be used where expansion facilities are required in long conduit runs, in conjunction with expansion couplers.
- I) Where bending larger size conduits, the section to be bent shall be heated uniformly until it is pliable. When the conduit is well heated, it shall be bend around a suitable former with the appropriate bending spring inserted internally.
- m) Adequate allowance shall be made for linear expansion and contraction of the conduits under normal working temperature. Expansion couplers shall be used on all straight runs of conduit exceeding 6 m in length. Conduit shall be free to slide within saddles.
- n) Special consideration shall be given to the fixing of accessories in situation where the temperature fluctuates excessively. Oversized or slotted fixing holes shall be used.
- Conduits shall be supported with saddles at a distance not exceeding 1.2 metres in accessible positions. Where working temperatures tend to be high, the spacing shall be reduced accordingly.
- p) Notwithstanding the above, the works carried out shall be strictly in accordance with the requirements as specified for the conduits and conduit accessories here above, wherever applicable.

B2.2.3 Galvanized Conduits and Accessories

- a) Separate conduit system shall be provided for extra low voltage circuits.
- b) Conduits and fittings shall be hot dipped galvanized steel screwed conduits throughout. No conduits smaller than 20 mm shall be used in any installation. All conduits shall comply with B.S. 4568, Part 1 Class 4 and conduit accessories shall comply with B.S. 4568 Part 2.
- c) Concealed conduits shall be fixed securely before casting of floor slabs, coating of plaster and casting of columns and beams. Conduit openings shall be plugged by means of corks or stoppers to prevent the ingress of foreign matter and moisture. Concealed conduits shall be installed to avid traps where water may accumulate.

- d) All surface conduits shall be run in a vertical or horizontal direction. Diagonal runs shall not be permitted. The conduits shall be secured to the surface by means of heavy spacing galvanized saddles fixed with brass or non-corrosive screws fixed in Rail-plugs or approved equivalent. On straight runs, 20 mm and 25 mm conduits shall be supported by not less than one saddle every 1.2 m in addition to any support provided by structures, boxes or fittings, etc. Bends shall be supported by two saddles fitted as near to either side of the bend as practicable.
- e) Conduits shall be electrically and mechanically continuous and the system watertight. Provision shall be made for drainage of condensed moisture.
- f) Conduits shall be formed on an approved bending machine, and the conduit shall not be flattened or distorted at the bend. Galvanized cast iron draw-in boxes shall be provided after every two 90 C bends, or after a bend plus a total maximum straight run of 10 m, or after a maximum straight run of 15 m. Burrs and sharp edges are to be removed from the ends of conduits before installation.
- g) All conduit fittings and accessories shall comply with the appropriate British Standards. Externally installed systems shall be made watertight.
- h) Conduit terminating at metal boxes, distribution board and trunking shall be made either with solid coupler and heavy gauge brass male bushing or at threaded part of the BESA boxes. Conduit joints shall be made with solid coupler or with locknut and union joints. Exposed screw threads and all parts where the galvanizing has been damaged shall be thoroughly cleaned and painted with two coats of anti-corrosive paint: such painting shall be applied as the work proceeds.
- i) The maximum number of cables permitted in one conduit shall be in accordance with the 16th edition of I.E.E. Wiring Regulation. Draw wires shall be provided in conduits for other trades.
- j) Flexible conduits shall be to B.S. 731 : Part 1 : 1952 and used for connection to equipment subject to vibration and movement, and for lighting fittings installed on suspended ceilings where appropriate. Flexible conduit shall be of the metallic watertight pattern with separate tinned copper earth wire. Where it is fixed to a rigid conduit or terminating at a rigid body, either a male or female adaptor shall be used. The adaptor shall be of brass, sweated with one end screwed onto the flexible conduit.

B2.2.4 <u>Wiring Accessories</u>

- a) Lighting Switch
- i) Lighting switches shall be of 5A and 10A rating single pole, microgap type and comply with BS 3676. The lighting switches shall not be derated when used with fluorescent or inductive loads.
- ii) Where switches are shown adjacent to one another on the Drawings, multi-gang switch units shall be use, except for switches controlling circuits for different phases.
- iii) Separate lighting switches shall be provided for essential lighting circuits.
- iv) 2 way lighting switches shall be provided where specified.
- v) For groups switch panels, each switch shall be labelled to indicate the area controlled.
- b) Socket Outlets and Plugs
- i) Socket outlets and plugs shall be 3 pin, 2A, 5A, 13A or 15A as specified on the Drawings. With the exception of 3 pin 2A socket outlets fixed on ceiling or at high level, all socket

outlets shall be switched or shuttered type complying with BS 546 and BS 1363, where applicable, and marked with appropriate phase colour in a permanent manner.

- ii) 13A plugs shall comply with BS 1363, with fuses complying with BS 1362.
- iii) Socket outlet shown as "twin" on the Drawings shall be twin socket outlet.
- iv) The earthing terminal of each socket outlet shall be connected an insulated conductor of 2.5 mm² to an earthing terminal incorporated in the conduit box.
- c) <u>Fused Spur Units</u>
- i) Fused spur units shall be of double pole switched type complying with BS 5733 with flexible cord outlet and fitted with cartridge fuse links complying with BS 1362.
- ii) Spur units shall be fused 13A for small power circuits, unless otherwise specified.
- iii) The earthing terminal of each spur unit shall be connected by air insulated conductor of 2.5 sq.mm to an earthing terminal incorporated in the conduit box.

d) <u>Telephone Outlets</u>

A blank PVC plat shall provided and installed by the Contractor before the installation of telephone outlet by the telephone service provider(s) chosen by the Employer.

e) <u>Connection Units</u>

Connector units shall comply with BS 5733 complete with terminal block and cable clamp mounted on a steel grid.

f) <u>Double Pole Switch with Pilot Light</u>

- i) D.P. switch shall be all insulated square plate flush pattern suitable for mounting on BS 4662 boxes. The plate shall be engraved with English and Chines for the electrical appliance served.
- ii) D.P. switch with pilot light shall comply with BS 3676 : 1963. Pilot light shall be a neon lamp with resister and a red coloured lens and be on when switch is 'ON'.

g) <u>Batten Lampholders</u>

Batten lampholders shall be all insulated, bayonet socket with `HONE OFFICE' ventilated shield and plastic break joint ring cream colours.

h) <u>Time Switches</u>

- i) Time switches shall be self-contained units suitable for mains operation. All units shall have a self-starting synchronous motor with a single-pole fuse in the motor circuit, a 3 way terminal block and a 36 hour spring reserve complete with an automatic solar dial.
- ii) When fitted, the solar dial shall be capable of switching ON at sunset and OFF at sunrise throughout the year by control of a secondary calendar dial with month and day settings, and the automatic switching time shall be adjustable.
- iii) Time switches shall be encased in a dust-tight metal casing have a hinged front cover with a clear perse x window. The casing shall be effectively earthen.
- iv) A manual by-pass switch shall be incorporated with the time switch to facilitate maintenance of the latter.

i) <u>Contactor</u>

Contactors for lighting control, either locally remotely or through timers, shall comply with BS 5425 : Part 1, utilization category AC-2, Class 3 intermittent duty, and shall have a current rating of not less than that of the outgoing switchgear to which they are connected, and in any case not less than 20A.

B2.2.5 <u>Luminaries</u>

a) <u>General</u>

- i) All components within the luminaries shall preferably be of the same manufacturer to ensure compatibility. All similar items of equipment shall be interchangeable.
- ii) Unless otherwise specified, all luminaries offered shall be as per manufacturer's standard as indicated on the Luminaries Schedule, except that all luminaries shall be modified, if not already catered for, to accept conduit termination, without compromising the quality of the product.

b) <u>Fluorescent Luminaries</u>

- i) All electrical control gear shall be totally built into the fitting assembly. Separate ballast, starter and power factor correction capacitor shall be provided for individual lamp.
- ii) Fluorescent lamps shall be manufactured to B.S. 1853 with bi-pin lamp cap and with wattage as shown on the schedule.
- iii) Ballasts for the fluorescent fittings shall be to B.S. 2818 and of switch start type with low losses suitable for incorporation within the fittings they serve. The ballasts shall be impregnated and filled solid with polyester of other approved special high melting point compound all contained in a robust steel case.
- iv) Capacitors for use in tubular fluorescent, high pressure mercury and low pressure sodium vapour lamp circuits shall comply with B.S. 4017 : 1979 and fitted with quick connect terminals in lieu of leads. One capacitor shall be provided in each fluorescent fitting to correct the power factor to 0.85 lagging or above. Construction shall be of the metal foil type enclosed in metal case with insulated connections and safety discharge resistor.
- v) Starters shall be of the glowtube type and be fitted with radio interference suppressor comply with BS 3772.
- vi) Fluorescent Lampholders shall be of bi-pin moulded plastic type, non-flammable, with quick connect sockets for the connection of wiring, to BS 6702 : 1986 and designed to retain positively the lamp caps independently of the contract springs. Unless otherwise stated, diffusers shall be opal 040 material and edge moulded. The Material shall be such that no discolouration will occur with usage.
- vii) Internal wiring for fluorescent fittings shall be carried out in 85 C PVC flexible cable. Terminations for connection to "Quick-Connect" terminals shall be machine made, and shall be covered with insulated shrouds. Wiring shall be grouped within the fitting and clipped to the housing at maximum 230 mm centres.

Wiring shall be kept well clear of ballasts. Wiring shall be brought to a 3 way terminal block in each fitting for the connections of external active, neutral and earth conductors. A cartridge type fuse of appropriate rating shall be provided in the terminal block.

- c) <u>Installation</u>
- i) All luminaries shall be adequately and rigidly supported in an approved manner. In all

cases, all luminaries shall be suspended independently. The approximate mounting height of the luminaries are indicated on the Drawings and shall be as directed and agreed on site.

- ii) Final connections to luminaries in areas of suspended ceiling shall be in flexible conduit system.
- iii) Batten fluorescent luminaries shall be suitable for mounting either directly or through the suspension baseplate to a BESA box. Where directly wall/ceiling mounted, they shall be so arranged that the fitting is supported by two BESA boxes. Where tube pendants are required, the normal method of fixing shall be by dome cover, conduit dropper to the fitting and a brass hexagon bush shall be installed from the inside of the fittings into the conduit coupler. There shall be not less than two supports for each fitting. Where the basic batten cannot fully cover the circular conduit box, a pattress block cover made of 0.5 mm thickness mild steel, finished in white shoved enamel shall be supplied with each basic batten spine to shield the conduit box outlets.
- iv) Luminaries shall <u>not</u> be used as 'through boxes' for circuit wiring.
- v) Where luminaries are to be suspended by chains, the chains shall be chromium plated steel, with 20 mm oval links. Electricity supply to the luminaries shall be obtained from a 2A 3-pin socket outlet enclosed in a circular conduit box in ceiling via a 3-core circular flexible cable of a size not less than 1.0 mm².
- vi) When a luminaries is used in which a surface cable entry has not be provided, the luminaries shall be mounted on a shaped wooden batten or pattress and the cable shall enter the rear of the luminaries through a slot and a hole in the batten.
- vii) The contractor shall be responsible for the care of all lighting fittings prior to the handing over of the building, and shall have damaged fittings and accessories replaced. All lighting fittings, diffusers, etc. shall be cleaned at the time of handing over.
- viii) Where wiring passes through passes the edge of any metal section not the fitting, it shall be protected by an approved grommet. All connections of wires to terminals shall be of approved types. All wirings shall be concealed from view with the luminaries installed.

B2.2.6 <u>Electronic Ballast</u>

- a) Ballasts must be the manufacturer's best sound rating, and the sound rating indicated on the ballast. Ballasts found to be unduly noisy shall be replaced without charge prior to acceptance of the job.
- b) Ballasts shall be high frequency electronic type, operating lamps at a frequency of 30 kHz or higher with no detectable flicker.
- c) Ballast efficiency as measured by the ratio of total lamp watts divided by total input watts shall not be less than 0.9 for single and two lamp ballasts and 0.95 for three and four lamp ballasts.
- d) Relative Light Output (percentage of light emitted with reference tube and ballast) shall be not less than 95% and not more than 100%.
- e) Ballast shall comply with BS 2818 and withstand line transients as defined in IEEE Publication 587 Category A.
- f) Ballast case temperature shall not exceed 25°C temperature rise over 40°C ambient.
- g) Ballast Power Factor shall be higher than 0.95.

- h) Ballast shall provide continuous heating voltage to lamp cathodes and operate lamp(s) on a rapid start circuit unless otherwise noted. Flicker index shall be less than 0.1 (5%).
- i) The electronic ballast shall be approved by recognized test laboratory and approval marked to show compliance with EN55015, IEC928 and IEC1000.3.2 or their equivalence, in terms of EMI, safety, performance and harmonic distortion respectively.
- j) The electronic ballast shall be suitable to operate at an embient temperature range from -15° C to $+50^{\circ}$ C.
- k) The average service life of the electronic ballast shall be 50,000 hours at the maximum case temperature.
- I) The failure rate shall be less than 1% per 4000 hours at the maximum case temperature.

B2.3 <u>Trunking and Conduit Provision for Extra Low Voltage Systems</u>

- a) The trunking and conduit for all extra low voltage items shall be the same as those provided for the power installation. Draw wire shall be provided inside all conduit for such purpose.
- b) All conduit for the extra low voltage system shall be of minimum size of ø20mm, conduit smaller than ø20mm shall <u>not</u> be use.
- c) Prior to the installation of these trunking and conduit, the Contactor shall obtain the information of the signalling cable to be installed from the Client and submit working drawing for approval.

B2.4 Earthing and Bonding System

- a) The Contractor shall design, provide, install, test, commission and set to work a complete earthing system including bonding of all exposed conductive parts of the Electrical Installation, supplementary bonding of metal work in the Building and main equipotential bonding of the incoming services at the entry point, all as described in the Electrical General Specification and this Specification, shown on the drawings or so called for by the 16th Edition of the I.E.E. Wiring Regulations.
- b) Bonding and earthing conductors installed inside the explosion-proof area shall be PVC insulated.
- c) The main equipotential bonding conductors shall be of copper and shall be connected the extraneous conductive parts of others services within the premises to the main earthing terminal of the installation. Such extraneous conductive parts shall be on the installation side of the possible breaks in the system, such as gas meter or water meter.

The main equipotential bonding conductors shall be securely and reliably connected to extraneous conductive parts of the non-electrical services by means of a copper connector-clamp of an approved type suitable for the particular applications. All contact surface shall be clean and free from non-conducting materials, such as grease or paint, before, the connector-clamp is installed.

d) Supplementary bonding conductors shall be of copper. In shower rooms, all simultaneously accessible conductive parts (either exposed or extraneous) shall be locally connected by means of supplementary bonding conductors. In other areas, supplementary bonding of extraneous conductive part shall be made whenever such conductive parts are likely to be accessible simultaneously with other extraneous conductive parts or exposed conductive parts, and are not electrically connected to the main equipotential bonding by means of permanent and reliable metal-to-metal joints of negligible impedance.

The supplementary bonding conductors shall be solidly and effectively connected to the extraneous or exposed conductive parts by means of a copper connector-clamp of an approved type suitable for the application. All contact surface shall be clean and free from non-conducting materials, such as grease or paint, before the connector-clamp is installed.

e) For surface conduit installations, the supplementary bonding conductors shall be terminated at the nearest conduit or conduit box forming an integral part of the conduit installation.

For concealed conduit installations, the supplementary bonding conductors shall be terminated at, via a telephone cord outlet plate, a copper earth terminal fitted inside a BS 4662 metal box forming an integral part of the conduit installation. The BS 4662 metal conduit box shall be located as near as possible to the bonding position and the exposed part of the supplementary bonding conductor shall be made as short as possible.

- f) All earth tapes for electrical installation shall be securely bonded to the relevant main earth bar in switch room. One (1) no. of 25 mm x 3 mm tinned copper tape shall be provided and run alongside each rising main in the cable duct/meter room on every floor. An individual circuit protective conductor shall be provided for each MCB board in the building, with the size selected in accordance with I.E.E. Regulations, and terminated at the related earth tape at the corresponding floor. When sub-main feeders are enclosed in conduit or trunking system, individual circuit protective conductors of similar means shall be provided. Tinned copper earth bar of 50 mm x 6 mm shall be provided in the switch room for grouping together all bonding points.
- g) Purpose made earthing clamp shall be used whenever necessary to bond up pipes and equipment to be earthen. Method and sample of bonding shall be submitted for approval.

B2.5 <u>Painting</u>

- a) The Contractor shall allow for painting all conduit/trunking as below conditions:
 - i) Within plant rooms and false ceiling void

Provide identification bands at 2 m intervals, at entry and exit points through walls and floors, and in such other positions as are necessary and as directed on Site. The colour bands shall be of lengths not less than 50 mm.

ii) In areas other those listed in items (i) above

Paint all through, including the associated hangers and supports.

- b) All metallic surfaces shall be wire-brushed and cleaned form rust, scale, dirt and grease, and shall then be painted not less than one coat approved priming paint, not less than two approved under-coats and approved high gloss finishing coat.
- c) The primer shall be genuine red lead paint, the remainder shall be genuine oil paint.
- d) Colours for finish painting will be selected by the M&E Consultant and different colours will be selected for different items and locations. The type of paint to be used shall be submitted for approval before use.

B2.6 Identification and Labelling

- a) <u>Colour Identification</u>
 - i) All cables used as protective conductors, including earthing conductors, main equipotential bonding conductors supplementary bonding conductors and circuit protective conductors shall be identified by the colour combination "green and yellow". Such colour combination shall not be used for other identification purpose.
 - ii) Base conductors used as protective conductors shall also made similarly identifiable, where necessary, by the application of tapes, sleeves or disc, or by painting with the above colour combination.

b) <u>Labelling</u>

- i) The Contractor shall supply and install suitable labelling for the Electrical Installation to help to identify the circuitry. Every switchgear of the main switchboards and all flush and/or surface mounted switchgear shall be properly labelled to indicate the rating and function of the circuit under protection. MCB/MCCB/RCCB boards shall also be labelled to indicate the names of the circuits or the area covered by the final circuits.
- ii) All labels shall be manufactured from traffolyte plastic materials or similar labels of ample sizes, engraved in English and Chinese characters and fixed by chrome plated screws.
- iii) All label inscription and colour of label and lettering shall be to the approval of the M&E Consultant.

B2.7 Spares Parts and Tools

- a) The Contractor shall supply the following items as spares. These spares shall be handed over to the Employer and will not be allowed of be used as replacement items on practical completion of the whole installation or during the Defects Liability Period.
- b) Sub-main Distribution System

HRC fuses : 2 sets for each type of fused switch to be adopted in this project.

Miniature Circuit Breaker : 2 sets for each type of MCB to be adopted in this project including the combine MCB/RCD.

5% of total number of each type of socket outlet, lighting switch & fuse connection unit, with a minimum of 4 number for each type.

c) Lighting Fittings

Lamp bulbs : 5% of the total installed quantities of each type of lighting fitting for this project, with a minimum of 4 numbers for each type.

d) The Contractor shall also propose a list of spare parts (and their unit prices) for all other major equipment as recommended by the manufacturer – sufficient for one year's operation. These spares may be wholly or partly purchased at the discretion of the Employer.

B2.8 Testing & Commissioning

- a) <u>General</u>
- i) In addition to all commissioning and testing called for elsewhere in this Specification, the Contractor shall carry out all necessary testing and commissioning procedures comprising test at maker's acceptance tests.
- ii) Tests shall be carried out in accordance with the appropriate British Standard or B.S. Code of Practice and I.E.E. Wiring Regulations.
- iii) All tests shall be witnessed by the Architect and shall be properly certified in a manner to be agreed with the Architect and triplicate copies of all certificate shall be issued to the Architect on completion.
- iv) These tests records, certificates and performance curves shall be supplied for all tests, whether or not they have been witnessed by the Architect. The information given on such test certificates and services shall be sufficient to identify the material or equipment to which the certificate refers, and shall also bear the Contract reference and heading given in equipment section.
- v) Only when the installations have been so certified and all test figures and other relevant information has been recorded in the prescribed manner and accepted by the Architect should the works be considered fit for handing over to the Client.
- vi) The Contractor shall include in his tender all costs associated with the above mentioned testing and commissioning procedures including the cost of making good any defects arising out of such test and having the work retested. Such costs shall also include the provision of all instruments necessary for the test.
- vii) The Contractor shall be responsible for the supply of all testing equipment necessary for the testing and commissioning of the entire system.

b) <u>Commissioning & Acceptance Tests</u>

- i) The Contractor shall be responsible for the submission of all equipment for site inspection and tests as required by the Architect.
- ii) During the course of erection, the Architect shall have full access for inspection of the progress of the work and checking workmanship and guarantee as may be required.
- iii) The Contractor shall be sure that all equipment included under this Contract is thoroughly cleaned and checked for serviceability immediately before commissioning. Particular attention is drawn to the removal of building debris, unwanted material from the plant prior to carrying out any commissioning checks.
- vi) All test equipment shall be made available at site by the Contractor. All costs incurred for these tests shall be borne by the Contractor.
- v) The Contractor shall give to the Architect in writing three weeks' notice of the date after which he will be ready to make the site tests. Unless otherwise agreed, the tests shall take place within 10 days after the said date.
- vi) In the event of any test indicating failure to comply, that test and those preceding, the result of which may have been influenced by the fault indicated, shall be repeated after the fault has been rectified.

c) <u>Performance Tests</u>

- i) After the works have been accepted, the Contractor may be required to carry out or assist in carrying out additional performance tests. Such tests if required will be specified at the appropriate time.
- ii) Any such tests would be carried out at the rates offered and agreed at the time of Tender and shall be included in the Contract Sum for testing and commissioning.

d) <u>Testing Requirements</u>

Tests shall be performed to rectify that the complete installation will meet the requirements of this Specification and HKIEd's requirements. Cables, L.V. System, Lighting, Earthing System, PABX System, Card Access System, Panic Alarm System, shall have the following minimum of the tests required:

- i) Polarity Test shall be carried out to ensure that
 - 1) All single-pole control devices and fuses are in the live-conductor only.
 - 2) The outer contacts of centre-contact bayonet and Addison-screw lampholders are connected to the neutral conductor; and
 - 3) Plugs and socket outlets are correctly connected.
- ii) Insulation tests shall be carried out at a voltage of at least 500 volts, involving

Live to earth resistance test for each line conductor in each part of the installation. Final sub-circuits, and sub-mains shall be separately tested.

Neutral to earth resistance test under the same conditions.

Live to neutral resistance test in each part of the installation. Final sub-circuits shall be test separately from sub-main.

- iii) Earth continuity tests shall be carried out be means of a live-earth loop tester or natural-earth loop tester.
- iv) Phase rotation tests shall be carried out to ensure the phase sequence are correct.
- v) Earth electrode resistance test shall be carried out in accordance with 16th edition of I.E.E. Wiring Regulations.
- vi) Test involving of earth leakage relay, over-current relay, shunt trip, current transformers and voltage transformers. All these tests shall be factory-tested and witnessed by the M&E Consultant. Site test may be required after the switchboard cubicle has been delivered to switch room. Comprehensive test report shall be submitted for final approval by M&E Consultant.

SCHEDULE OF RATES

Project : Minor Works at G/F, GT (Ellen Yeung) College

ltem No.	Description	Quantity	Unit	Unit Rate	Amount (\$)	
1.0	Preliminaries					
1.1	Provide Contractor all risk, Employee's Compensation and third party insurance etc.		sum			
1.2	Provide Surety Bond in the amount of 10% of Contract Sum		sum			
1.3	 General cleaning & cart away rubbish, debris etc during progress of work and after full completion 		sum			
	b) Final cleaning		sum			
1.4	Site setting out, site management, site safety, site office, if required etc.		sum			
1.5	Allow for necessary statutory fee & charges according to the current regulation of HKSAR		sum			
1.6	Provide Site Facility a) Temporary electricity b) Temporary water supply		sum			
1.7	Preparation of material sample board, mockup, photo record, shop drawings and as-fitted drawings		sum			
Note: if the Contractor does not price any Preliminaries, the cost therein will deem to be included in various items throughout the Schedule of Rates.						
Total Carried to Summary of Tender						

Project : Minor Works at G/F, GT (Ellen Yeung) College

ltem No.	Description	Quantity	m No. Description Quantity Unit Unit Rate Amount (\$						
2.0	Preambles								
2.1	The Contractor's price shall be a lump sum conformity with the Drawings and Spec measured by the Tenderer at his own ri Tenderer's reference only. The Tenderer additional items so as to reasonably repu descriptions should be deemed to be indic the Drawings and Specification for the de In case of Discrepancies, the more one deemed to have been allowed for in the u	n for the carr ification. Th isk. The Sch r may ame resent a bu cative only c tailed mater erous requir unit rates.	ying out o e items edule of end the ild-up of ind shall l rials, cons rements	of the whole and quanti Rates is pr item descri the Tender be read in c struction and shall prevail	of the Works in ties are to be ovided for the iptions or add Sum. The item onjunction with d workmanship. I and shall be				
2.2	The quality and quantity of the work included in the sum of this Schedule shall be that which is shown on the Drawings and/or described in the Specification insofar as such Drawings and/or Specification may apply to the Works. The Contractor shall allow for any items which in the opinion of the Contractor are required for the Works but which nonetheless do not appear on the Drawings and/or Specification. Any work forming part of the Works which has not been measured or allowed for in the preparation of the quantities and unit rates shall not be recoverable by the Contractor as a Variation nor as an Extension of Time.								
2.3	The Tenderer may insert any additional items in the Schedule of Rates, as required by him in order to complete the whole of the Works in accordance with the Drawings and Specification.								
2.4	The amount/unit rates inserted in the Schedule of Rates shall be held to include for all-in-plant, labour, material costs, profit and overheads necessary for the completion of the Works.								
2.5	The unit rates inserted in the Schedule of Re and calculating interim valuations.	ates shall be	used as	a basis of pr	icing Variations				
2.6	Quantities marked 'PROVISIONAL' shall be carried out on the instruction of the Archite	omitted an	d substitu dance wi	uted by the the the Contr	net quantity as act.				
2.7	The rates and prices inserted in the Scheo following works, duties. Liabilities and e separately itemized or specifically referred	dules shall be xpenses of to in the Sch	e deeme the Cor nedules c	d to include htractor whe or not:-	e, inter alia, the ether they are				
 (i) All design (to the extent as required under the Contract) and development the completion of the Works (ii) All works and services necessary for the Works which shall encompass the of the extent as required under the Contract), development, manufacture, contesting, supply, installation, protection and maintenance. 									
							(iii) Labour and all cost in connection the	erewith.	
	(iv) The supply of materials, goods, sto including off site storage waste, delivery t the like.	orage, and o Site, multi	all cost -handling	s in connec g, return of p	ction therewith backaging and				

Project : Minor Works at G/F, GT (Ellen Yeung) College

ltem No.	Description	Quantity	Unit	Unit Rate	Amount (\$)			
2.7 (cont'd)	(V) Sampling and testing of materials, good and workmanship and all costs on connection therewith, as required or deemed necessary by the Employer's Representative.							
	(vi) Plant and tools and all costs in conne	ction therev	vith.					
	(vii) Fixing, erecting and installing or placi	ng of materi	als and g	goods in pos	ition.			
2.8	Any items in the Schedule of Rates, if considered by the Contractor, is not applicable, he should insert "NIL" in the amount column.							
2.9	All dimensions stated in this Schedule are approximate only. Tenderer should visit the Site and satisfy themselves with the actual dimensions before submitting their tenders. No claim whatsoever will been entertained should there by any discrepancy between the dimensions described in this Schedule and the dimensions actually measured on Site.							
2.10	Allow							
	Whenever the term "allow" occurs in the description of items in this schedule, the rates for these items shall be at the risk of the Contractor and no adjustment will be made at the settlement of accounts. In the absence of any price against such items, the cost shall be deemed to be included on the rates contained in the Schedule hereafter following.							
2.11	Making good							
	Whenever the term "making good' is included in the description of items in this Schedule, the rates for these items are deemed to include all labour and materials necessary to bring the disturbed area to the same face, colour, texture etc., in the same materials as the surrounding works, and shall include for painting, colouring and/ or varnishing any new work to match the surrounding existing work to the entire satisfaction of the Architect.							
2.12	<u>As described</u>							
	The term "as described" included in desc materials and workmanship described in Preambles.	riptions cont the relevar	tained in nt Specifi	this Sched ication Cla	ule refers to the uses and in the			
2.13	Proprietary Articles and Brand Names							
	Where phrases such as " or approved equal" or "other approved" or "other equal and approved" or similar phrases follow proprietary articles or brand names in the Specification and/or Drawings, such phrases are deemed to be included in the relevant descriptions in the pro-forma Schedule of Rates and the Rates and the Summary of Tender.							
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Project : Minor Works at G/F, GT (Ellen Yeung) College

Tender Document

ltem No.	Description	Quantity	Unit	Unit Rate	Amount (\$)			
3.0	Demolition works							
3.1	Take down and set aside existing affected ceiling lighting and other equipment, speakers, etc.		sum					
3.2	Take down and cart away existing built-in fittings, conduits & trunking, etc. from the affected wall/ columns		sum					
3.3	Demolish/take down and cart away existing movable partition and hanging frame, doors, etc.		m2					
3.4	Chip off existing damaged internal wall finishes ,i.e. loosen or peeled paint only and keep existing rendering untouched		m2					
3.5	Remove/ scrape existing floor finishes outside rooms, i.e. 100 x100 artificial granite tile and c/s screed down to concrete slab surface		m2					
3.6	Additional items required by tenderer to be inserted here:							
	Total Carried to Summary of Tender							

4.0	Partition walls			
4.1	Supply and install 100mm thk. block wall partitions on wall of modified multi-purpose rooms	m2		
4.2	Additional items required by tenderer to be inserted here:			

Project : Minor Works at G/F, GT (Ellen Yeung) College

Tender Document

ltem No.	Description	Quantity	Unit	Unit Rate	Amount (\$)		
5.0	Ceiling finishes						
5.1	Supply and install moisture proof gypsum board bulkhead ceiling finished with two coats of low VOC emulsion paint (matt white colour) on skim coat, completed with GMS support frame/ bracket/ screw rod and all necessary accessories		m2				
5.2	Allow for access/ inspection panels						
	- 1 no. of 1000mm (L) x 550mm (W)		no.				
	- 1 no. of 450mm (L) x 450mm (W)		no.				
5.3	Supply and apply 2 finishing coats on 1 undercoat of low VOC emulsion paint system (matt white colour)on existing plaster with touch up at ceiling soffit		m2				
5.4	Supply and install 50x100 baffle ceiling of same size and same type at the portion to be modified to replace minimum baffles to match existing						
5.5	Additional items required by tenderer to be inserted here:						
	Total Carried to Summary of Tender						

Project : Minor Works at G/F, GT (Ellen Yeung) College

Tender Document

ltem No.	Description	Quantity	Unit	Unit Rate	Amount (\$)		
6.0	Wall finishes						
6.1	Supply and install around 68mm thk. dry wall panel with 25mm (W) x 15mm (D) timber strip @ 25mm spacing at the portion to be modified on one existing circular column in the Rooms		m2				
6.2	Supply and apply 15mm thk. cement sand (1:3) plaster to new walls in the Rooms		m2				
6.3	Supply and apply low VOC emulsion paint with one undercoat and two finishing coats on interior wall surfaces of new walls in the Rooms		m2				
6.4	Supply and apply Polyurethane (PU) paint with one undercoat and two finishing coats on the exterior side of the new walls of the Rooms		m2				
	<u>Skirting</u>						
6.5	Supply and install 12mm thk. hardwood board up to 100mm (H) finished with two coats of lacquer to form skirting on interior sides of new existing walls in the Rooms		m				
6.6	Supply and apply 12mm thk. rubbed grano up to 100mm (H) to form skirting on the exterior of the new walls of the Multi-purpose Rooms		m				
6.7	Additional items required by tenderer to be inserted here:						
	Total Carried to Summary of Tender						

Project : Minor Works at G/F, GT (Ellen Yeung) College

Tender Document

ltem No.	Description	Quantity	Unit	Unit Rate	Amount (\$)	
7.0	Floor finishes					
7.1	Supply and apply around 10mm thk. proprietary self levelling screed to form a smooth and levelled substrate for vinyl flooring at the modified portion		m2			
7.2	Supply and install at least 2mm thk. heavy duty homogeneous vinyl sheet flooring with PU reinforcement at the modified portion		m2			
7.3	Additional items required by tenderer to be inserted here:					
	Total Carried to Summary of Tender					

8.0	Doors and ironmongery			
8.1	Supply and install 50mm solid core flush doors finished with laminated plastic sheet both sides, including paint finished hardwood frame, ironmongery & signage D1a - 950mm (W) x 2125mm (H) with vision panels and with a fixed panel 950mm (W) x 200mm (H) finished with laminated plastic sheet both sides	no.		
8.2	Additional items required by tenderer to be inserted here:			

Project : Minor Works at G/F, GT (Ellen Yeung) College

Tender Document

ltem No.	Description	Quantity	Unit	Unit Rate	Amount (\$)
9.0	Electrical and ELV installation				
9.1	Supply and install the lighting system, including G.I. conduit/wiring/trunking switch accessories, etc.				
9.1.1	Around 1500mm (L1) suspended linear fluorescent luminaire fitting c/w 1x26W 1500mm LED tube of 5000K/ 6000K colour temperature, electronic ballast, diffuser and all necessary accessories, at 3000mm level (PC Rate HK\$1600 /no.)		no.		
	1 no. of this type c/w 3 hours self contained battery		no.		
9.1.2	Around 1x13W 1500mm (L2) concealed linear luminaire c/w 1x13W LED tube of 5000K/ 6000K colour temperature, 10mm thk. acrylic sheet translucent milky white colour and all necessary accessories, at the upper bulkhead at 2800mm level (PC Rate HK\$800 /no.)		no.		
9.2	Supply and install the power supply point, including G.I. conduit/ proprietary non-metallic cable dado trunking and wiring				
9.2.1	13A twin switched socket		no.		
9.2.2	13A fuse spur unit with switch & pilot light				
	On wall trunking		no.		
	On ceiling		no.		
9.3	Testing and commissioning		sum		
9.4	Provide and complete test report and issue Certificate WR1		sum		
9.5	To provide shop drawing, as fitted drawing and O&M manual		sum		
9.6	Additional items required by tenderer to be inserted here:				

Project : Minor Works at G/F, GT (Ellen Yeung) College

ltem No.	Description	Quantity	Unit	Unit Rate	Amount (\$)
10.0	Contingencies				
10.1	Allow provisional sum for contingencies for items to be expended as directed by the Architect or wholly deducted, if required		sum		30,000
Total Carried to Summary of Tender					

SUMMARY OF TENDER

Project : Minor Works at G/F, GT (Ellen Yeung) College

Summary of Tender					
<u>ltem</u>	Description		<u>Total in HK\$</u>		
1.0	Preliminaries	HK\$			
2.0	Preambles	HK\$			
3.0	Demolition works	HK\$			
4.0	Partition walls	HK\$			
5.0	Ceiling finishes	HK\$			
6.0	Wall finishes	HK\$			
7.0	Floor finishes	HK\$			
8.0	Doors & ironmongery	HK\$			
9.0	Electrical & ELV installation	HK\$			
10.0	Contingencies	HK\$			
	Total:	HK\$	30,000.00		

Tender submitted by:					
Name of Tenderer:					
Address:					
	Telephone:	Fax:			
(Authorized Signature With Company Chop)					
Date:					

LIST OF DRAWINGS
<u> Project No.: 61054B</u>

Project : Minor Works at G/F, G.T. (Ellen Yeung) College

DRAWING LIST

DRAWING NO.	DESCRIPTION	SCALE	REVISION
	COMPONENTS ASSEMBLY		
CA102	FINISHING SCHEDULE	AS SHOWN	-
CA203	DOOR SCHEDULE	AS SHOWN	
	GENERAL LAYOUT		
GP203	GENERAL FLOOR PLAN OF MULTI-PURPOSE ROOMS 1&2 ON G/F	1 : 100	-
GP302	INTERIOR ELEVATIONS & SECTION OF MULTI-PURPOSE ROOMS 1&2 ON G/F	1 : 100	-
GP303	PART ELEVATION OF MULTI-PURPOSE ROOMS 1&2 ON G/F	1 : 100	
CP102	CEILING PLAN WITH LIGHTING LAYOUT AT MULTI-PURPOSE ROOMS 1&2 ON G/F	1 : 100	-
	BUILDING SERVICES		
EL102	ELECTRICAL LAYOUT PLAN OF MULTI-PURPOSE ROOMS 1&2 ON G/F	1 : 100	-